

Report type:	Phase 1 Site Condition Report
Site:	Unilever Ltd, Burton-Upon Trent
Client:	Unilever Ltd, Burton-Upon Trent
Ref:	GRM/P5495/SC1
Date:	June 2011
EA Ref:	SP3231KA

Phase 1 Site Condition Report for
Unilever, Burton-Upon-Trent

SUMMARY OF RECOMMENDATIONS

Where further assessment is required it is indicated with a "Y" in the right hand column		
Operation	Biogas plant	
ENVIRONMENTAL ASSESSMENT		
Site Workers	Site laid with hardstanding. HSE guidance to deal with operational chemicals.	
Groundwater	Site laid with hardstanding. Site drainage to deal with effluent.	
Surface Water	No risk to local surface watercourses.	
Conclusions.	Low environmental risk.	

This summary is based on the full report that provides the detailed assessment of the ground risks affecting the development and how to manage them. It should not be used in isolation.

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Historical Site Investigation Data
Historical OS Maps
Environmental Data Summary
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1 INTRODUCTION

1.1 PREAMBLE

GRM Development Solutions Limited (GRM) have been appointed by Helen Theaker (Environmental Technologist) (Client's representative) on behalf of Unilever Ltd (Client) to compile a Phase 1 Site Condition Report for a biogas plant located within the Unilever Factory site in Burton-upon-Trent.

The report is required by the Environment Agency for a retrospective application for an environmental permit relating to an Anaerobic Digestion Plant (waste operation) and an 'Installation' (burning biogas). For ease of reporting, the term 'biogas plant' will be used within the report in reference to the waste operation and installation..

A desk study report and site inspection form Phase I of the report and are combined with the Environment Agency's Site Condition Report Template (ref. H5 SCR) to produce the Phase 1 Site Condition Report.

1.2 OBJECTIVES OF THE SITE CONDITION REPORT

The principal aims of the Site Condition Report are as follows:

- a) Obtain information, from easily accessible sources, about the soil and groundwater conditions within the area of the site.
- b) Determine potential ground related contamination hazards within the site boundaries that may affect the site condition.

1.3 INFORMATION SOURCES

The following sources have been used for the identification and assessment of potential ground hazards:

- Relevant British Standards
- British Geological Survey (BGS) Geology Map Scale 1:50,000 Sheet 141 Loughborough.
- Historical Ordnance Survey (OS) Maps
- Environmental Data Supplier (report from Emapsite)
- Environment Agency Website: <http://www.environment-agency.gov.uk/>
- A previous borehole investigation by GRM, dated 30th November 2010, ref GRM/P5341)
- DEFRA/Environment Agency Contaminated Land publications and DoE Industry Profiles
- Client supplied information including: the location of the site, operational drawings, site specific operational information.

Other technical references used throughout this document are detailed in the text.

2 SITE DETAILS

Name of the Applicant	Unilever UK Ltd Burton on Trent
Activity address	Wellington Road, Burton on Trent, DE14 2AB
National Grid Reference	SK 23454 22683
Document reference and dates for Site Condition Report - at permit application - at surrender	GRM/P5495/SC1 Application: JUNE 2010 At surrender: N/A
Document references for site plans (including location and boundaries)	Appendix A: Site with installation boundary marked Appendix A: Site with surrounding sites and boundaries shown

2.1 SITE DESCRIPTION

The Unilever site is situated in an industrial area approximately 1km south-east of the centre of Burton on Trent, Staffordshire. The Biogas plant is located in the western section of the Unilever Site which is bounded to the north by the Coors brewery site, with the Trent and Mersey canal and Shobnall marina beyond; to the north-east by offices and large retail stores and to the north-west by a number of retail distribution warehouses and offices. The north-western and northern site boundaries are formed by a brook (partially dry for some months of the year). Further west is the Trent and Mersey canal. A disused steel manufacturer's fabrication site is located to the south-west of the site and a petrol station, self-storage warehouses and retail car sales unit are located to the south-east of the site.

The Unilever site as a whole extends to approximately 6.59 hectares, of which 3.72 hectares is covered with buildings. The site itself is relatively flat and houses a mixture of open yards, processing plant, warehousing, offices, car parking, workshops and the bio-gas plant.

2.2 PROCESS DETAILS

A site inspection was conducted by GRM on 13th May 2011. The installation is set up to burn the biogas produced by the on-site waste water treatment plant (WWTP), which is currently disposed of by flaring. The installation consists of the conditioning tank, from which the biogas originates, the biogas treatment area, the boiler house and the piping to connect the three facilities.

The WWTP was commissioned in 2008 and has been in continuous use since May 2009. It currently produces on average 2100m³ biogas/day but has capacity to produce 7350 m³ biogas/day (depending on the concentration and throughput of the waste it processes). The Waste Operation contains both Anaerobic and Aerobic reactors. It currently processes 250m³ of effluent from the food factory per day, but has the capacity to process 600m³ per day. The average COD reduction is 98%. The WWTP is operated by 4 people, all part-time, two operators from the Site Services

department, a contractor, and an Environmental Technologist from the Quality, Health, Safety and Environment (QSHE) department.

The biogas treatment area contains a flare, a scrubber (which removes hydrogen sulphide), a gas pressurizing unit, and a drier (which removes moisture from the gas). The flare is located upstream of the bio-gas plant, so any gas that is flared will not be treated.

There are three boilers in the boiler house, which were all installed in 1991. Boilers 2 and 3 (only) have been fitted with burners that are suitable for burning biogas. The boilers undergo a thorough NDT (non-destructive test) every 5 years, a safety service every year, a maintenance service monthly and an evaporation test weekly. The layout of the biogas plant is illustrated on the plan contained in Appendix A.

The Unilever site obtained ISO 14001 in 2005 and operates an integrated management system, which is periodically audited by SGS UK Ltd.

3 CONDITION OF THE LAND AT PERMIT ISSUE

<p>Environmental setting including:</p> <ul style="list-style-type: none"> • Geology • Hydrogeology • Surface Waters 	<p>River Terrace Deposits underlain by Mercia Mudstone Solid Strata.</p> <p>River Terrace Deposits classified by the EA as a Secondary A Aquifer. Mercia Mudstone as a Secondary B aquifer.</p> <p>SPZ Inner Zone Located on site.</p> <p>Brook to the north of the site; Canal further north; River Trent 1.5km west of the site.</p>
<p>Pollution history including:</p> <ul style="list-style-type: none"> • Pollution incidents that may have affected land • Historical land-uses and associated contaminants • Any visual/olfactory evidence of existing contamination • Evidence of damage to pollution prevention measures 	<p>See sections 3.6 and 3.9.</p>
<p>Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)</p>	<p>GRM borehole drilled on site in November 2010. Analysis of two solid samples reported no significant contamination.</p> <p>No groundwater sample taken from the borehole (now backfilled). Data from on-site boreholes in Appendix B.</p>
<p>Baseline soil and groundwater reference data</p>	<p>Borehole log and analysis results contained in Appendix B</p>
<p>Supporting information</p>	<ul style="list-style-type: none"> • Phase 1 Site Condition Report

3.1 HISTORICAL DEVELOPMENT OF THE SITE

A review of the available historical Ordnance Survey (OS) maps gives an insight into the development of the site and can highlight potential hazards. Extracts of the maps reviewed are provided in Appendix C. Relevant differences between each edition are highlighted below.

1884: The earliest map reviewed shows the site located within an agricultural field, which is bisected by a farm track leading to Ordish's Farm to the south of the site. A *Sand Pit* is illustrated to the immediate west of the site; a brook flows west to east approximately 20m north of the site and railway sidings and malhouses are located 100m further north. Residential and industrial areas of Burton-upon-Trent are illustrated approximately 600m north and east of the site.

1901: A *Malthouse* is located to the immediate south of the site, associated railway sidings run through the site to the north. The *Sand Pit* to the west of the site is no longer illustrated; a *Gravel Pit* is illustrated 50m to the north of the site. The number of sidings to the north of the site has increased.

1923: A *Pumping Station* is located to the south west of the site and an increased number of sidings run across the site. The *Gravel Pit* has extended to the south-east of the site. *Allotment Gardens* are located on land 50m north-west of the site whilst increased residential and industrial development is evident to the north and east.

1937: No change to the site.

1949-50: No change to the site. The southern section of the neighbouring gravel pit is identified as a *Refuse Heap*. *Ordish's Farm* is now *Shobnall Farm* (with a tank). An *Engineering Works* is located 200m east of the site.

1964: No sidings are illustrated on site. A *Food Factory* and *Depot* have been constructed on land along Wellington Road to the east of the site.

1973: No change to the site. A *Waste Tip* is illustrated on the allotments to the north west of the site. Tanks and additional structures are located to the north of the site.

1992: No change to the site.

2002: No change on site. *Warehouses/Depots* have been constructed on Shobnall Farm land to the south and west of the site.

2011: Tanks are illustrated to the east of the site. A commercial unit has been constructed to the west of the site.

The hazards identified are summarised in the table below.

Significant Features identified on OS Maps:
Historical sand and gravel extraction and landfilling. Local industrial land use.

3.2 ANTICIPATED GEOLOGY

The BGS Geological Sheet for this area shows superficial deposits of the Holme Pierrepont Sand and gravel member over a solid geology of the Mercia Mudstone Group.

The log for the borehole advanced on site by GRM in October 2010 (Appendix B) reports the following geological sequence:

Made Ground: Concrete, sub-base and sandy clay with gravel of brick and quartzite to 0.65mbgl.

River Terrace Deposits: Silty fine to coarse sand and gravel from 0.65 – 7.75mbgl.

Mercia Mudstone: Medium dense very clayey fine to coarse sand from 7.75 – 7.9mbgl.
Very stiff slightly silty clay from 7.9 – 8.7mbgl.
Weak slightly weathered Mercia Mudstone from 8.7 – 9.2mbgl

3.3 HYDROGEOLOGICAL INFORMATION

The underlying superficial strata (sand and gravels) have been classified by the Environment Agency as a secondary A aquifer; the underlying solid strata is classified as a secondary B aquifer.

Information from the GRM borehole log reports wet soils from 1.5mbgl, consistent with reported groundwater levels in the range 1.5 – 2.2mbgl across Burton-upon-Trent. Groundwater flow is likely to be towards the north-east.

There are two groundwater abstraction licenses within the Unilever site:

- 329.7m depth. Licence ref.3/28/24/79/G (19 May 1969). Max quantity of water = 199,114m³/year.
- 9m depth. Licence ref 3/28/24/94/G (6 July 1982). Max quantity of water 420,480 m³/year.

A further 6 abstractions are located within 250m of the site. The primary uses include cooling and evaporation and process waters. The site is recorded to be located in the inner zone (Z1) of Source Protection Zones (SPZ) relating to the on-site boreholes.

Water quality data from the on-site borehole is contained in Appendix B. This information does not, however, provide an indication of concentrations of typical brownfield contamination.

3.4 HYDROLOGICAL INFORMATION

Local surface water features include:

- A partially culverted brook flowing along the eastern site boundary and under the Unilever site to the north.
- Trent and Mersey Canal to the west of the site.
- River Trent to the west of the site.

Although the site is within 250m of zone 2 and 3 indicative fluvial floodplains (see Appendix D), the locality benefits from flood barrier protection.

There are no surface water abstraction licenses within 500m of the site.

3.5 MINERAL RESOURCES

The site is not located within an area at risk of instability due to historical coal mining.

A number of gravel/sand pits were illustrated within 100m on the site on the historical mapping.

3.6 ENVIRONMENTAL INFORMATION

Environmental information has been acquired from Emapsite. There is a considerable amount of data and not all of it is relevant to this appraisal. Therefore, summary

sheets are presented in Appendix D, along with copies of data sheets relevant to this report. The full set of data will be held on file by GRM.

A summary of the relevant information not included elsewhere in this report is presented below:

- No operational landfills within 500m; 5 local authority landfill sites within 250m.
- Pollution Incidents to Controlled Waters.
- 1 Registered Waste Treatment Site.
- 1 licensed discharge consent within 250m.
- 4 recorded pollution event within 250m (fumes/dust).
- 4 radioactive substance consents within 250m.
- 11 IPC permits within 250m.
- Notification of Installations Handling Hazardous Substances
- 17 Industrial uses within 250m (e.g. factories, tyre retail, tanks, sub str, vehicle retail).
- 1 Fuel Station within 250m.

3.7 INVASIVE PLANT SPECIES/ECOLOGY

Ecological issues can have a significant effect on developments. GRM is not a specialist in this topic and has not conducted such a survey. However, GRM endeavour to report easily recognisable issues such as Japanese Knotweed, Giant Hogweed, badger sets etc, when seen on site. None were recorded during the site visit.

3.8 RADON ASSESSMENT

The site is not located within an area where radon protection is required for new development.

3.9 CONTAMINANTS OF CONCERN

The site is located within a food factory and, since the late 1800's, has been crossed by railway sidings and bounded by backfilled gravel pits. Accordingly, should an intrusive Phase 2 investigation be required, there are contaminants that are generally tested for as a matter of course as their prevalence on brownfield sites is renowned.

Contaminants include:

- Arsenic
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium
- Copper
- Nickel
- Zinc
- Phenols
- cyanide (total)
- pH
- Water soluble sulphate
- PAH (polycyclic aromatic hydrocarbons)
- PCB

As there are no enclosed office spaces within the plant, the potential risk posed by landfill gas is considered negligible. Therefore no monitoring for methane and carbon dioxide is required.

With respect to the operation of the plant, MSDS certificates have been supplied for chemicals and lubricants used on site. Materials Safety Data Sheets (MSDS) are contained in Appendix E; the products are summarised below:

- Hydrovane Fluid Force – Compressor lubricant oil.
- Dispelair – Foam control agent (kerosene/mineral oil).
- Drewfloc – Polymer (Petroleum distillates, Ethoxylated Alcohols).
- Hydrochloric Acid
- Nutromex N – Urea and Ammonium Nitrate (30% N).
- Sodium Chloride (Salt).
- Sodium Hydroxide.
- Vithane – Sulphuric acid, Aluminium salt, Octadecahydrate, Zinc Chloride, Manganese, Sulphate, Monohydrate.
- Divosan Hypochlorite – Sodium Hypochlorite.
- Ferric Chloride.
- Genesol 38 – Aqueous solution of polycarboxylic acid.
- Genesys LF – aqueous solutions of neutralised phosphonic acid.

4 PHASE I CONCEPTUAL MODEL

4.1 POTENTIAL SOURCE – PATHWAY – RECEPTOR

The consideration of contamination is based upon the principles of risk assessment, using the 'source-pathway-receptor' model in order to establish the presence, or potential presence, of a pollutant linkage.

To create a risk, contamination must have the potential to cause harm to susceptible targets or receptors such as humans, the water environment or the built environment. The potential for harm to occur requires three conditions to be satisfied:

- The presence of substances that may cause harm (SOURCE).
- The presence of a target which may be harmed (RECEPTOR).
- The existence of a plausible pollutant linkage between the source and the receptor (PATHWAY).

In the absence of a plausible pollutant linkage there is no risk. Where a potential linkage is identified in order for it not to pose a risk to the identified receptor(s) it must be broken.

The site currently houses a bio-gas plant, which recycles waste from the food processes to power the on-site boilers. Run-off is collected within a drainage system, which connects to that laid across the site, the on-site water effluent treatment works and foul sewers.

The site was historically an agricultural field which then housed a number of railway sidings as commercial (brewing) operations expanded in Burton-upon-Trent. The site has, since the removal of the sidings in the 1960's, formed part of a food factory (yard area to the rear of the works).

Historical sand and gravel extractions surrounding the site have been partially backfilled with refuse. Potential contaminants of concern for the whole site include those listed in Section 3.9.

The primary human health receptors are staff on site. The site is laid with concrete, as are the surrounding yard areas. For the operational site, the primary pathways of concern include dermal contact, ingestion and inhalation with operational chemicals. However, adherence to health and safety guidance will reduce such risks to negligible levels.

Ground gas is not considered to pose a risk to the site.

For controlled waters, the primary receptor for the site is the underlying Secondary A aquifer and on site boreholes (Source Protection Zone). The primary pathways of concern are leaching of contaminants and vertical migration to the groundwater. The presence of site drainage and hardstanding cover significantly reduces the risk posed to controlled waters.


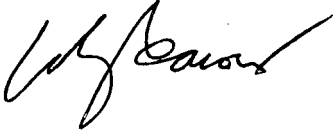
The pollutant linkage model is illustrated in detail on the following page.

4.2 POLLUTANT LINKAGE MODEL

HUMAN HEALTH			
Source	Pathway	Receptor	Solution
<p>Historical site use includes railways agriculture and sidings.</p> <p>Operational chemical use.</p> <p>Potential ground gases (methane/ carbon dioxide) from neighbouring historical pits.</p>	<p>The inhalation and ingestion of, and dermal contact with, operational chemicals.</p>	<p>Unilever Staff</p>	<p>Health and safety guidance to deal with operational chemical use.</p> <p>Site laid with concrete hardstanding.</p> <p>No gas risk posed to installations.</p>
CONTROLLED WATERS			
<p>Historical site use includes railways agriculture and sidings.</p> <p>Operational chemical use.</p> <p>Petrol station with USTs and above ground waste oil tank.</p>	<p>Leaching of contaminants and vertical migration to the groundwater.</p>	<p>Secondary A aquifer</p>	<p>All surface run-off and effluent contained within site drainage to treatment plant or foul sewer.</p>

5 CONCLUSIONS

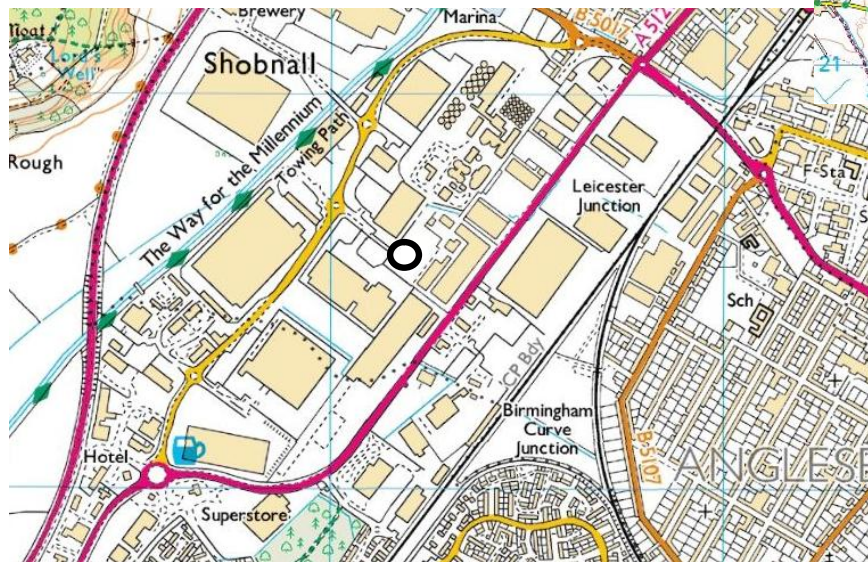
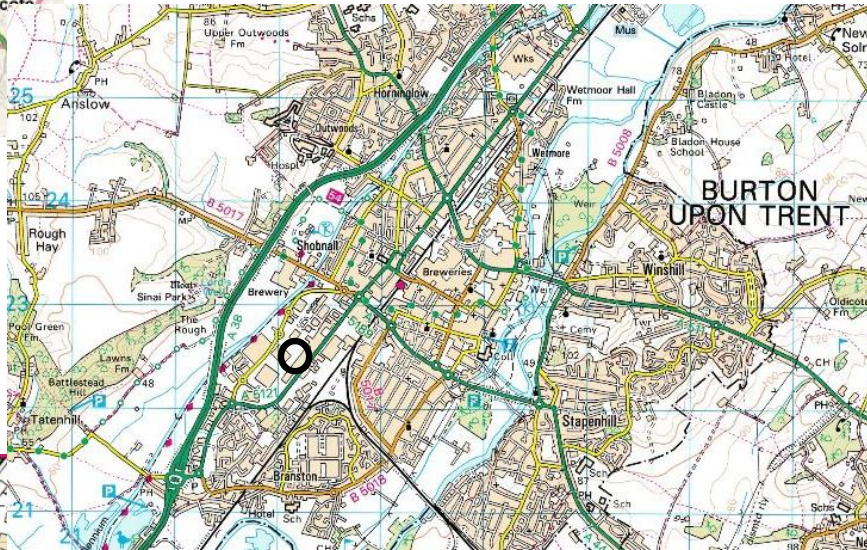
The Phase 1 Site Condition report has shown the operation of the biogas plant does not pose an unacceptable environmental risk to identified receptors.

Prepared by	 R P Sutton MRICS <i>(Principal Environmental Consultant)</i>
Reviewed & Approved by	 Dr W S Peacock FGS CGeol <i>(Director)</i>
When required in-house geological, geotechnical, environmental, structural and civil staff helped to produce this document.	

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DO NOT SCALE

NOTES:

Approximate Site Location



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CLIENT:

Unilever

PROJECT:

**Biogas Plant,
 Burton-upon-Trent**

TITLE:

Site Location

SCALE@SIZE :

NTS

ISSUE:

1

DESIGN/DRAWN :

RPS

DATE:

05/11

PROJECT No:

P5495

DRAWING No:

Figure 1

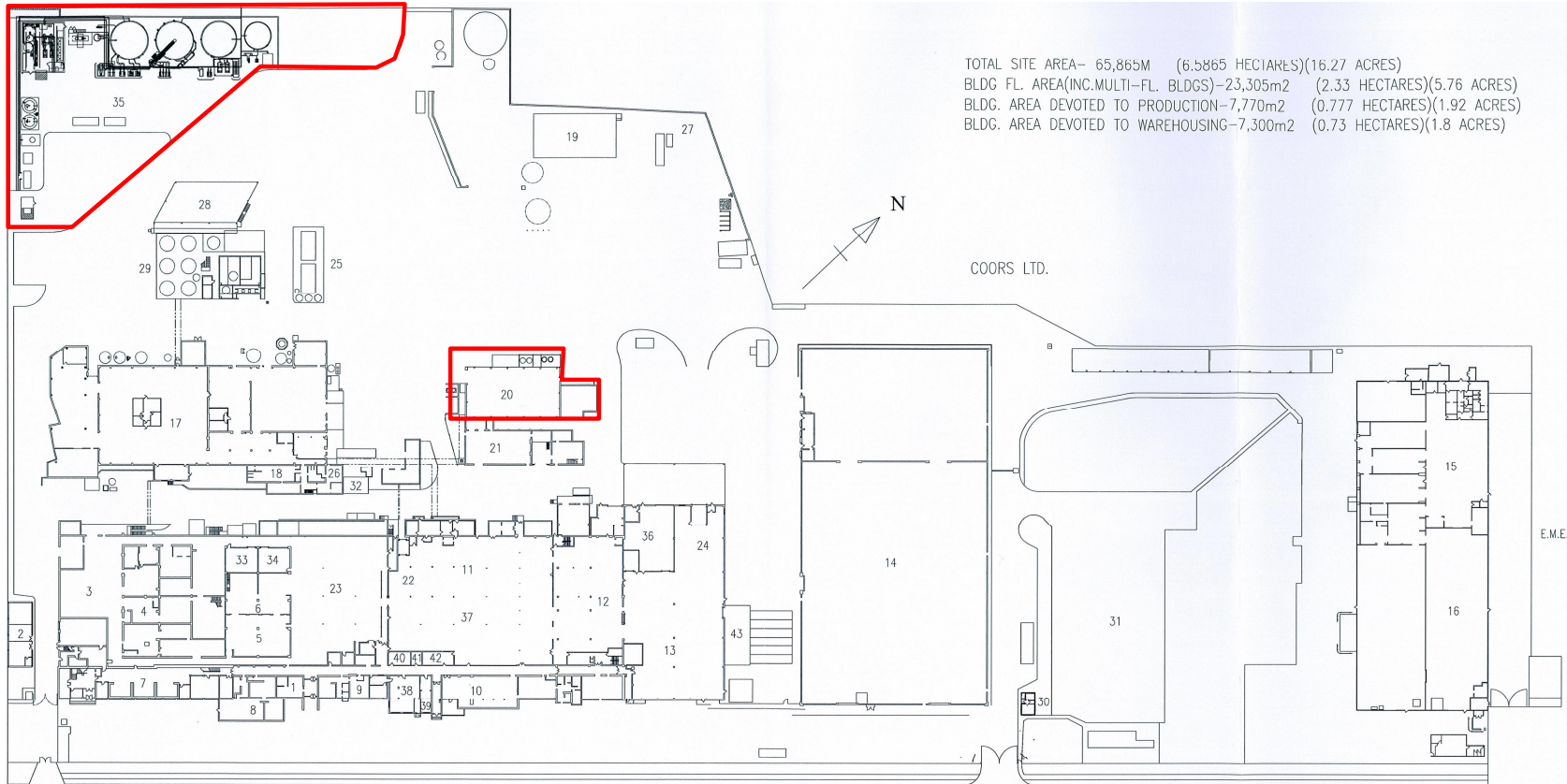
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DO NOT SCALE

NOTES:

Application Installations



TOTAL SITE AREA- 65,865M (6.5865 HECTARES)(16.27 ACRES)
BLDG FL. AREA(INC.MULTI-FL. BLDGS)-23,305m2 (2.33 HECTARES)(5.76 ACRES)
BLDG. AREA DEVOTED TO PRODUCTION-7,770m2 (0.777 HECTARES)(1.92 ACRES)
BLDG. AREA DEVOTED TO WAREHOUSING-7,300m2 (0.73 HECTARES)(1.8 ACRES)

SITE PLAN KEY

- | | | | | |
|---------------------------------|--------------------------------------|--------------------------------------|-------------------------------|--------------------------|
| 1 RECEPTION | 11 EXISTING PASTE FILLING LINE | 21 FITTING SHOP | 31 CAR PARK | 41 OPREATOR MEETING ROOM |
| 2 EFFLUENT HOUSE | 12 MIX & BLEND OVER NEW FILLING LINE | 22 TECHNICAL DEPT OVER PASTE FILLING | 32 WATER TOWER | 42 OPERATORS OFFICE |
| 3 No 1 WAREHOUSE | 13 PALLETISING & DEPAL | 23 LABEL STORE | 33 ENGINEERING STORES | 43 HEAT TREATMENT PLANT |
| 4 DRIED PRODUCTS AREA | 14 No 4 WAREHOUSE | 24 No.3 WAREHOUSE | 34 ENGINEERING WORKSHOP | |
| 5 CUBING & WRAPPING | 15 F.S. DRY (REDUNDANT) | 25 COOLING TOWER | 35 NEW EFFLUENT PLANT | |
| 6 CUBE PACKAGING | 16 No. 5 WAREHOUSE | 26 TRANSPORT OFFICES | 36 BOVRIL MIXING | |
| 7 Q.C. LABS/OFFICES OVER | 17 EXTRACT FACTORY | 27 WASTE DISPOSAL AREA | 37 NEW PASTE FILLING LINE | |
| 8 MALE CLOAKROOM | 18 EXTRACT FACTORY PERSONNEL BLOCK | 28 TANKER CANOPY | 38 NEW SITE SUPPORT OFFICE | |
| 9 FEMALE CLOAKS/PERSONNEL | 19 SITE SERVICES FACILITY | 29 COPPERS | 39 OCCUPATIONAL HEALTH CENTRE | |
| 10 WORKS/STAFF CANTEENS/KITCHEN | 20 BOILER HOUSE | 30 SECURITY | 40 VISITOR CHANGING ROOM | |

CLIENT:

Unilever

PROJECT:

Biogas Plant,
Burton-upon-Trent

TITLE:

Installations

SCALE@SIZE :

NTS

ISSUE:

1

DESIGN/DRAWN :

RPS

DATE:

05/11

PROJECT No:

P5495

DRAWING No:

Figure 2

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B**





Burton-on-Trent (HQ) Tel: 01283 551249
 Market Harborough Tel: 01858 414981
 Email: mail@grm-uk.com Web: www.grm-uk.com

Cable-Percussion Borehole

Borehole Number

BH1

Site **Marmite**

GRM Project ref: **P5341**

Ground Level mAOD
-

Client **Unilever PLC**

Equipment: **Pilcon**

Coordinates:
0.00E
0.00N

Crew: **DFoxwell Drilling** **Logger: NR/DF**

GROUNDWATER		SAMPLES	INSITU TESTING			STRATA RECORD				Scale: 1:75
Installation/Backfill	Depth (m)	Depth/Type/Ref (m)	Depth/Type (m)	N Value (Sample Blows)	Casing Depth (m)	Depth (m)	Level (mAOD)	Key	Description	
▽		0.40/D/1 0.50/D/2 0.80/D/3				0.23 0.38 0.46 0.65			Concrete.(MADE GROUND)	
	1	1.00-1.50/B/5 1.05/C/4	1.05 C	N=40 (3,7,7,10,11,12)					Subbase.(MADE GROUND)	
	2	1.90/D/6 2.00-2.50/B/8 2.05/C/7	2.05 C	N=27 (2,4,5,6,7,9)					Soft dark brown and black sandy clay with occasional fine to coarse angular to subrounded gravel including brick and quartzite.(MADE GROUND)	
	3	2.90/D/9 3.00/C/10 3.00-3.50/B/11	3.00 C	N=28 (3,5,5,7,7,9)					Firm grey very sandy clay with some fine to coarse subrounded gravel of quartzite.(MADE GROUND)	
	4	3.90/D/12 4.00/C/13 4.00-4.50/C/14	4.00 C	N=28 (3,4,4,6,8,10)					Medium dense brown slightly silty fine to coarse SAND and GRAVEL including quartzite. Stained grey from 0.65m to 1.5m. (RIVER TERRACE DEPOSITS)	
	5	4.90/D/15 5.00/C/16 5.00-5.50/B/17	5.00 C	N=31 (3,4,5,6,9,11)						
	6	6.00/D/18 6.10/C/19 6.10-6.60/B/20	6.10 C	N=23 (3,3,4,5,7,7)			5.50		Medium dense brown slightly silty medium to coarse SAND and GRAVEL including quartzite. Soils stained black from 5.5m to 7.0m. (RIVER TERRACE DEPOSITS)	
	7	7.00-7.50/B/22 7.05/C/21	7.05 C	N=28 (3,4,5,7,7,9)						
	8	7.80/D/23 7.90/SPTLS/24 7.90-8.50/B/25	7.90 C	N=32 (3,5,6,7,9,10)			7.75 7.90		Medium dense red brown very clayey fine to coarse SAND.(MERCIA MUDSTONE GROUP)	
	9	8.50-8.70/B/26 8.70-9.00/D/27 9.00/SPTLS/28	9.00 C	50/45mm (15,10,50,0,0,0)			8.70 9.20		Very stiff red brown locally grey slightly silty CLAY.(MERCIA MUDSTONE GROUP)	
	10								Weak red brown locally green slightly weathered MUDSTONE.(MERCIA MUDSTONE GROUP)	
	11								<i>End of Borehole at 9.20 m</i>	
	12									
	13									
14										

Hole Started **25/10/2010** Hole Complete **25/10/2010**

Remarks: Water Observations, Chiselling, Installations etc
 Soils wet from 1.5m.

Test Type: S = Standard Penetration Test, C = Cone Penetration Test.
 N values reported are uncorrected. N value 50/275 = 50 blows in 275mm.



0320



Nicholls Colton & Partners Limited
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website: www.nicholls-colton.co.uk

TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5341 - MARMITE**

REPORT NO. E10/GRM/254/001		
ORDER REFERENCE: CRS/P5341	DATE OF ISSUE: 29/11/2010	
DATE & TIME OF SAMPLING: NOT PROVIDED	DATE OF RECEIPT: 15/11/2010	DATE OF TESTING: 15 TO 25/11/2010

NCA SAMPLE REFERENCE:	10-15930
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	13
STONE CONTENT: (%)	19

CLIENT SAMPLE REFERENCE:	BH1
SAMPLE LOCATION:	D2
SAMPLE DEPTH:	0.5m
VISUAL DESCRIPTION:	Brown gravelly clay

Acenaphthene	(mg/kg)	< 0.1
Acenaphthylene	(mg/kg)	< 0.1
Anthracene	(mg/kg)	< 0.1
Benzo (a) anthracene	(mg/kg)	< 0.1
Benzo (a) pyrene	(mg/kg)	< 0.1
Benzo (b) fluoranthene	(mg/kg)	< 0.1
Benzo (g, h, i) perylene	(mg/kg)	< 0.1
Benzo (k) fluoranthene	(mg/kg)	< 0.1
Chrysene	(mg/kg)	< 0.1
Dibenzo (a,h) anthracene	(mg/kg)	< 0.1
Fluoranthene	(mg/kg)	< 0.1
Fluorene	(mg/kg)	< 0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	< 0.1
Naphthalene	(mg/kg)	< 0.1
Phenanthrene	(mg/kg)	0.1
Pyrene	(mg/kg)	< 0.1

Arsenic	(mg/kg)	13.7
Cadmium	(mg/kg)	< 2.5
Chromium (Hexavalent)	(mg/kg)	< 1.1
Chromium (Total)	(mg/kg)	24.7
Copper	(mg/kg)	3.7
Lead	(mg/kg)	10.3
Mercury	(mg/kg)	< 0.7
Nickel	(mg/kg)	15.3
Selenium	(mg/kg)	< 5.0
Zinc	(mg/kg)	34.6

PHENOLS CONTENT	(mg/kg)	< 1.1
-----------------	---------	-------

PH VALUE		7.3
----------	--	-----


SOM	(%)	1.6
-----	-----	-----

TOTAL PAH CONTENT	(mg/kg)	1.6
-------------------	---------	-----

Cyanide (Total)	(mg/kg)	< 1.1
Sulphate (As SO ₄)	(mg/l)	171

NOTES:

- Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
- Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
- Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
- Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30 °C.
- Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
- Sample was supplied by customer.
- MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


.....
J. Gane
Environmental Laboratory Manager
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0320



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7-11 Harding Street, Leicester, LE1 4DH
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website: www.nicholls-colton.co.uk

TEST REPORT**GRM DEVELOPMENT SOLUTIONS SOIL SUITE****P5341 - - MARMITE**

REPORT NO. E10/GRM/254/002		
ORDER REFERENCE: CRS/P5341	DATE OF ISSUE: 29/11/2010	
DATE & TIME OF SAMPLING: NOT PROVIDED	DATE OF RECEIPT: 15/11/2010	DATE OF TESTING: 15 TO 25/11/2010

NCA SAMPLE REFERENCE:	10-15931
SAMPLE MATRIX:	Clay
MOISTURE CONTENT: (%)	14
STONE CONTENT: (%)	9.0

CLIENT SAMPLE REFERENCE:	BH1
SAMPLE LOCATION:	D3
SAMPLE DEPTH:	0.8m
VISUAL DESCRIPTION:	Brown gravelly sandy clay

Acenaphthene	(mg/kg)	< 0.1
Acenaphthylene	(mg/kg)	< 0.1
Anthracene	(mg/kg)	< 0.1
Benzo (a) anthracene	(mg/kg)	< 0.1
Benzo (a) pyrene	(mg/kg)	< 0.1
Benzo (b) fluoranthene	(mg/kg)	< 0.1
Benzo (g, h, i) perylene	(mg/kg)	< 0.1
Benzo (k) fluoranthene	(mg/kg)	< 0.1
Chrysene	(mg/kg)	< 0.1
Dibenzo (a,h) anthracene	(mg/kg)	< 0.1
Fluoranthene	(mg/kg)	< 0.1
Fluorene	(mg/kg)	< 0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	< 0.1
Naphthalene	(mg/kg)	< 0.1
Phenanthrene	(mg/kg)	< 0.1
Pyrene	(mg/kg)	< 0.1

Arsenic	(mg/kg)	24.3
Cadmium	(mg/kg)	< 2.5
Chromium (Hexavalent)	(mg/kg)	< 1.1
Chromium (Total)	(mg/kg)	15.9
Copper	(mg/kg)	7.6
Lead	(mg/kg)	11.4
Mercury	(mg/kg)	< 0.7
Nickel	(mg/kg)	11.1
Selenium	(mg/kg)	< 5.0
Zinc	(mg/kg)	25.5

PHENOLS CONTENT	(mg/kg)	< 1.1
-----------------	---------	-------

PH VALUE		7.3
----------	--	-----


SOM	(%)	1.3
-----	-----	-----

TOTAL PAH CONTENT	(mg/kg)	< 1.6
-------------------	---------	-------

Cyanide (Total)	(mg/kg)	< 1.1
Sulphate (As SO ₄)	(mg/l)	379

NOTES:

- Analysis was carried out in accordance with NCA method statements: MS - CL - PAH, MS - CL - Phenols (Skalar), MS - CL - Anions, MS - CL - ICP Metals, MS - CL - Chromium, MS - CL - Cyanide, MS - CL - TOC (SOM) and BS 1377: Parts 1 and 3 : 1990.
- Testing was carried out on an air dried sample for all tests with the exception of phenols, cyanide and hexavalent chromium that were determined on an as received sample.
- Concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve, where appropriate these results have been corrected for moisture content but not stone content.
- Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30 °C.
- Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on the 10mm test sieve.
- Sample was supplied by customer.
- MCERTS accreditation does not cover mercury, cyanide, chromium (hexavalent), anthracene, acenaphthylene, total PAH (USEPA list 16), SOM, sulphate and pH value. All testing is UKAS accredited with the exception of SOM, sulphate, cyanide and hexavalent chromium.


.....
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Staffordshire
DE14 2WH

ANALYTICAL REPORT No. 07.1.20

Report Issue date: 24/1/2007
Date Sampled: 19/1/2007
Date Submitted: 19/1/2007
Date Analysed: 19 – 24/1/2007

Customer: Unilever
Burton

Circulation: Customer File
M. Murphy
N. Boothroyd
B. Smith
B. Noon
A. Sellers

Borehole water

Appearance		yellow brown
Turbidity		moderate
Suspended solids	(mg/l)	31 (orange brown)
pH		7.38
Conductivity	($\mu\text{S cm}^{-1}$ @25°C)	2370
T.D.S.	(mg/l)	1580
(from conductivity)		
P alkalinity	(mg/l CaCO ₃)	0
M alkalinity	(mg/l CaCO ₃)	246
Total hardness	(mg/l CaCO ₃)	392
Calcium hardness	(mg/l CaCO ₃)	279
Magnesium hardness	(mg/l CaCO ₃)	113
Temporary hardness	(mg/l CaCO ₃)	246
Permanent hardness	(mg/l CaCO ₃)	146
Halide	(mg/l Cl ⁻)	467
Orthophosphate	(mg/l PO ₄ ³⁻)	<0.05
Sulphate	(mg/l SO ₄ ²⁻)	242
Reactive silica	(mg/l SiO ₂)	8.6
Dissolved iron	(mg/l Fe)	<0.05
Total iron	(mg/l Fe)	3.4
Dissolved manganese	(mg/l Mn)	0.05
Total manganese	(mg/l Mn)	0.06
TVC @ 30°C	(cfu/ml)	600
Spores	(cfu/ml)	<1
Coliforms	(cfu/ml)	<1
E. Coli	(cfu/ml)	<1
Yeast/moulds	(cfu/ml)	<1

ANALYTICAL REPORT No. 07.2.11

Report Issue date: 7/2/2007 (provisional)
Date Sampled: 6/2/2007
Date Submitted: 6/2/2007
Date Analysed: 6 – 12/2/2007

Customer: Unilever
 Burton

Circulation: Customer File
 M. Murphy
 N. Boothroyd
 B. Smith
 B. Noon
 A. Sellers

Borehole water

Appearance		Brown tint
Turbidity		Moderate
Suspended solids	(mg/l)	29 (Orange brown)
pH		7.43
Conductivity	($\mu\text{S cm}^{-1}$ @25°C)	2070
T.D.S.	(mg/l)	1380
(from conductivity)		
P alkalinity	(mg/l CaCO ₃)	0
M alkalinity	(mg/l CaCO ₃)	246
Total hardness	(mg/l CaCO ₃)	380
Calcium hardness	(mg/l CaCO ₃)	272
Magnesium hardness	(mg/l CaCO ₃)	108
Temporary hardness	(mg/l CaCO ₃)	246
Permanent hardness	(mg/l CaCO ₃)	134
Halide	(mg/l Cl ⁻)	378
Orthophosphate	(mg/l PO ₄ ³⁻)	<0.05
Sulphate	(mg/l SO ₄ ²⁻)	241
Reactive silica	(mg/l SiO ₂)	7.7
Dissolved iron	(mg/l Fe)	<0.05
Total iron	(mg/l Fe)	2.1
Dissolved manganese	(mg/l Mn)	0.04
Total manganese	(mg/l Mn)	0.04
TVC (48 hrs @ 30°C)	(cfu/ml)	110
Spores	(cfu/ml)	<1
Coliforms	(cfu/ml)	1
E. Coli	(cfu/ml)	<1
Yeast/moulds	(cfu/ml)	<1

Blend

Resistions
Jan. 2007

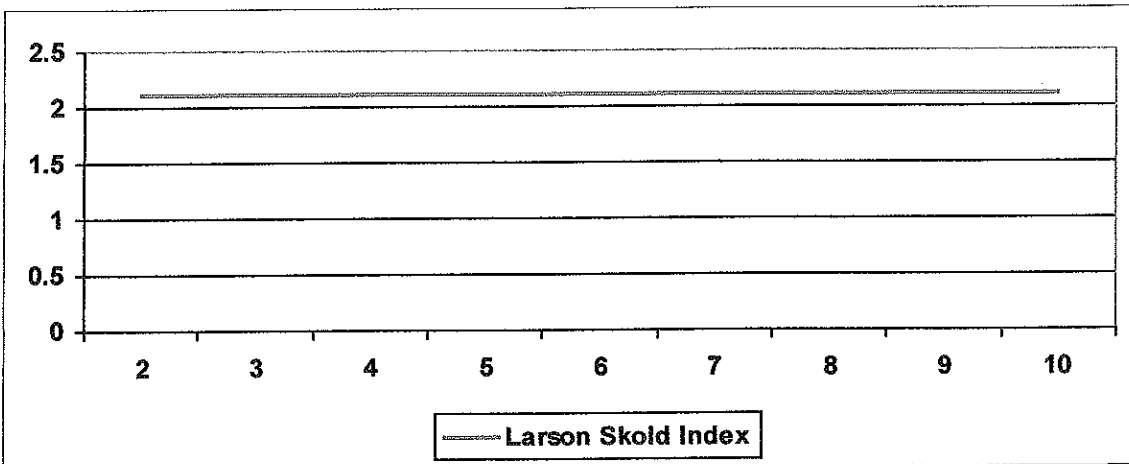
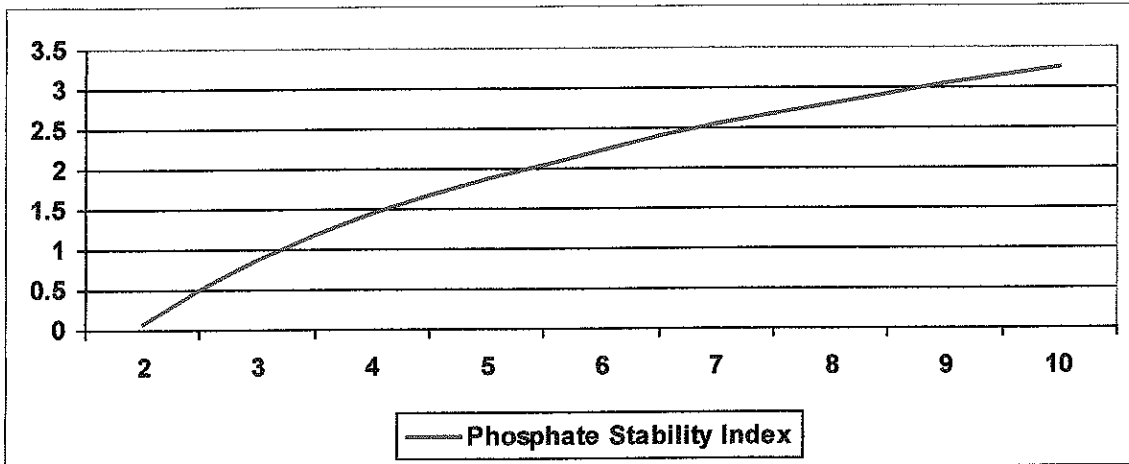
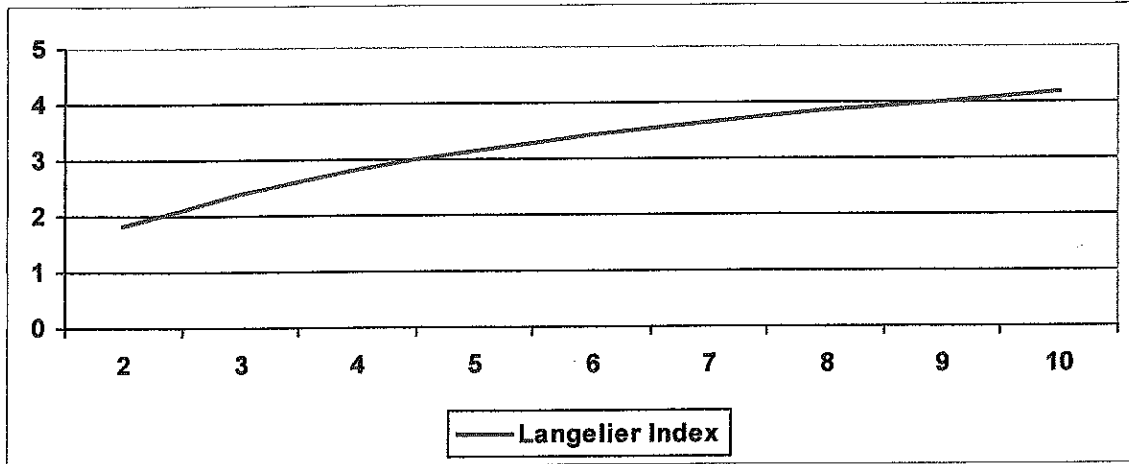
Predictor V2.79																		
Source	First	Second	Third	Fourth	Fifth	Blend												
Ratio of source water	0.5	0.5	0	0	0	Blend												
pH	7.38	7.3	0	0	0	7.89	-	-										
Phenol Alkalinity	0	0	0	0	0	0	mg/l	CaCO ₃										
Methyl alkalinity	246	140	0	0	0	193	mg/l	CaCO ₃										
Total Hardness	392	270	0	0	0	331	mg/l	CaCO ₃										
Calcium Hardness	279	170	0	0	0	224.5	mg/l	CaCO ₃										
Magnesium Hardness	113	70	0	0	0	91.5	mg/l	CaCO ₃										
Zinc	0	0	0	0	0	0	mg/l	Zn										
Chloride	467	35	0	0	0	251	mg/l	Cl										
Sulphate	242	105	0	0	0	173.5	mg/l	SO ₄ ²⁻										
Iron	3.4	0	0	0	0	1.7	mg/l	Fe										
Silica	8.6	0	0	0	0	4.3	mg/l	SiO ₂										
Phosphate	0	5	0	0	0	2.5	mg/l	PO ₄ ³⁻										
TDS	1580	367	0	0	0	974	mg/l	-										
Conductivity	2370	550	0	0	0	1460	mS/m	-										
Temperature in °C	30					30	°C	-										
Temperature in °F	86					86	°F	-										

Customer	Unilever	Site	Cycles		Burton	Increment	0.5						
			1.5	4.0			0	mg/l CaCO3 in system water	5.0	5.5	6.0		
Predictor v2.79	Bokeh Water/Mains Ble		Starting Value	Alkalinity Control with Hydrochloric Acid	0		Alkalinity Control with Sulphuric Acid	0					
Analysis	Make up (analysed)	Make up (as blended)	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	
pH	7.89	8.04	8.23	8.37	8.48	8.58	8.67	8.74	8.81	8.87	8.92		
Methyl alkalinity mg/l CaCO3	193	246	328	410	492	574	656	738	820	902	984		
Total Hardness mg/l CaCO3	331	497	662	828	993	1159	1324	1490	1655	1821	1986		
Calcium Hardness mg/l CaCO3	225	337	449	561	674	786	898	1010	1123	1235	1347		
Magnesium Hardness mg/l CaCO3	92	137	183	229	275	320	366	412	458	503	549		
Zinc mg/l Zn													
Chloride mg/l Cl	251	376.5	502.0	627.5	753.0	878.5	1004.0	1129.5	1255.0	1380.5	1506.0		
Sulphate mg/l SO4	174	260.3	347.0	433.8	520.5	607.3	694.0	780.8	867.5	954.3	1041.0		
Iron mg/l Fe	1.7	2.6	3.4	4.3	5.1	6.0	6.8	7.7	8.5	9.4	10.2		
Silica mg/l SiO2	4.3	6.5	8.6	10.8	12.9	15.1	17.2	19.4	21.5	23.7	25.8		
Phosphate mg/l PO4	3	3.8	5.0	6.3	7.5	8.8	10.0	11.3	12.5	13.8	15.0		
Conductivity mS/cm	1460	2190	2920	3650	4380	5110	5840	6570	7300	8030	8760		
TDS mg/l	974	1460	1947	2434	2921	3407	3894	4381	4868	5354	5841		
Ryznar index at 30°C	7.21	6.65	6.10	5.71	5.43	5.17	4.91	4.65	4.39	4.13	3.87		
Scale - Corrosion Potential	Corrosive	OK	OK	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling		
Langelier index at 30°C	0.34	0.70	1.06	1.33	1.52	1.71	1.90	2.09	2.28	2.47	2.66		
Scale - Corrosion Potential	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling		
Practical scale index at 30°C	6.35	5.67	5.01	4.50	4.08	3.73	3.43	3.16	2.92	2.70	2.50		
Scale - Corrosion Potential	OK	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling		
Phosphate scale index at 30°C	-1.42	-0.73	-0.16	0.28	0.64	0.95	1.21	1.44	1.65	1.84	2.01		
Calcium Phosphate Potential at 30°C	OK	OK	OK	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling	Scaling		
Larson Skold index	2.77	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26		
Local corrosion Potential	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Possible	Possible		
Calcium Sulphate at 30°C	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK		
Iron-polymer limit	OK	High	High	High	High	High	High	High	High	High	High		

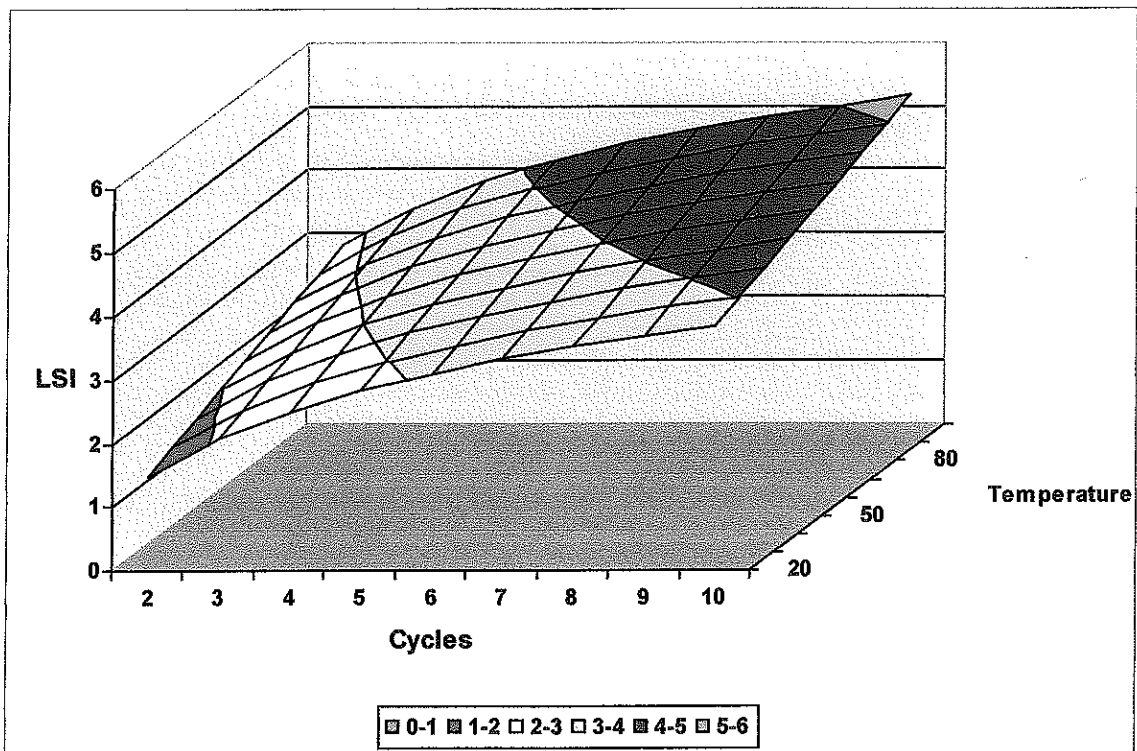
Predictor v2.79

Current Cycles =		5		Comments
Analysis	System (analysed)	Typical value at current cycles		
pH	4.0	9.2		Potential Acid Ingress - Investigate Low pH - Outside Industry Guidelines
Methyl alkalinity mg/l CaCO3	1.0	772.0		Potential Fouling and Loss of Water Treatment activity - Investigate
Total Hardness mg/l CaCO3	0.0			
Calcium Hardness mg/l CaCO3	0.0	954.1		Potential Fouling and Loss of Water Treatment activity - Investigate
Magnesium Hardness mg/l CaCO3	0.0	457.5		
Zinc mg/l Zn	1.0	Precipitation expected		Potential Fouling and Loss of Water Treatment activity - Investigate
Chloride mg/l Cl	0.0	0.0		Within Industry Guidelines
Sulphate mg/l SO4	0.0	0.0		Within Industry Guidelines
Silica mg/l SiO2	0.0	0.0		Within Industry Guidelines
Phosphate mg/l PO4	0.0	11.3		Potential Fouling and Loss of Water Treatment activity - Investigate
Iron mg/l Fe	0.5			Within Industry Guidelines
Conductivity mS/cm	0.0			Within Industry Guidelines
TDS mg/l	0.0			Within Industry Guidelines

Predicted Water Quality



Langelier profile prediction



24" Oct. 2006

	M-alk (ppm CaCO3)
Towns mains	140
2:1 Blend	240
This Implies...	
Theoretical Bore hole	440

Ratio	make up	Cycles			
		1.8	2	3	4
		Malk			
100 TMW	140	252	280	420	560
80TMW 20 BH	200	360	400	600	800
60TMW 40 BH	260	468	520	780	1040
50TMW 50 BH	290	522	580	870	1160
40TMW 60 BH	320	576	640	960	1280
20TMW 80 BH	380	684	760	1140	1520
100 BH	440	792	880	1320	1760

amount of alk "lost" to ClO2
is about 180 - 240ppm

Taking 210ppm as average loss.....

Ratio	make up	estimated Malk after losses			3	4
		1.8	2	losses		
100 TMW	10	42	70	210	350	
80TMW 20 BH	10	150	190	390	590	
60TMW 40 BH	50	258	310	570	830	
50TMW 50 BH	80	312	370	660	950	
40TMW 60 BH	110	366	430	750	1070	
20TMW 80 BH	170	474	550	1140	1520	
100 BH	230	582	670	1110	1550	

ESTIMATED pH VALUES

Ratio	make up	Malk			
		1.8	2	3	4
100 TMW	5.9	6.8	7.1	7.8	8.2
80TMW 20 BH	5.9	7.6	7.8	8.2	8.5
60TMW 40 BH	6.9	8.0	8.1	8.5	8.7
50TMW 50 BH	7.2	8.1	8.2	8.6	8.8
40TMW 60 BH	7.4	8.2	8.3	8.7	8.9
20TMW 80 BH	7.7	8.4	8.5	8.9	9.1
100 BH	7.9	8.5	8.6	8.9	9.1

This would suggest 40% Borehole is minimum requirement.

**A
P
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E
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D
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X

C**



Site Details:

Unilever, Wellington
Road, Burton-upon-Trent

Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: County Series

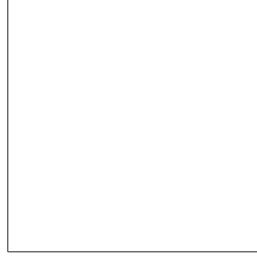
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Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1884
Revised 1884
Edition NA
Copyright NA
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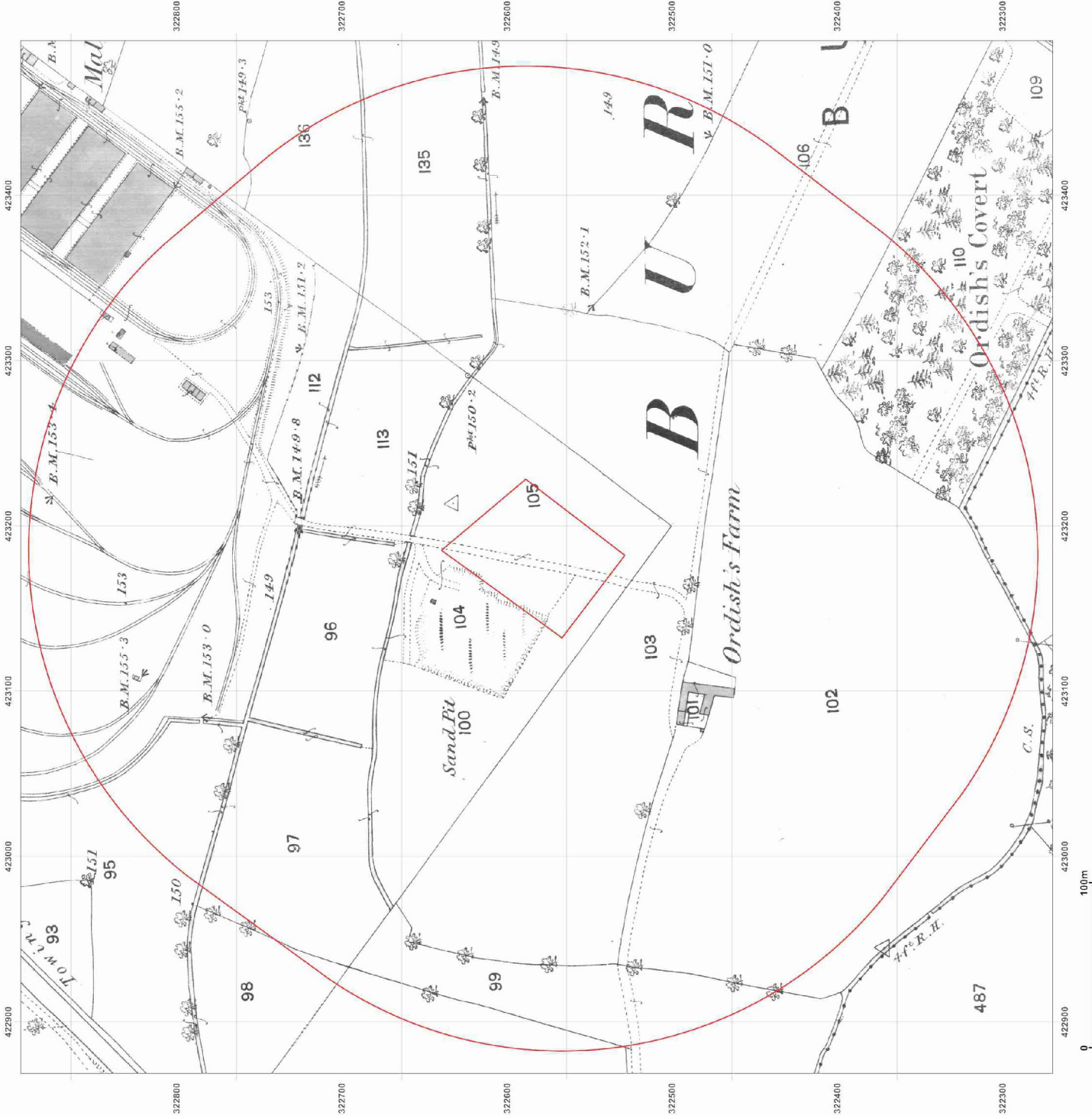


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Site Details:

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Road, Burton-upon-Trent

Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: County Series

Map date: 1901

Scale: 1:2,500

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Surveyed 1901
Revised 1901
Edition NA
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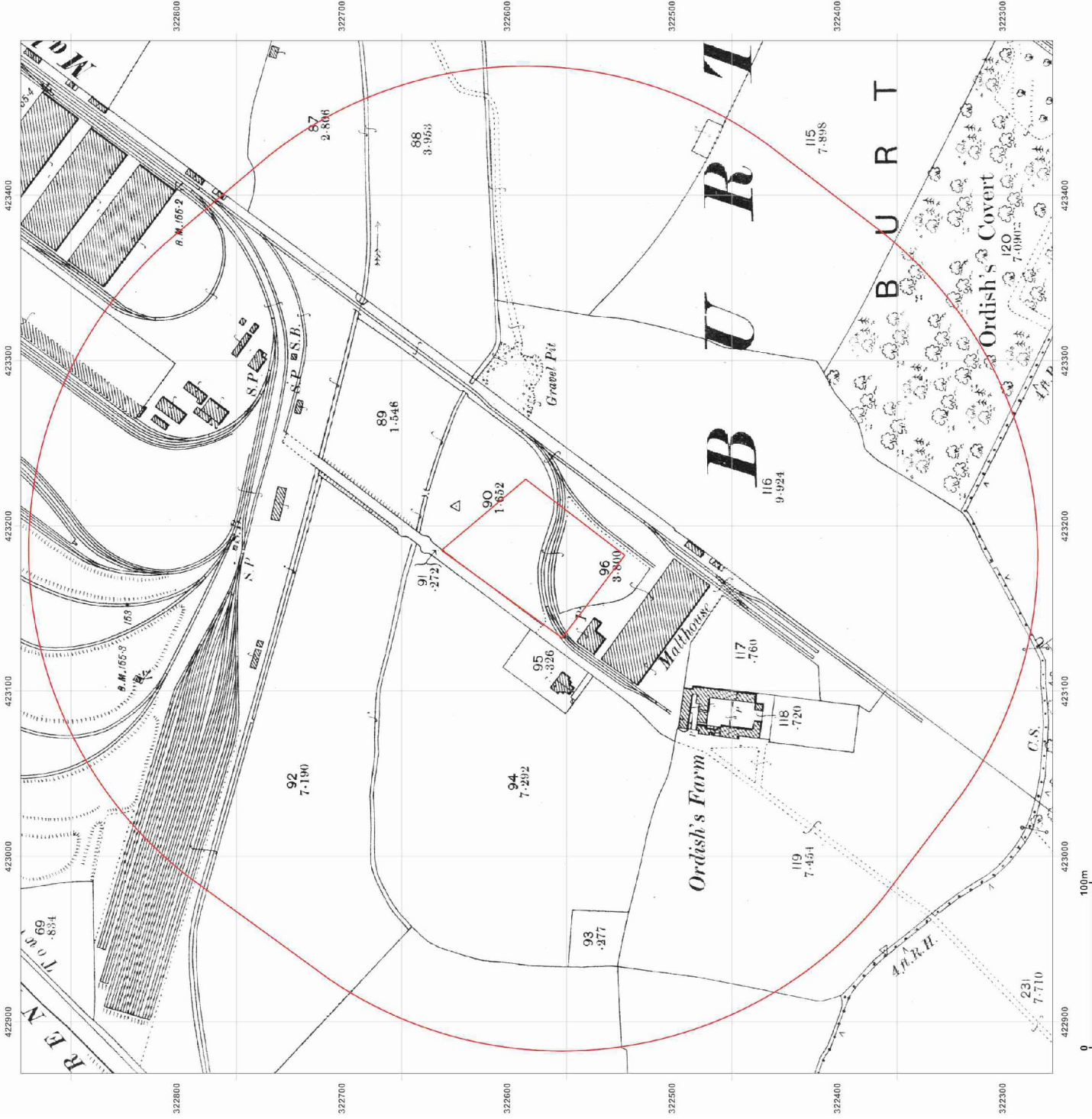


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Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: County Series

Map date: 1923

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1923
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Edition NA
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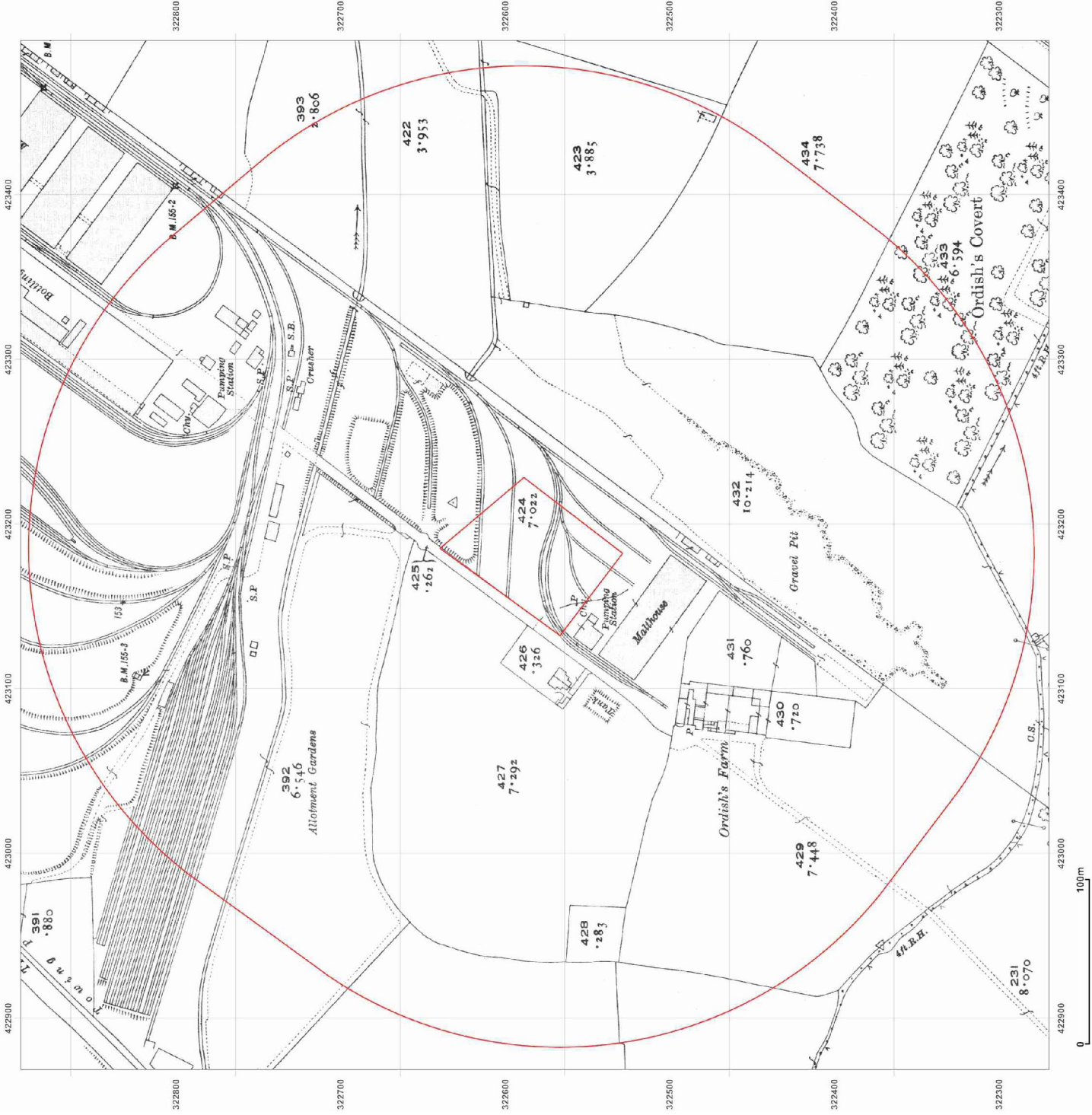
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Site Details:

Unilever, Wellington
Road, Burton-upon-Trent

Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: County Series

Map date: 1937

Scale: 1:2.500

Printed at: 1:2.500



Surveyed 1937
Revised 1937
Edition NA
Copyright NA
Levelled NA



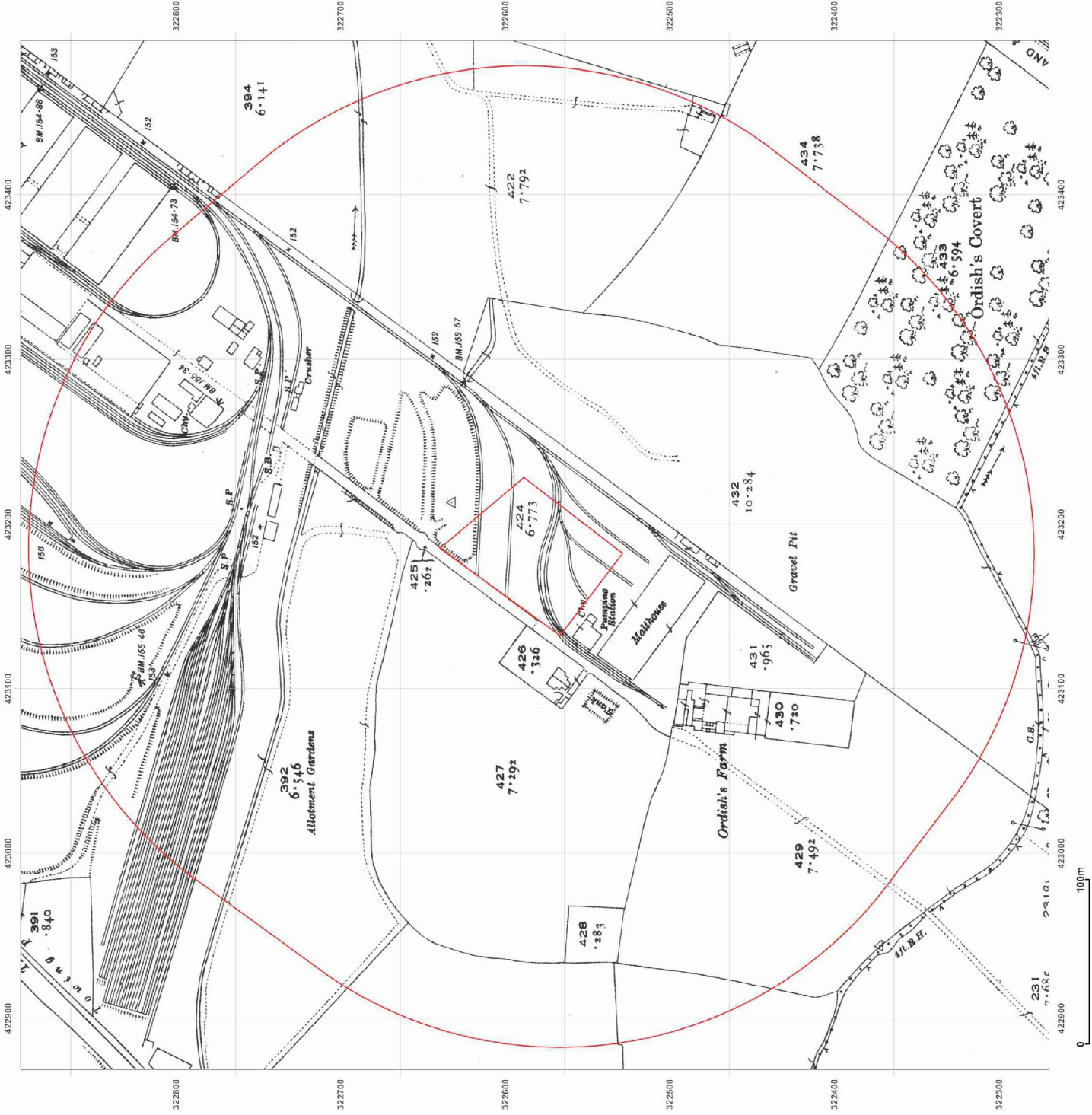
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Site Details:

Unilever, Wellington
Road, Burton-upon-Trent

Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: National Grid

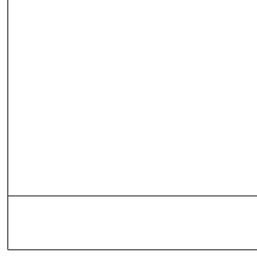
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Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1950
Revised 1950
Edition N/A
Copyright N/A
Levelled 1948



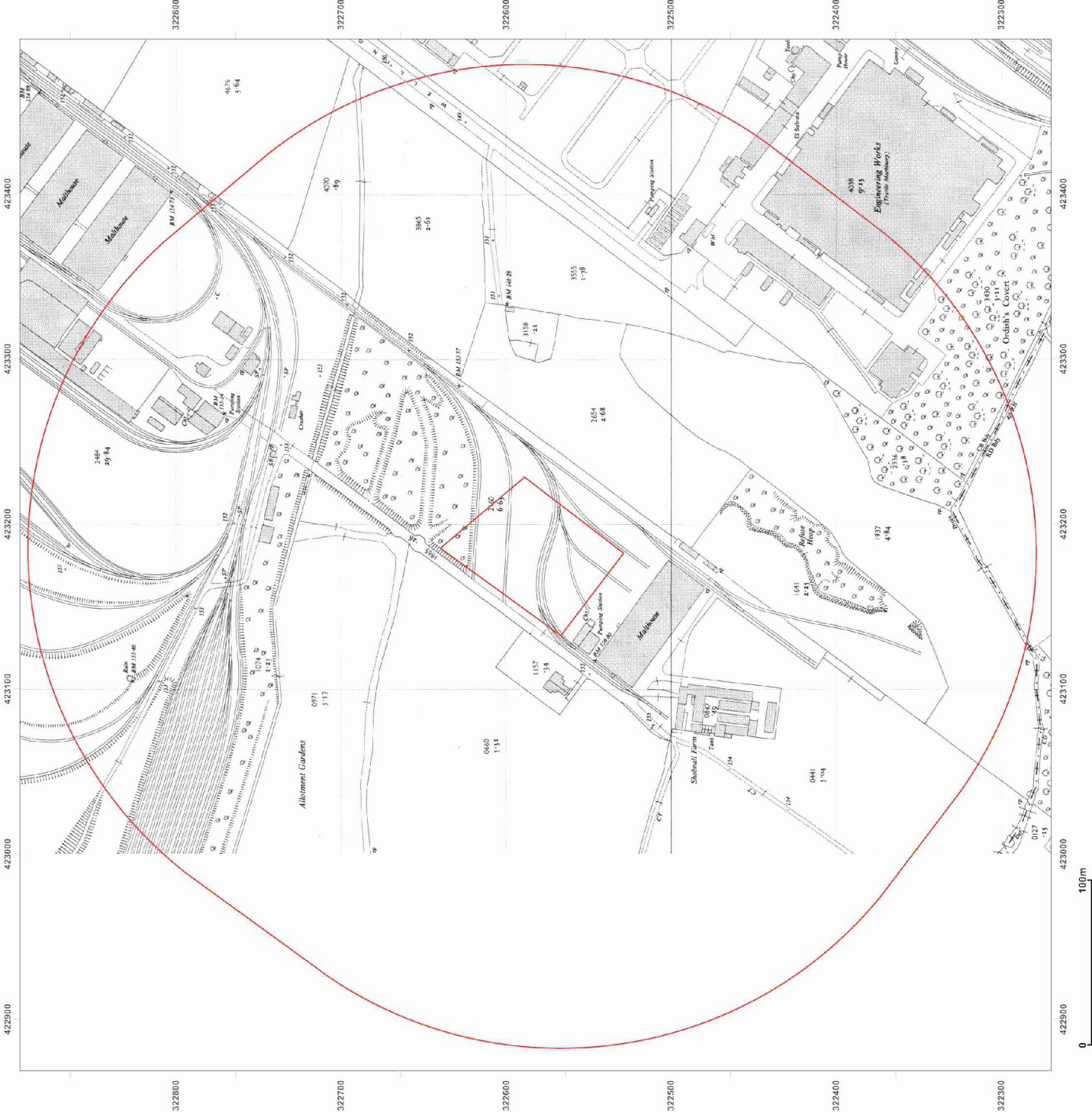
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Site Details:

Unilever, Wellington
Road, Burton-upon-Trent

Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: National Grid

Map date: 1964

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1950
Revised 1970
Edition N/A
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Levelled 1967



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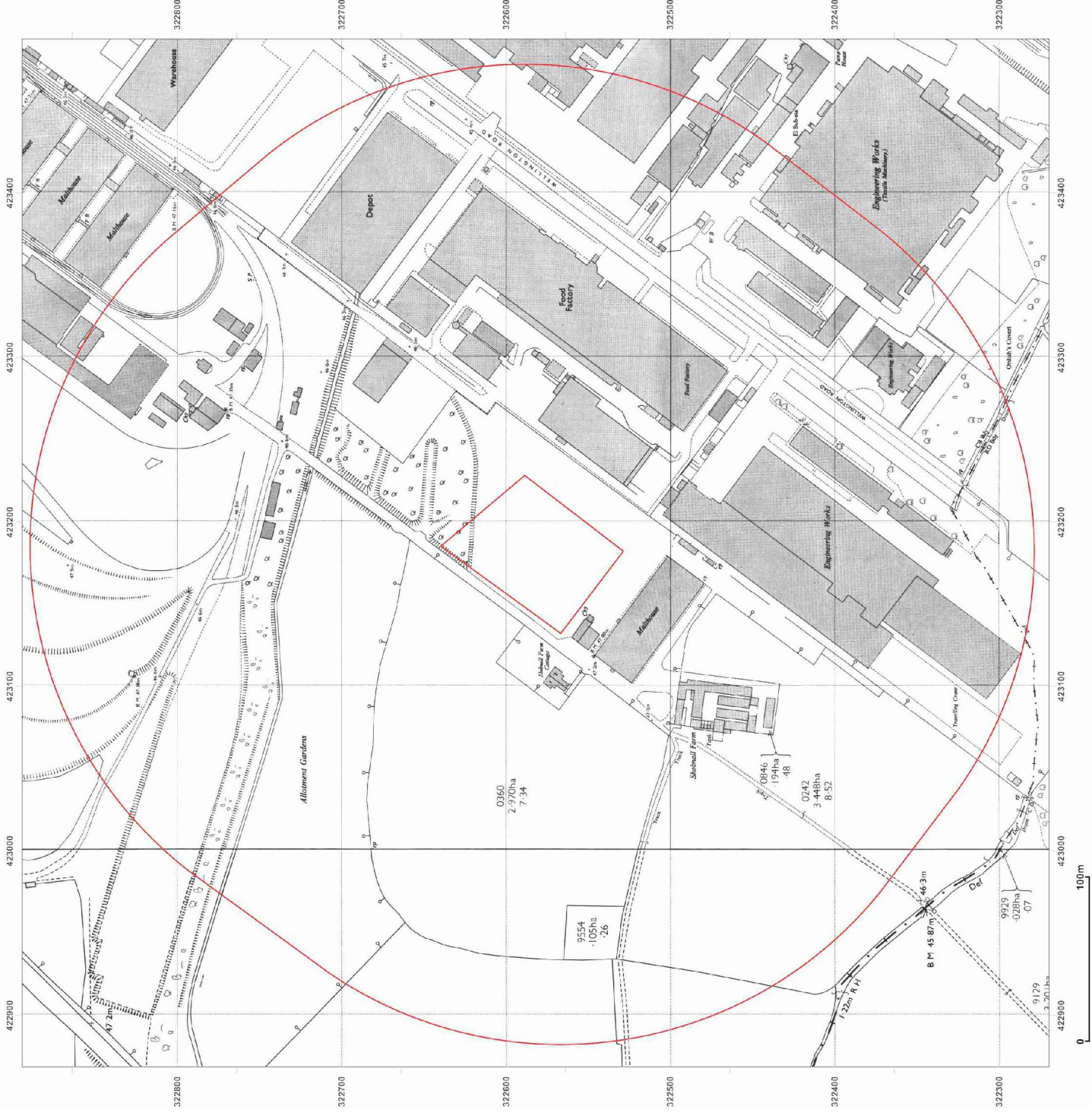


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Site Details:

Unilever, Wellington
Road, Burton-upon-Trent

Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: National Grid

Map date: 1988-1992

Scale: 1:1,250

Printed at: 1:2,500



Surveyed-1967 Revised 1988 Edition N/A Copyright 1988 Levelled 1967	Surveyed 1967 Revised 1992 Edition N/A Copyright 1992 Levelled 1967
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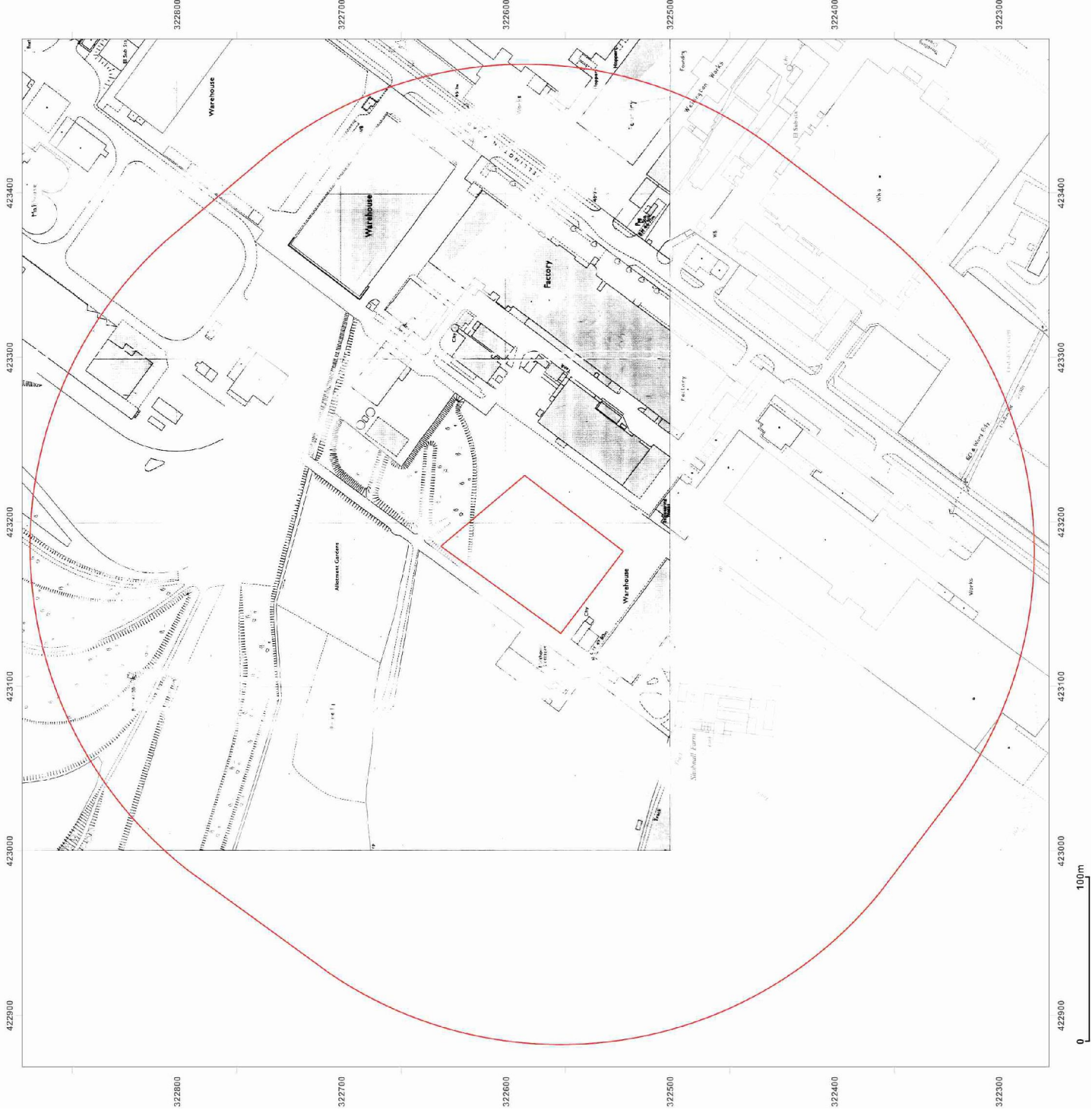


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Site Details:

Unilever, Wellington
Road, Burton-upon-Trent

Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: National Grid

Map date: 1992-1994

Scale: 1:1,250

Printed at: 1:2,500



Surveyed-1967 Revised 1992 Edition N/A Copyright 1992 Levelled 1967	Surveyed N/A Revised N/A Edition N/A Copyright 1994 Levelled N/A
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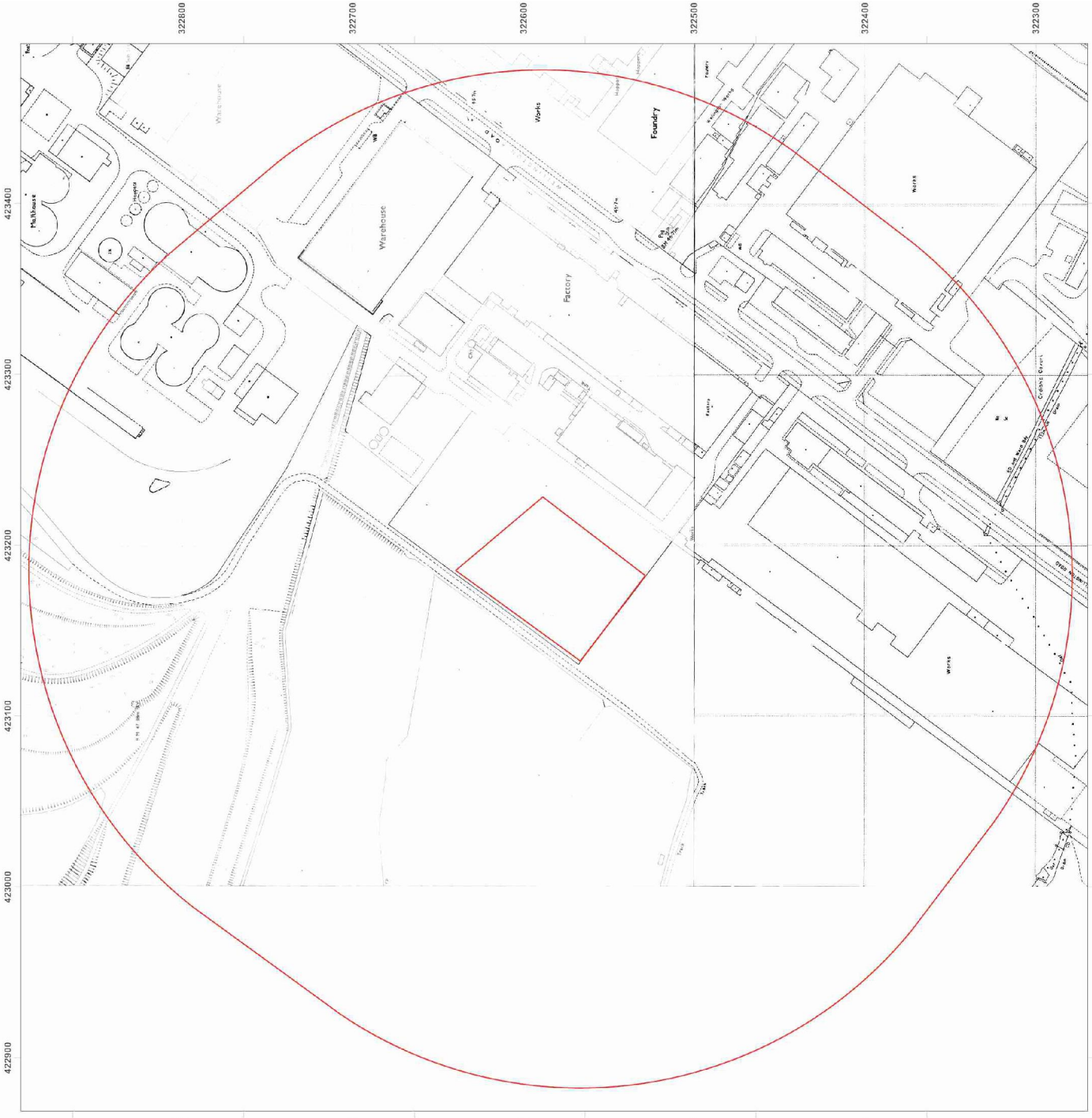


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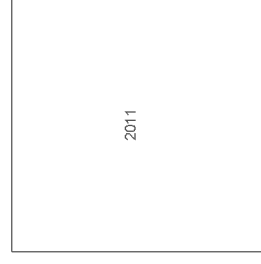
Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: MasterMap

Map date: 2011

Scale: 1:2,500

Printed at: 1:2,500



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Site Details:

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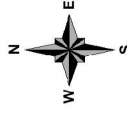
Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: County Series

Map date: 1882

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1882
Revised 1882
Edition NA
Copyright NA
Levelled NA



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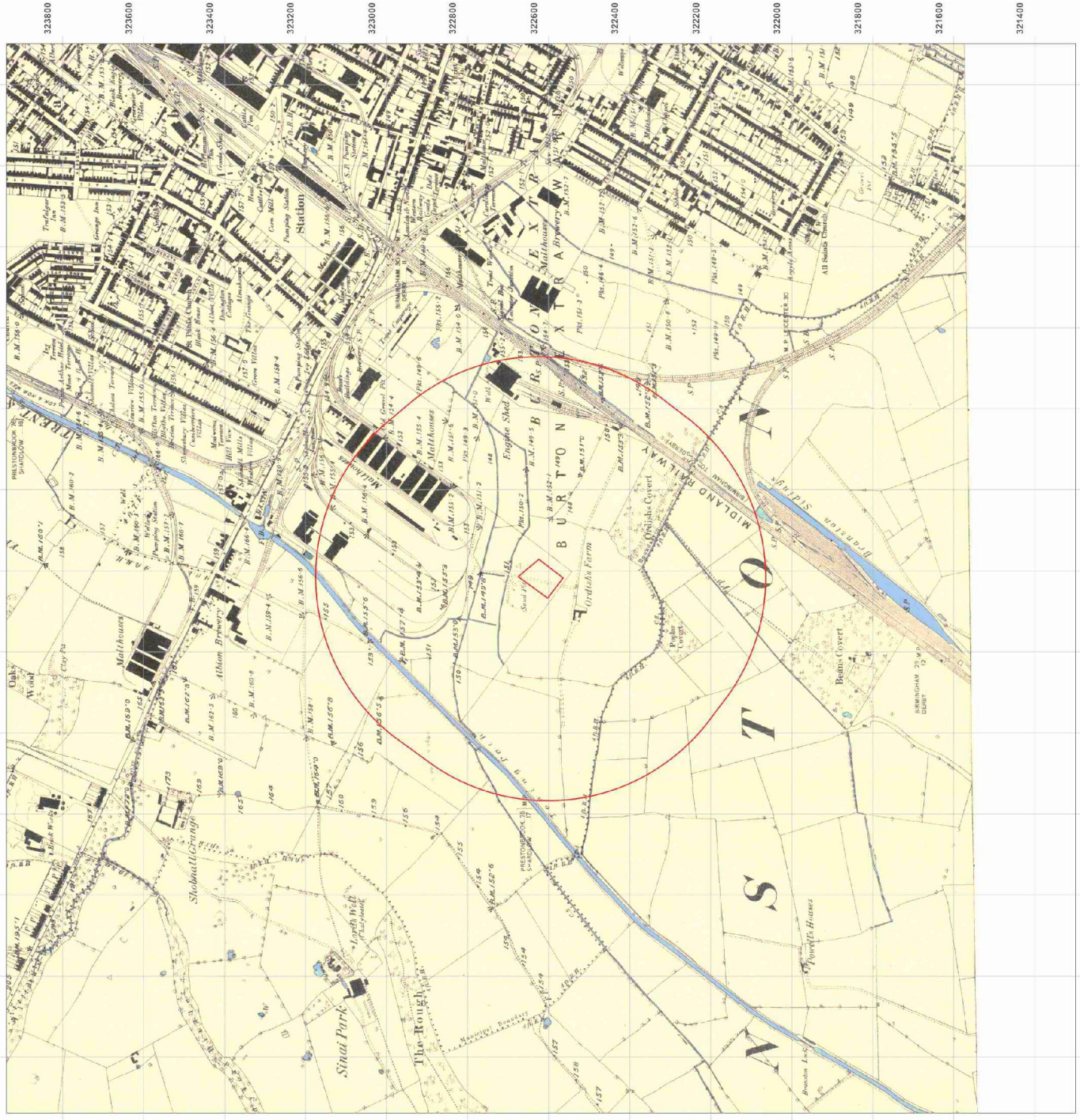


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Site Details:

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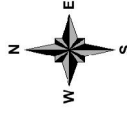
Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: County Series

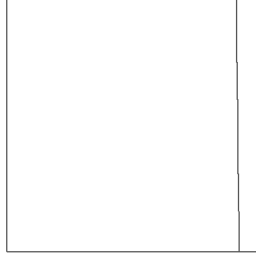
Map date: 1924

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1879
Revised 1924
Edition NA
Copyright NA
Levelled NA



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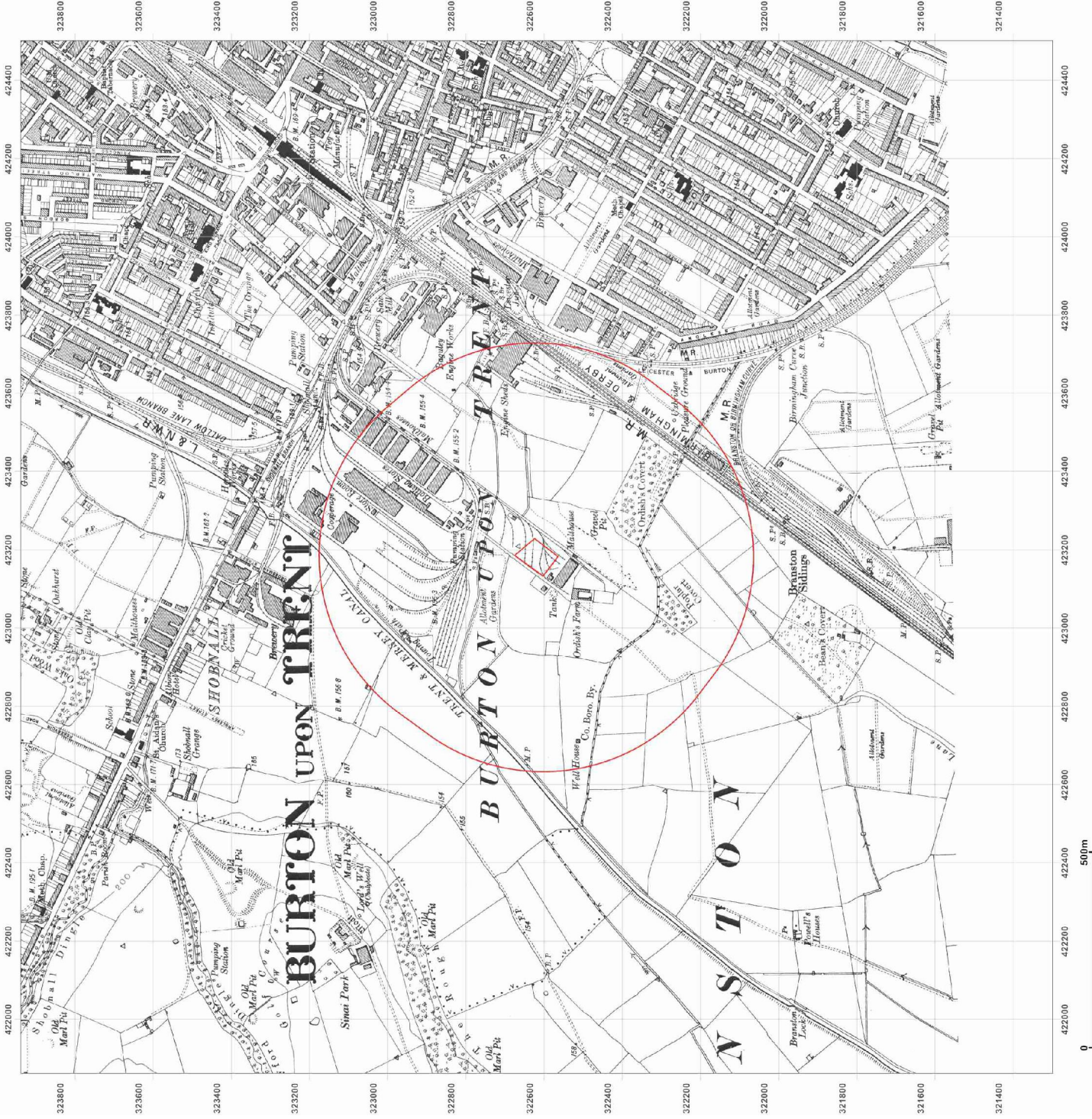


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Site Details:

Unilever, Wellington
Road, Burton-upon-Trent

Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: Provisional

Map date: 1949

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1949
Revised 1949
Edition NA
Copyright NA
Levelled NA



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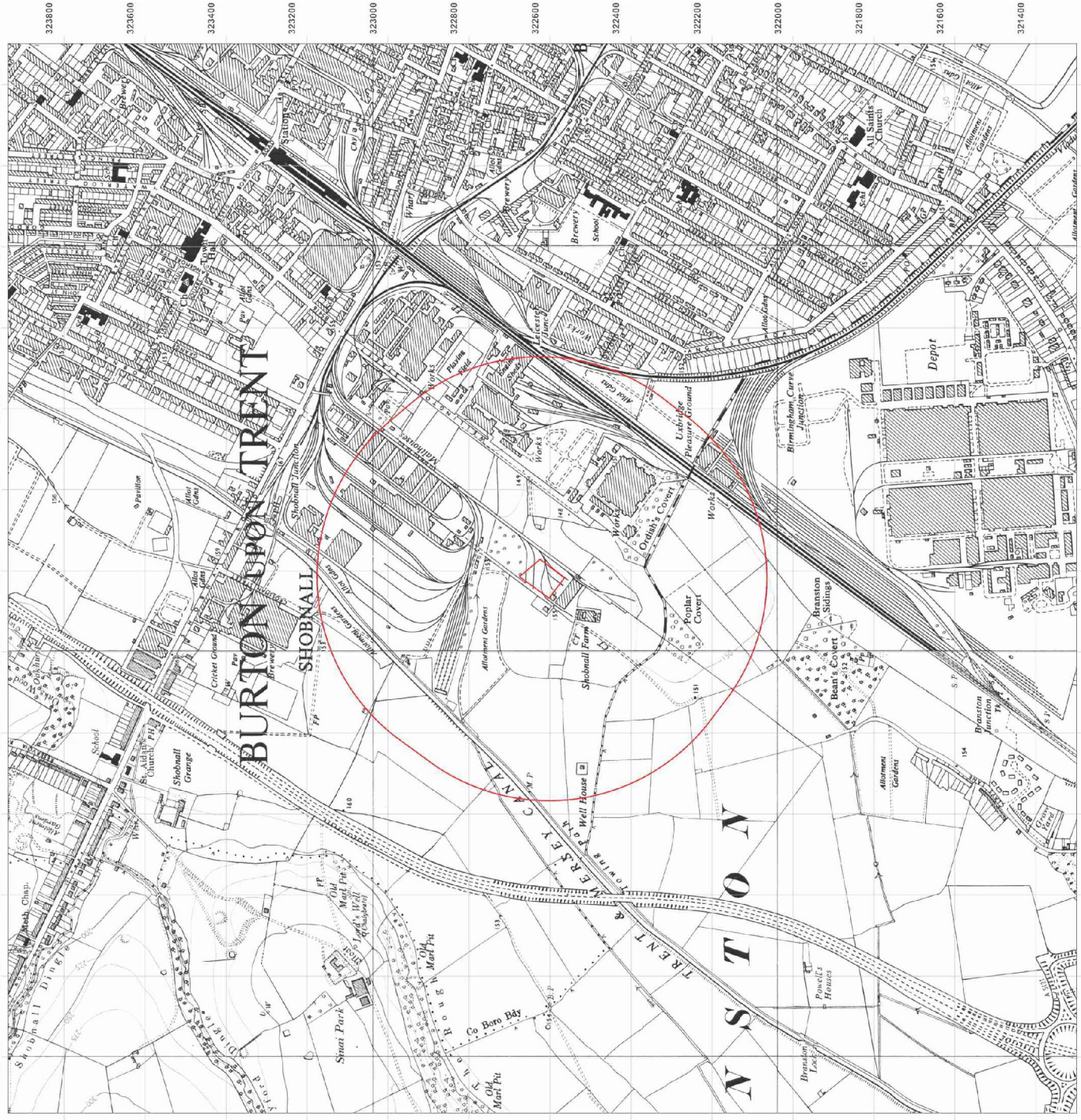


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Site Details:

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Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: National Grid

Map date: 1973

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
Revised 1973
Edition NA
Copyright NA
Levelled NA



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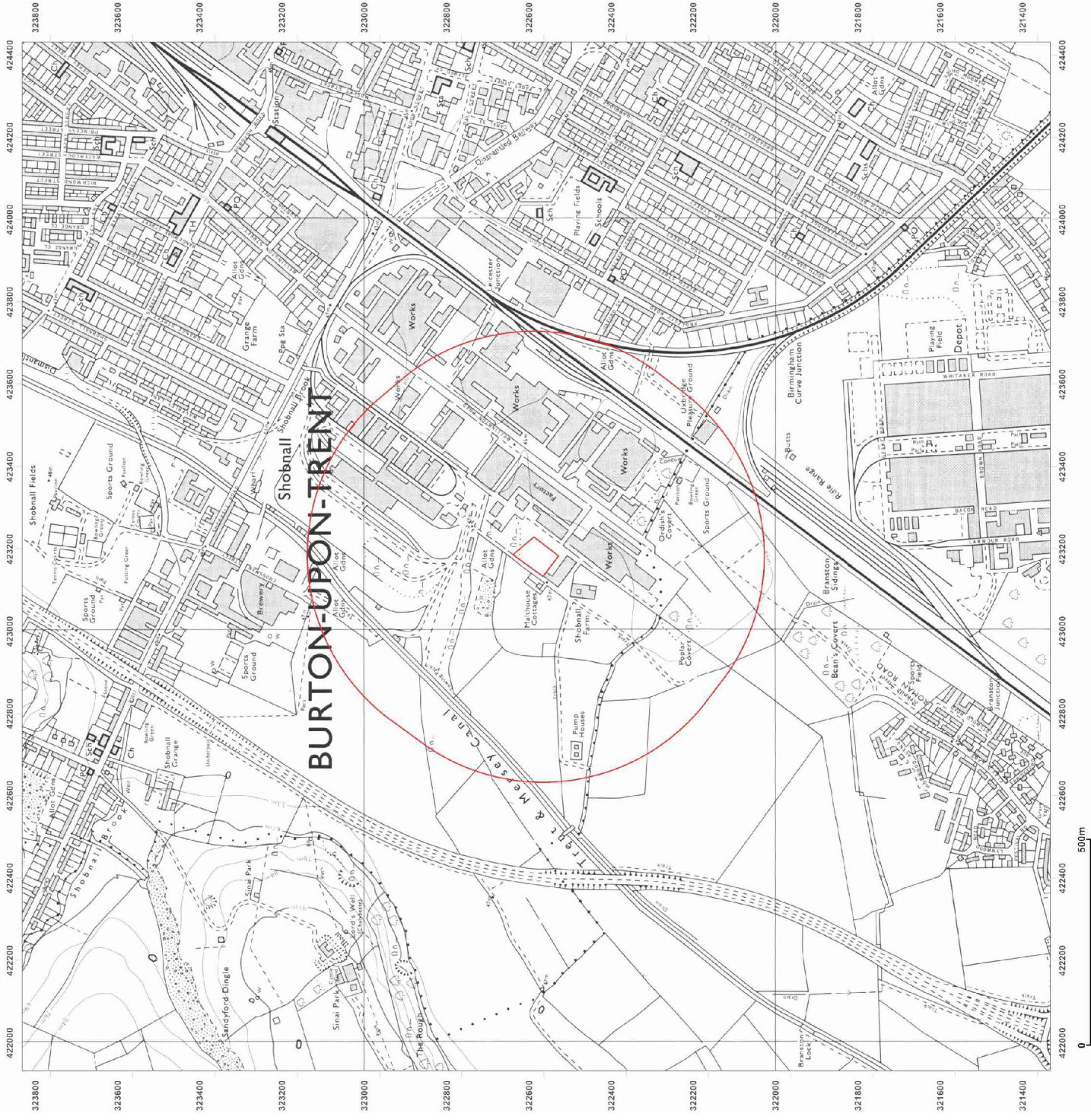


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Site Details:

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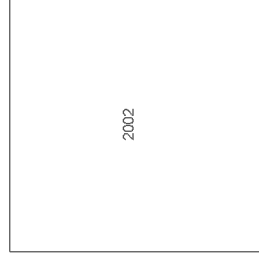
Client Ref: EMS_128225_175965
Report Ref: EMS-128225_175965
Grid Ref: 423181, 322582

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



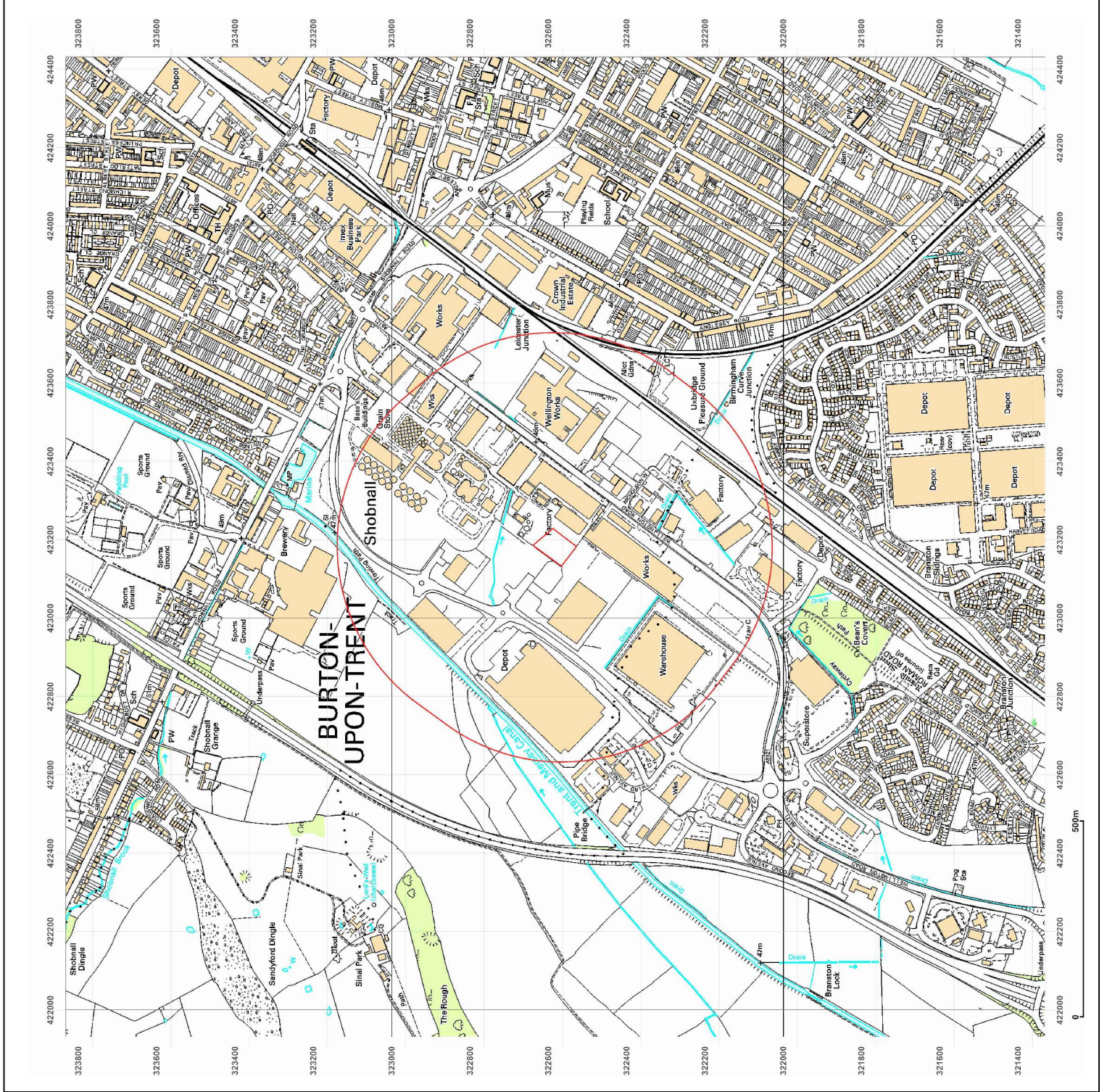
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EmapSite
Masdar House, ,
Eversley, RG27 0RP

GroundSure Reference: EMS-128225_175967
Your Reference: EMS_128225_175967
Report Date: May 23, 2011
Report Delivery Method: **Email - pdf**
Client Email: sales@emapsite.com

GroundSure EnviroInsight

Address: Unilever, Wellington Road, Burton-upon-Trent

Dear Sir/Madam,

Thank you for placing your order with emapsite. Please find enclosed the GroundSure EnviroInsight as requested

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

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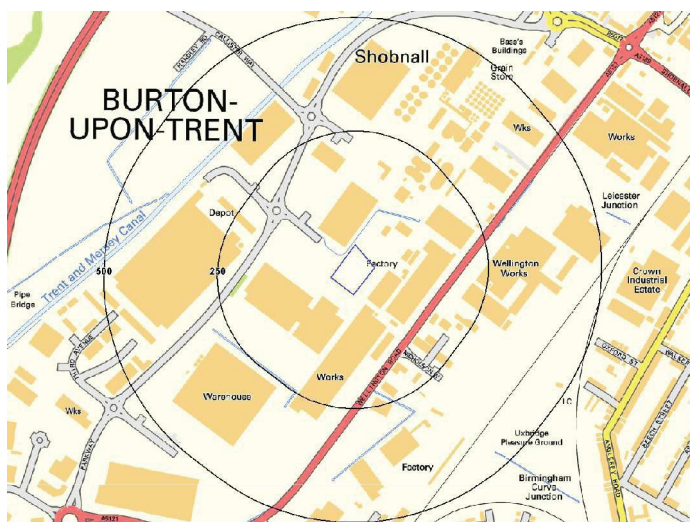
Address: Unilever, Wellington Road, Burton-upon-Trent

Date: May 23, 2011

GroundSure Reference: EMS-128225_175967

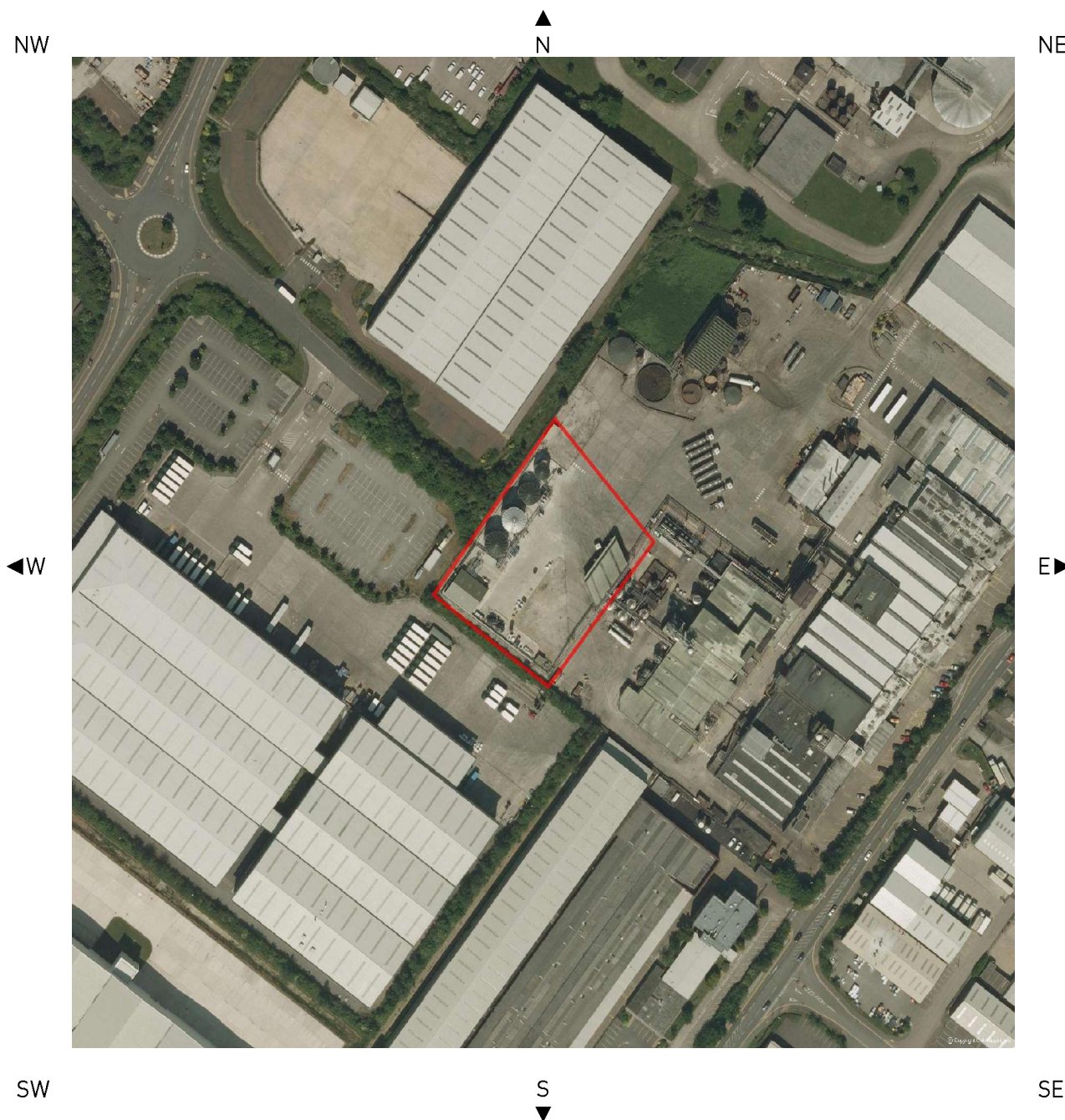
Your Reference: EMS_128225_175967

Client: EmapSite



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Aerial Photograph of Study Site



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Site Name: Unilever, Wellington Road, Burton-upon-Trent
Grid Reference: 423181,322582
Size of Site: 0.53 ha

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) m of the study site boundary					
	on-site	0-50	51-250	251-500	501-1000	1000-1500
1. Environmental Permits, Incidents and Registers						
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations						
Records of historic IPC Authorisations	0	0	5	0	-	-
Records of Part A(1) and IPPC Authorised Activities	0	0	6	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	1	0	-	-
Records of List 2 Dangerous Substances Inventory sites	0	0	1	1	-	-
Records of Part A(2) and Part B Activities and Enforcements	0	0	3	1	-	-
Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	4	0	-	-
Records of Licensed Discharge Consents	0	0	1	1	-	-
Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0		
1.2 Records of COMAH and NIHHS sites	0	0	0	0	-	-
1.3 Environment Agency Recorded Pollution Incidents						
National Incidents Recording System, List 2	0	0	4	-	-	-
National Incidents Recording System, List 1	0	0	0	-	-	-
1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990	0	0	0	0	-	-
2. Landfill and Other Waste Sites						
2.1 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	0	0	5
Landfill Data – Non-Operational Landfill Sites	0	0	0	0	1	-
BGS/DoE Landfill Site Survey	0	0	0	0	0	3
GroundSure Local Authority Landfill Sites Data	0	0	5	0	0	5
2.2 Landfill and Other Waste Sites Findings						
Operational Waste Treatment, Transfer and Disposal Sites	0	0	1	0	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	-	-
Environment Agency Licensed Waste Sites	0	0	0	2	9	7

3. Current Land Uses	on-site	0-50	51-250	251-500	501-1000	1000-1500
3.1 Current Industrial Sites Data	0	2	17	-	-	-
3.2 Records of Petrol and Fuel Sites	0	0	1	0	-	-
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0	-	-

4. Geology Description

- 4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site? * No
- 4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site? * Yes
- 4.3 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

Source: Scale: 1:50,000 BGS Sheet 140

* This includes an automatically generated 50m buffer zone around the site.

5. Hydrogeology and Hydrology on-site 0-50 51-250 251-500 501-1000 1001-2000

- 5.1 Are there any records of Productive Strata in the Superficial Geology within 500m of the study site? Yes
- 5.2 Are there any records of Productive Strata in the Bedrock Geology within 500m of the study site? Yes
- 5.3 Groundwater Abstraction Licences (within 1000m of the study site). 0 0 6 7 46 -
- 5.4 Surface Water Abstraction Licences (within 1000m of the study site). 0 0 0 0 0 -
- 5.5 Potable Water Abstraction Licences (within 2000m of the study site). 0 0 0 0 0 0
- 5.6 Are there any Source Protection Zones within 500m of the study site? Yes
- 5.7 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 |
- 5.8 Detailed River Network entries within 500m of the site 0 1 4 11 - -
- 5.9 Surface water features within 250m of the study site No Yes Yes - - -

6. Flooding

- 6.1 Are there any Environment Agency indicative Zone 2 floodplains within 250m of the study site? Yes
- 6.2 Are there any Environment Agency indicative Zone 3 floodplains within 250m of the study site? Yes
- 6.3 Are there any Flood Defences within 250m of the study site? No
- 6.4 Are there any areas benefiting from Flood Defences within 250m of the study site? Yes
- 6.5 Are there any areas used for Flood Storage within 250m of the study site? No
- 6.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site? Very High
- 6.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas? Moderate

7. Designated Environmentally Sensitive Sites on-site 0-50 51-250 251-500 501-1000 1001-1500

- 7.1 Records of Sites of Special Scientific Interest (SSSI) 0 0 0 0 - -
- 7.2 Records of National Nature Reserves (NNR) 0 0 0 0 - -

7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	-	-
7.3 Records of Local Nature Reserves (LNR)	0	0	0	0	-	-
7.4 Records of Special Areas of Conservation (SAC)	0	0	0	0	-	-
7.5 Records of Special Protection Areas (SPA)	0	0	0	0	-	-
7.6 Records of Ramsar sites	0	0	0	0	-	-
7.7 Records of World Heritage Sites	0	0	0	0	-	-
7.8 Records of Environmentally Sensitive Areas	0	0	0	0	-	-
7.9 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	-	-
7.10 Records of National Parks	0	0	0	0	-	-
7.11 Records of Nitrate Sensitive Areas	0	0	0	0	-	-
7.12 Records of Nitrate Vulnerable Zones	1	0	0	0	-	-

8. Natural Hazards

8.1 What is the maximum risk of natural ground subsidence? Very Low

9. Mining

- 9.1 Are there any coal mining areas within 75m of the study site? No
- 9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site? Negligible
- 9.3 Are there any brine affected areas within 75m of the study site? No



EmapSite
Masdar House,
Eversley, RG27 0RP

Report Reference: EMS-
128225_175966
Your Reference: EMS_128225_175
966
Report Date May 23, 2011
Report Delivery Email - pdf
Method:

GroundSure GeoInsight

Address: Unilever, Wellington Road, Burton-upon-Trent

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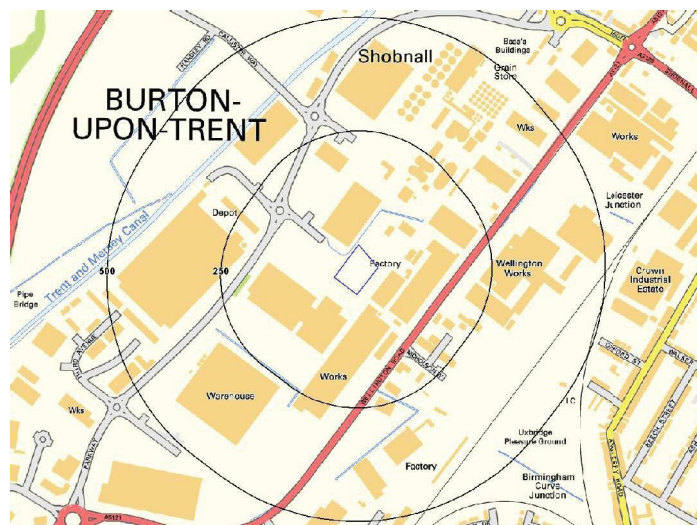
GroundSure GeoInsight

Address: Unilever, Wellington Road, Burton-upon-Trent

Date: May 23, 2011

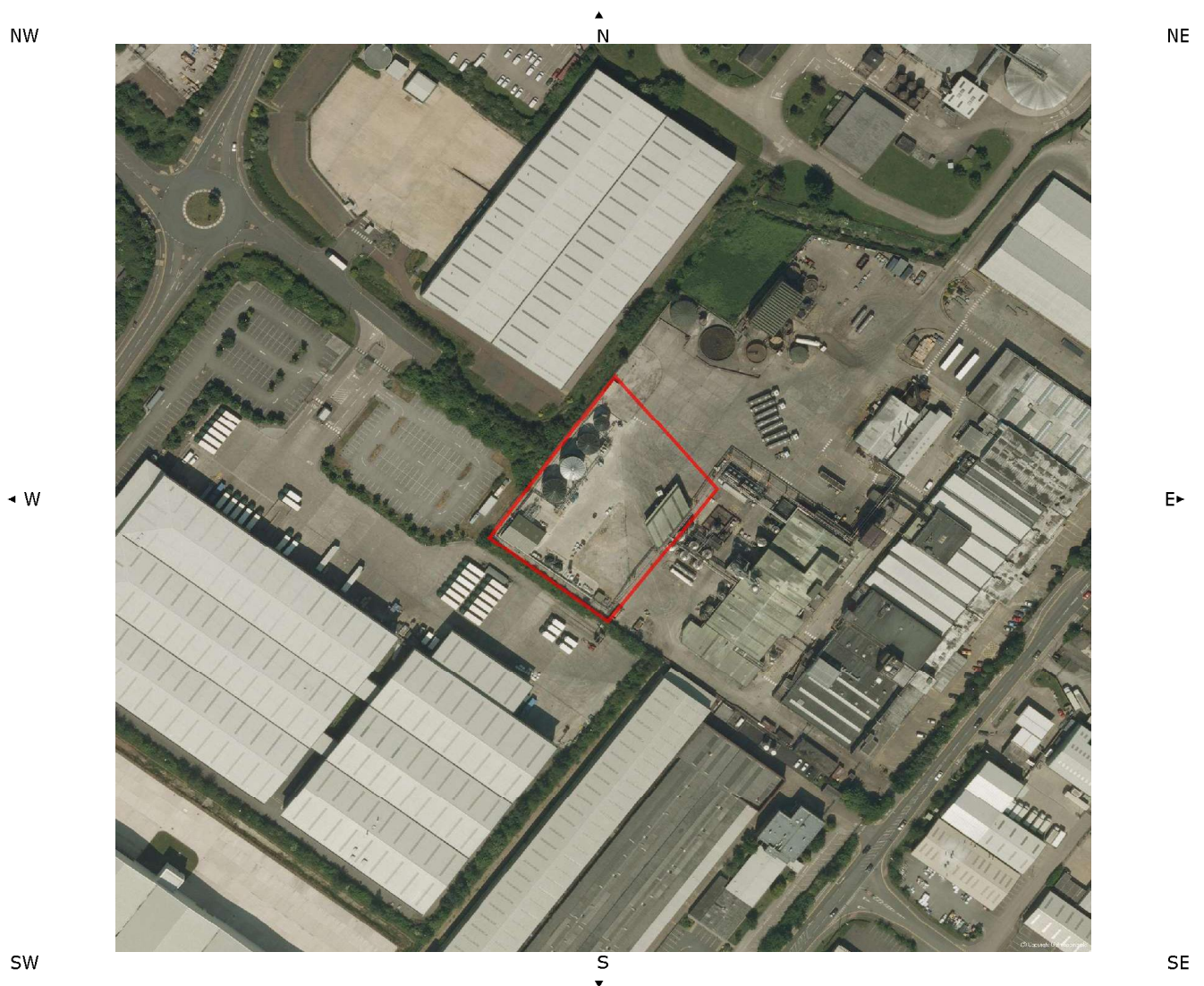
Report Reference: EMS-128225_175966

Your Reference: EMS_128225_175966



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Aerial Photograph of Study Site



Site Name: Unilever, Wellington Road, Burton-upon-Trent
Grid Reference: 423181,322582
Size of Site: 0.53 ha

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Overview of Findings

The GroundSure GeoInsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and GroundSure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the 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) m of the study site boundary
1. Geology	Description
1.1 Artificial Ground,	
1.1.1 Is there any Artificial Ground /Made Ground present beneath the study site?*	No
1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology & Landslips	
1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
1.2.2 Are there any records relating to permeability of superficial geology within the study site* boundary?	Yes
1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
1.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No
1.3 Bedrock, Solid Geology & Faults	
1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
1.3.2 Are there any records relating to permeability of bedrock within the study site* boundary?	Yes
1.3.3 Are there any records of faults within 500m of the study site boundary?	No
1.3.4 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 not in a Radon Affected Area, as less than 1% of properties are above the Action Level
1.3.5 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

* This includes an automatically generated 50m buffer zone around the site

Source:Scale 1:50,000 BGS Sheet No:140

2. Ground Workings	on-site	0-50	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	3	3	-	-
2.2 Historical Underground Workings Features from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	1	2	0	3

3. Mining, Extraction & Natural Cavities	on-site	0-50	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	1	0	1	2	5
3.4 Non-Coal Mining*	0	0	0	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	1
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

*This includes an automatically generated 50m buffer zone around the site

4. Natural Ground Subsidence	on-site*	0-50	51-250	251-500	501-1000
4.1 Shrink-Swell Clay	Negligible	-	-	-	-
4.2 Landslides	Very Low	-	-	-	-
4.3 Ground Dissolution of Soluble Rocks	Negligible	-	-	-	-
4.4 Compressible Deposits	Negligible	-	-	-	-
4.5 Collapsible Deposits	Very Low	-	-	-	-
4.6 Running Sand	Very Low	-	-	-	-

* This includes an automatically generated 50m buffer zone around the site

5. Borehole Records	on-site	0-50	51-250	251-500	501-1000
5.1 BGS Recorded Boreholes	0	0	11	-	-

6. Estimated Background Soil Chemistry	on-site	0-50	51-250	251-500	501-1000
6.1 Records of Background Soil Chemistry	1	0	0	-	-

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Material Safety Data Sheet

Hydrovane Fluid Force 2000hr Warranty Vane Lubricant**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING**

Material Name	CompAir Fluid Force 2000hr Warranty Vane Lubricant
Product Type/Use	Compressor oil.
Product Code	001B9895
Manufacturer/Supplier	Shell UK Oil Products Limited PO Box 3 Ellesmere Port CH65 4HB United Kingdom
Telephone:	+44-(0) 151-350-4000
Fax:	+44-(0) 151-350-4843
Emergency Tel:	+44-(0) 151-350-4595

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description	Highly refined mineral oils and additives.
Additional Information	The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

3. HAZARDS IDENTIFICATION

EC Classification	Not classified as dangerous under EC criteria.
Health Hazards	Not expected to be a health hazard when used under normal conditions. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis. Used oil may contain harmful impurities.
Signs and Symptoms	Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.
Safety Hazards	Not classified as flammable but will burn.
Environmental Hazards	Not classified as dangerous to the environment.



**Registered Office:
CompAir UK Limited
Springmill Street
Bradford
West Yorkshire
BD5 7HW
UNITED KINGDOM**

4. FIRST AID MEASURES

General Information	Not expected to be a health hazard when used under normal conditions.
Inhalation	No treatments necessary under normal conditions of use. If symptoms persist, obtain medical advice.
Skin	Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.
Eye Contact	Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
Ingestion	In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
Advice to Physician	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Clear fire areas of all non-emergency personnel

Specific Hazards	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds.
Extinguishing Media	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable Extinguishing Media	Do not use water in a jet.
Protective Equipment for Firefighters	Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe all relevant local and international regulations.

Protective measures	Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
Clean Up Methods	Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.
Additional Advice	Local authorities should be advised if significant spillages cannot be contained.



**Registered Office:
CompAir UK Limited
Springmill Street
Bradford
West Yorkshire
BD5 7HW
UNITED KINGDOM**

7. HANDLING AND STORAGE

General Precautions

Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.

Handling

Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used.

Storage

Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Storage Temperature: 0 - 50°C / 32 - 122°F
The storage of this product may be subject to the Control of Pollution (Oil Storage) (England) Regulations. Further guidance maybe obtained from the local environmental agency office.

Recommended Materials

For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials

PVC.

Additional Information :

Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion. Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication "COSHH Essentials".

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Occupational Exposure Limits

Exposure Controls

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

Personal Protective Equipment

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.



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Respiratory Protection

No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point <65 °C (149 °F)] meeting EN371.

Hand Protection

Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly.

Eye Protection

Application of a non-perfumed moisturizer is recommended. Wear safety glasses or full face shield if splashes are likely to occur. Approved to EU Standard EN166.

Protective Clothing

Skin protection not ordinarily required beyond standard issue work clothes.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.

Environmental Exposure Controls

Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.



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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Reddish. Liquid at room temperature.
Odour	: Slight hydrocarbon.
pH	: Not applicable.
Boiling point	: > 280 °C / 536 °F estimated value(s)
Pour point	: Typical -24 °C / -11 °F
Flash point	: Typical 240 °C / 464 °F (COC)
Explosion / Flammability limits in air	: Typical 1 - 10 %(V) (based on mineral oil)
Auto-ignition temperature	: > 320 °C / 608 °F
Vapour pressure	: < 0.5 Pa at 20 °C / 68 °F (estimated value(s))
Density	: Typical 890 kg/m ³ at 15 °C / 59 °F
Water solubility	: Negligible.
n-octanol/water partition coefficient (log Pow)	: > 6 (based on information on similar products)
Kinematic viscosity	: Typical 150 mm ² /s at 40 °C / 104 °F
Vapour density (air=1)	: > 1 (estimated value(s))
Evaporation rate (nBuAc=1)	: Data not available

10. STABILITY AND REACTIVITY

Stability	: Stable.
Conditions to Avoid	: Extremes of temperature and direct sunlight.
Materials to Avoid	: Strong oxidising agents.
Hazardous Decomposition Products	: Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on data on the components and the toxicology of similar products.
Acute Oral Toxicity	: Expected to be of low toxicity: LD50 >2000 mg/kg, Rat
Acute Dermal Toxicity	: Expected to be of low toxicity: LD50 >2000 mg/kg, Rabbit
Acute Inhalation Toxicity	: This product is not expected to pose an inhalation hazard under conditions of foreseeable use.
Skin Irritation	: Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as acne/folliculitis.
Eye Irritation	: Expected to be slightly irritating.
Respiratory Irritation	: Inhalation of vapours or mists may cause irritation.
Sensitisation	: Not expected to be a skin sensitiser.



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Repeated Dose Toxicity
Mutagenicity
Carcinogenicity

: Not expected to be a hazard.
: Not considered a mutagenic hazard.
: Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC). Other components are not known to be associated with Carcinogenic effects.

Reproductive and Developmental Toxicity
Additional Information

: Not expected to be a hazard.
: Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible.

12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Acute Toxicity

: Poorly soluble mixture. May cause physical fouling of Aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

Mobility

: Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

Persistence/degradability

: Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

Bioaccumulation

: Contains components with the potential to bioaccumulate.

Other Adverse Effects

: Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

13. DISPOSAL CONSIDERATIONS

Material Disposal

: Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.



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- Container Disposal** : Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
- Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations.
EU Waste Disposal Code (EWC): 13 02 05 mineral-based non-chlorinated engine, gear and lubricating oils. Classification of waste is always the responsibility of the end user.

14. TRANSPORT INFORMATION

ADR

This material is not classified as dangerous under ADR regulations.

RID

This material is not classified as dangerous under RID regulations.

ADNR

This material is not classified as dangerous under ADNR regulations.

IMDG

This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)

This material is not classified as dangerous under IATA regulations.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

- EC Classification : Not classified as dangerous under EC criteria.
EC Symbols : No Hazard Symbol required
EC Risk Phrases : Not classified.
EC Safety Phrases : Not classified.
EINECS : All components listed or polymer exempt.

TSCA : All components listed.

Other Information : Environmental Protection Act 1990 (as amended). Health and Safety at Work Act 1974. Consumers Protection Act 1987. Control of Pollution Act 1974. Environmental Act 1995. Factories Act 1961. Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations. Chemicals (Hazard Information and Packaging for Supply) Regulations 2002. Control of Substances Hazardous to Health Regulations 1994 (as amended). Road Traffic (Carriage of Dangerous Substances in Packages) Regulations.



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Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations. Road Traffic (Carriage of Dangerous Substances in Road Tankers in Tank Containers) Regulations. Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations. Health and Safety (First Aid) Regulations 1981. Personal Protective Equipment (EC Directive) Regulations 1992. Personal Protective Equipment at Work Regulations 1992.

16. OTHER INFORMATION

R-phrases(s)

Not classified.

- MSDS Version Number** : 1.1
MSDS Effective Date : 05.03.2007
MSDS Revisions : A vertical bar (|) in the left margin indicates an amendment from the previous version.
- MSDS Regulation** : The content and format of this safety data sheet is in accordance with Commission Directive 2001/58/EC of 27 July 2001, amending for the second time Commission Directive 91/155/EEC.
- MSDS Distribution** : The information in this document should be made available to all who may handle the product.
- Disclaimer** : This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.



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SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING



DiverseyLever

DiverseyLever Limited

Weston Favell Centre Northampton NN3 8PD Tel 01604 405311 Fax 01604 406809 Out of hours emergencies 01604 401273

Clearance Code

DIVOSAN HYPOCHLORITE

Product Code **626333**

TO :
THE COMPANY SECRETARY
BESTFOODS UK LTD
BURTON PLANT
WELLINGTON ROAD
BURTON-ON-TRENT
STAFFS
DE14 2AB

2. COMPOSITION / INFORMATION ON INGREDIENTS

CAS NO

Preparation containing : 7681-52-9 Sodium hypochlorite C: R31-34 (5-15%)

3. HAZARDS IDENTIFICATION

Corrosive - causes burns.
Contact with acids liberates toxic gas.

4. FIRST AID MEASURES

Eyes : Rinse immediately with copious amounts of water, holding the eyelids open and obtain immediate medical attention.
Inhalation : Remove from source of vapour or spray mist and seek immediate medical attention.
Skin : Flush the contaminated area with running water, remove contaminated clothing and wash before re-use. If irritation persists or there is any sign of tissue damage seek medical advice.
Ingestion : Remove product from mouth, give the casualty a small quantity of water to drink and obtain immediate medical attention. Do not induce vomiting.

5. FIRE FIGHTING MEASURES

NON FLAMMABLE - In the event of a fire due to other causes the product is compatible with water, foam, carbon dioxide and dry powder extinguishers. May evolve toxic fumes if involved in a fire. Firefighters should wear self contained breathing apparatus and suitable protective clothing including gloves and eye/face protection.

6. ACCIDENTAL RELEASE MEASURES

Wear suitable gloves and eye/face protection. Hose away with plenty of water diluting to at least 1% w/v (10 g/litre) unless this would contaminate a water course or vegetation, in which case either collect, dilute as earlier and pour down wastewater drain (foul sewer) or absorb onto dry sand or similar material and dispose of to a licensed waste management company.

7. HANDLING & STORAGE

Avoid contact with skin, eyes and clothing. Do not breathe vapour or spray mist. Wear suitable protective clothing, eye/face protection and rubber gloves when spraying this product or its use solutions. Do not mix with any other chemicals. Do not mix with acids.

Store upright in original closed containers in a cool place out of direct sunlight, ensuring that the vents remain effective. Keep out of reach of children. Keep away from food, drink and animal feeding stuffs. Keep away from acids.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Hand : Use gloves resistant to sodium hypochlorite.
Eyes : When handling neat product or concentrated solutions wear eye/face protection to prEN 166 3 (chemical liquids).
Skin : Wear protective overalls or bib resistant to alkalis.
Respiration : Personal protective equipment should only be considered where product containment or extract ventilation are impracticable, or for use in an emergency. For low levels of exposure (up to the maximum for which the respirator is designed) use a mask suitable for hazardous aqueous spray mists.

9. PHYSICAL & CHEMICAL PROPERTIES

Appearance :	Pale yellow/green liquid.	Odour :	Faint chlorine.
pH :	12	Solubility :	Miscible with water
Flammability :	Non flammable		

Date: 30/05/2001

Revision Number: -

Page: 1 of 2

10. STABILITY & REACTIVITY

Avoid excessively high temperatures or humidity. Keep out of direct sunlight. Keep away from acids. Contact with acids liberates chlorine. Hazardous decomposition products may include chlorine.

11. TOXICOLOGICAL INFORMATION

Eyes : Corrosive - causes burns.
Skin : Corrosive - causes burns.
Inhalation : Corrosive. Inhalation of use solutions in spray mist form will cause immediate irritation of the respiratory tract.
Ingestion : Corrosive.

12. ECOLOGICAL INFORMATION

Ingredients according to EC 89/542:
5% to 15% : Chlorine based bleaching agents.
The bleaching agents used in this product break down rapidly in the environment into harmless substances.

13. DISPOSAL CONSIDERATIONS

This product does not contain any prescribed substance under the Environmental Protection Act (Prescribed Processes and Substances) Regulations 1991 but is classified as special waste under the Control of Substances (Special Waste) Regulations 1996. For small quantities wear suitable gloves and eye/face protection. Dilute with water to at least 1% w/v (10 g/litre) and pour down a wastewater drain (foul sewer). Rinse out containers at least twice and recycle if facilities exist or dispose of as commercial waste. For larger quantities contact a licensed waste management company.

14. TRANSPORT INFORMATION

EEC Regulation : C, CORROSIVE, Sodium Hypochlorite, Solution, UN1791, Hazchem 2X.
IMDG/UN : Hypochlorite, Solution, UN1791, Class 8, PG III.
RID/ADR : Class 8, Item 61(c).
ICAO/IATA : Passenger Aircraft: 819, Y819
Cargo Aircraft: 821.

15. REGULATORY INFORMATION

Hazard symbol : C, CORROSIVE, Contains Sodium Hypochlorite.
Risk phrases : Causes burns.
Contact with acids liberates toxic gas.
Safety phrases : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
After contact with skin, wash immediately with plenty of water.
Wear suitable protective clothing, gloves and eye/face protection.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
Do not mix with acids

16. OTHER INFORMATION

Handle and apply only as recommended, for full information see product information sheet.

Internal Reference:-
Change to format of SDS

PRODUCT SAFETY DATA SHEET



SECTION 1: IDENTIFICATION

Product: **DISPELAIR DP 139** Revision: 21st February 2008
Type of Product: FOAM CONTROL AGENT
Producer: BLACKBURN CHEMICALS LTD
Address: Whitebirk Industrial Estate Telephone: +44(0)1254 52222
Blackburn Facsimile: +44(0)1254 664224
Lancashire, BB1 5SX Email: lab@bbchem.co.uk
U.K. **Emergency Telephone +44(0)1254 52222**

SECTION 2: HAZARDS IDENTIFICATION

This product is **not hazardous** according to EC criteria; however, prolonged and repeated skin contact causes defatting of the skin and may give rise to skin conditions including dermatitis.

SECTION 3: COMPOSITION

Component	Einecs No.	R. Phrase	Concentration Range
Odourless Kerosene	265-149-8	R 65	< 15%
Mineral Oil	265-169-7		< 40%

Workplace exposure values exist for the following constituent: Mineral Oil

SECTION 4: FIRST AID MEASURES

PRODUCT IN EYES: Rinse thoroughly with water for at least 15 minutes. Obtain medical attention
PRODUCT ON SKIN: Remove contaminated clothing. Wash thoroughly with soap and water.
PRODUCT INHALED: Under normal conditions of use no acute inhalation hazard is anticipated.
PRODUCT INGESTED: **DO NOT INDUCE VOMITING.** Obtain medical attention.

SECTION 5: FIRE FIGHTING MEASURES

Suitable extinguishing media: **carbon dioxide, foam, dry chemical powder, water spray. Do not use water jets.**
Cool tanks and containers exposed to fire with water.
Cover spills, which are not burning, with foam or sand.
Special protective equipment for fire fighters: **respiration and eye protection in case of smoke.**
In a fire this product will release oxides of carbon and hydrocarbon vapours.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Shut off source of spill if possible. Prevent entry into sewer or water course.
Absorb spilled liquid with sand or earth. Transfer to suitable clearly marked containers for disposal in accordance with national and local regulations.

SECTION 7: HANDLING AND STORAGE

HANDLING PRECAUTIONS: Handle in accordance with good industrial hygiene practices. Avoid contact with eyes and skin.
Wash hands thoroughly after contact.

STORAGE PRECAUTIONS: Store between 5°C and 30°C. Extremes of temperature may adversely affect the viscosity and stability of this product.

PRODUCT; DISPELAIR DP 139Revision: 21st February 2008

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**EXPOSURE LIMITS:** Mineral Oil mist 5mg/m³ (8hr TWA)**EXPOSURE CONTROLS:** Wear Nitrile rubber gloves and goggles or a visor to protect the eyes. Contaminated clothing should be changed as soon as reasonably practicable. Wash underlying skin with soap and water. Respiratory protection is unnecessary providing the concentration of mists and fumes are adequately controlled.

SECTION 9: TYPICAL PHYSICAL AND CHEMICAL PROPERTIES**Appearance:** Amber liquid
Odour: Characteristic
S.G.: Approx. 0.88 @ 20°C
Boiling Point: > 200 °C
Flash Point: > 75 °C (Does not support combustion at 55 °C)
Autoflammability: > 200°C
Explosive properties: Upper limit 8% ,lower limit 0.6%
Oxidising properties: Not applicable
Solubility in water: Forms a good emulsion
Viscosity: 30 cPs @ 20° C

SECTION 10: STABILITY AND REACTIVITY**Hazardous reactions:** None
Materials to avoid: Strong oxidising agents
Thermal decomposition products: Oxides of carbon, hydrocarbons and particulate matter.

SECTION 11: TOXICOLOGICAL INFORMATION**EYES:** Unlikely to cause more than transient stinging or redness if accidental eye contact occurs.
SKIN: Unlikely to cause harm to the skin on brief or occasional contact but prolonged or repeated contact may cause Dermatitis.
INHALATION: At normal ambient temperatures this product will be unlikely to present an inhalation hazard because of its low volatility.
INGESTION: This product has low systemic toxicity. If aspiration occurs (e.g. During vomiting) this can lead to intense irritation of the lung tissue, and chemically induced pneumonia.

SECTION 12: ECOLOGICAL INFORMATION**Ecotoxicity:**
Fish toxicity: > 10 mg/l *
Respiration inhibition:
EC50 > 1000 mg/l *
Biological elimination: > 80% *
Some constituents have a potential to bioaccumulate* Based on chemically similar product

PRODUCT: DISPELAIR DP 139

Revision: 21st February 2008

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of via an authorised waste disposal contractor in accordance with local regulations.
Incineration may be carried out under controlled conditions providing the local regulations for emissions are met.

SECTION 14: TRANSPORT INFORMATION

R.I.D. / A.D.R. class: None
I.A.T.A. class: None
I.M.D.G. class: None

SECTION 15: REGULATORY INFORMATION

EC labelling

- **Symbol (s)** None
- **R Phrase (s)** None
- **S Phrase (s)** None.

SECTION 16: OTHER INFORMATION

Changes:

The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.

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SAFETY DATA SHEET		Revision Date: 06.07.2010
		Print Date: 20.04.2011
Drewfloc™ 2585 POLYMER ™ Trademark, Ashland or its subsidiaries, registered in various countries 336019		MSDS Number: R0557333 Version: 2.0

Conforms to EU Directive 1907/2006/EC - MSDS_UA

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Ashland P.O. Box 8619 NL3009 AP, Rotterdam Netherlands EUSMT@ashland.com	Emergency telephone +1-800-ASHLAND (+1-800-274-5263/+1-606-329-5701) , or contact your local emergency telephone number at 112 Product Information +31 10 497 5000 (in the Netherlands), or contact your local CSR contact person
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Product name Drewfloc™ 2585 POLYMER
 ™ Trademark, Ashland or its subsidiaries, registered in various countries
Product code 336019
Product Use Description Flocculating agent

2. HAZARDS IDENTIFICATION

Not a hazardous substance or mixture according to EC-directives 67/548/EEC or 1999/45/EC.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components	CAS-No.	EINECS-No.	Concentration	Symbol(s)	R-phrase(s)
Distillates (Petroleum), Hydrotreated Middle	64742-46-7	265-148-2	>=15 - <25%	Xn	R65
Ethoxylated alcohols (C12-18)	68213-23-0		>=2,5 - <5%	Xi N	R41 R50

For the full text of the R-phrases mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

General Information

First aid is not normally required. If symptoms develop, seek medical attention.

Eyes

Flush eyes with water at least 15 minutes. Get medical attention if eye irritation develops or persists. Remove contact lenses.

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Skin

Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water.

Ingestion

Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

Inhalation

Move to fresh air. If symptoms persist, call a physician. In case of shortness of breath, give oxygen.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

ABC powder, Water mist, Carbon dioxide (CO₂), Dry chemical

Unsuitable extinguishing media

DO NOT USE: Halons

Hazardous combustion products

Carbon oxides, nitrogen oxides (NO_x)

Thermal decomposition

no data available

Precautions for fire-fighting

Do not allow run-off from fire fighting to enter drains or water courses. Keep containers and surroundings cool with water spray. Prevent fire extinguishing water from contaminating surface water or the ground water system. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Personal protective equipment

In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Material can create slippery conditions.

Environmental precautions

Prevent further leakage or spillage if safe to do so.

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Methods for cleaning up

Neutralize with chalk, alkali solution or ammonia. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Large spills should be collected mechanically (remove by pumping) for disposal. Keep in suitable, closed containers for disposal.

Other information

Comply with all applicable federal, state, and local regulations. Forms slippery/greasy layers with water.

7. HANDLING AND STORAGE

Handling

Do not breathe vapours or spray mist. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. No special handling advice required. Normal measures for preventive fire protection.

Storage

Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Stable under recommended storage conditions. Protect from frost.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

General advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities. Ensure that eyewash stations and safety showers are close to the workstation location.

Exposure controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below level of overexposure (from known, suspected or apparent adverse effects).

Eye protection

Safety glasses with side-shields

Skin and body protection

Wear as appropriate:

Safety shoes

Wear resistant gloves (consult your safety equipment supplier).

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Respiratory protection

No personal respiratory protective equipment normally required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Form	no data available
Colour	white
Odour	hydrocarbon-like
Boiling point/boiling range	98,00 °C
Melting point/range	-15 °C
Sublimation point	no data available
pH	4@ 10 g/L
Flash point	(>)100,00 °C, Closed Cup
Ignition temperature	no data available
Evaporation rate	no data available
Lower explosion limit / Upper explosion limit	no data available
Dust explosion class	no data available
Dust explosion constant	no data available
Burning number	no data available
Particle size	no data available
Vapour pressure	no data available
Vapour density	no data available
Density	1,03 g/cm ³ @ 68 °F / 20 °C
Bulk density	no data available
Solubility	Water soluble
Partition coefficient: n-octanol/water	no data available
log Pow	no data available
Autoignition temperature	no data available
Viscosity, dynamic	(<)4.000 mPa.s @ 20 °C
Viscosity, kinematic	(>)7 mm ² /s @ 40 °C
Hydrolysis	no data available
Physico-chemical removability	no data available

10. STABILITY AND REACTIVITY

Stability

No hazards to be specially mentioned.

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Conditions to avoid

Exposure to moisture.

Incompatible products

Acids

Hazardous decomposition products

Carbon oxides, nitrogen oxides (NOx)

Hazardous reactions

Hazardous polymerisation does not occur.

11. TOXICOLOGICAL INFORMATION

Exposure routes

Skin contact, Eye Contact, Ingestion

Eye contact

no data available

Skin contact

According to the classification criteria of the European Union, the product is not considered as being a skin irritant.

Ingestion

Not known to be harmful if swallowed.

Inhalation

Not known to be harmful if inhaled.

Aggravated Medical Condition

no data available

Symptoms

no data available

Target Organs

no data available

Acute oral toxicity : LD50 mouse: > 5.000,000000 mg/kg

Acute inhalation toxicity

Distillates (Petroleum), Hydrotreated Middle (64742- : no data available

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46-7)
Ethoxylated alcohols (C12-18) (68213-23-0) : no data available

Acute dermal toxicity

Distillates (Petroleum), Hydrotreated Middle (64742-46-7) : no data available
Ethoxylated alcohols (C12-18) (68213-23-0) : no data available

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

Biodegradability

Distillates (Petroleum), Hydrotreated Middle (64742-46-7) : no data available

Ethoxylated alcohols (C12-18) (68213-23-0) : **Biochemical oxygen demand: 98 %**

Physico-chemical removability : The product can be eliminated from water by abiotic processes, e.g. adsorption on activated sludge.

Bioaccumulation : The bioaccumulation potential cannot be determined.

Ecotoxicity effects

Toxicity to fish : 96 h LC50 Danio rerio (zebra fish): 1,000 - 10,000 mg/L
Method: OECD Test Guideline 203 Information refers to the main component.

Toxicity to daphnia and other aquatic invertebrates. : 48 h EC50 Daphnia magna (Water flea): (>) 19,000 mg/L
Method: OECD Test Guideline 202 Information refers to the main component.

Toxicity to algae

Distillates (Petroleum), Hydrotreated Middle (64742-46-7) : no data available
Ethoxylated alcohols (C12-18) (68213-23-0) : no data available

Toxicity to bacteria : 48 h EC 50 Pseudomonas putida: (ca.) 10,000 mg/L
Information refers to the main component.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

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SAFETY DATA SHEET		Revision Date: 06.07.2010
		Print Date: 20.04.2011
Drewfloc™ 2585 POLYMER ™ Trademark, Ashland or its subsidiaries, registered in various countries 336019		MSDS Number: R0557333 Version: 2.0

Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Empty packaging

Empty remaining contents.

European Waste Catalogue

The Waste code should be assigned in discussion between the user and the waste disposal company.

14. TRANSPORT INFORMATION

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.
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ADR

Not dangerous goods

ADNR

Not dangerous goods

RID

Not dangerous goods

INTERNATIONAL MARITIME DANGEROUS GOODS

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

Not dangerous goods

*ORM = ORM-D, CBL = COMBUSTIBLE LIQUID

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

15. REGULATORY INFORMATION

ASHLAND		Page: 8 of 8
SAFETY DATA SHEET		Revision Date: 06.07.2010
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Drewfloc™ 2585 POLYMER ™ Trademark, Ashland or its subsidiaries, registered in various countries 336019		MSDS Number: R0557333 Version: 2.0

Hazard symbols

none

R-phrases(s)

none

S-phrases(s)

none

Special labelling of certain mixtures

1999/45/EC

Safety data sheet available for professional user on request.

Notification status

US. Toxic Substances Control Act	y (positive listing)
Australia. Industrial Chemical (Notification and Assessment) Act	y (positive listing)
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133)	n (Negative listing)
Japan. Kashin-Hou Law List	n (Negative listing)
Korea. Toxic Chemical Control Law (TCCL) List	y (positive listing)
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	n (Negative listing)
China. Inventory of Existing Chemical Substances	y (positive listing)
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	n (Negative listing)

16. OTHER INFORMATION

Full text of R-phrases referred to under sections 2 and 3

R65	Harmful: may cause lung damage if swallowed.
R41	Risk of serious damage to eyes.
R50	Very toxic to aquatic organisms.

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by Ashland's Environmental Health and Safety Department (+31 10 497 5000).

Safety data sheet
EU Nr. 453/2010

Printing date 06.04.2011

Revision: 06.10.2008

1 Identification of the substance/mixture and of the company/undertaking

- *Product identifier*
- *Trade name:* **FERRIC CHLORIDE 40% SOLUTION 1444 KG**
- *Article number:* 420001950
- *CAS Number:* 7705-08-0
- *EINECS Number:* 231-729-4
- *Relevant identified uses of the substance or mixture and uses advised against*
- *Application of the substance / the preparation -*
- *Details of the supplier of the safety data sheet*
- *Manufacturer/Supplier:*
Caldic UK
Stainsby Close, Holmewood I. E.
Chesterfield, Derbyshire S42 5UG, UK
Tel. +44 1246 854111
- *Further information obtainable from:* Cel QHSE
- *Emergency telephone number:* Info centre of dangerous goods (BIG): +32(0)14.58.45.45

2 Hazards identification

- *Classification of the substance or mixture*
- *Classification according to Regulation (EC) No 1272/2008*



GHS05 corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Eye Dam. 1 H318 Causes serious eye damage.



GHS07

Acute-Tox. 4 H302 Harmful if swallowed.
Aquatic Chronic 3 H412 Harmful to aquatic life with long lasting effects.

- *Classification according to Directive 67/548/EEC or Directive 1999/45/EC*



C; Corrosive

R34: Causes burns.



Xn; Harmful

R22: Harmful if swallowed.



Xi; Irritant

R38-41: Irritating to skin. Risk of serious damage to eyes.

R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

(Contd. on page 2)

GB

Safety data sheet
EU Nr. 453/2010

Printing date 06.04.2011

Revision: 06.10.2008

Trade name: FERRIC CHLORIDE 40% SOLUTION 1444 KG

(Contd. of page 1)

- **Label elements**
- **Labelling according to Regulation (EC) No 1272/2008**
The substance is classified and labelled according to the CLP regulation.
- **Hazard pictograms GHS05, GHS07**
- **Signal word Danger**
- **Hazard statements**
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H412 Harmful to aquatic life with long lasting effects.
- **Precautionary statements**
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing.
Rinse skin with water/shower.
P310 Immediately call a POISON CENTER or doctor/physician.
P321 Specific treatment (see on this label).
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
- **Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT: Not applicable.**
- **vPvB: Not applicable.**

3 Composition/information on ingredients

- **Chemical characterization: Substances**
- **CAS No. Description**
7705-08-0 iron trichloride
- **Identification number(s)**
- **EINECS Number: 231-729-4**

4 First aid measures

- **Description of first aid measures**
- **General information:**
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:**
Immediately wash with water and soap and rinse thoroughly.
Call a doctor immediately.
- **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing:**
Rinse out mouth and then drink plenty of water.

(Contd. on page 3)

GB

Safety data sheet EU Nr. 453/2010

Printing date 06.04.2011

Revision: 06.10.2008

Trade name: **FERRIC CHLORIDE 40% SOLUTION 1444 KG**

(Contd. of page 2)

Call for a doctor immediately.

5 Firefighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Advice for firefighters**
- **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures** Not required.
- **Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** Store in cool, dry place in tightly closed receptacles.
- **Information about fire - and explosion protection:** No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**

7705-08-0 iron trichloride

WEL ()	Short-term value: 2 mg/m ³
	Long-term value: 1 mg/m ³
	as Fe

- **Additional information:** The lists valid during the making were used as basis.

(Contd. on page 4)

GB

Safety data sheet

EU Nr. 453/2010

Printing date 06.04.2011

Revision: 06.10.2008

Trade name: **FERRIC CHLORIDE 40% SOLUTION 1444 KG**

(Contd. of page 3)

- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
 Keep away from foodstuffs, beverages and feed.
 Immediately remove all soiled and contaminated clothing
 Wash hands before breaks and at the end of work.
 Avoid contact with the skin.
 Avoid contact with the eyes and skin.
- **Respiratory protection:** Not required.
- **Protection of hands:**



Protective gloves

- **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

- **Information on basic physical and chemical properties**

- **General Information**

- **Appearance:**

Form:	Powder
Colour:	Dark grey
Odour:	Weak, characteristic

- **Change in condition**

Melting point/Melting range: 306, Zers. °C
 Boiling point/Boiling range: Undetermined.

- **Flash point:** Not applicable.

- **Danger of explosion:** Product does not present an explosion hazard.

- **Vapour pressure at 20°C:** 1 hPa

- **Density at 20°C:** 2.898 g/cm³

- **Solubility in / Miscibility with water at 20°C:** 920 g/l

10 Stability and reactivity

- **Reactivity**
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
 No decomposition if used according to specifications.

(Contd. on page 5)

GB

Safety data sheet

EU Nr. 453/2010

Printing date 06.04.2011

Revision: 06.10.2008

Trade name: **FERRIC CHLORIDE 40% SOLUTION 1444 KG**

(Contd. of page 4)

- Possibility of hazardous reactions *No dangerous reactions known.*
- Hazardous decomposition products: *No dangerous decomposition products known.*

11 Toxicological information

- Information on toxicological effects
- Acute toxicity:

· LD/LC50 values relevant for classification:

Oral	LD50	1872 mg/kg (rat)
------	------	------------------

- Primary irritant effect:
 - on the skin: *Irritant to skin and mucous membranes.*
 - on the eye: *Strong irritant with the danger of severe eye injury.*
- Sensitization: *No sensitizing effects known.*

12 Ecological information

- Toxicity
- Aquatic toxicity: *No further relevant information available.*
- Behaviour in environmental systems:
- Bioaccumulative potential *No further relevant information available.*
- Additional ecological information:
- General notes:
 - Water hazard class 1 (German Regulation) (Assessment by list): slightly hazardous for water*
 - Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.*
- Results of PBT and vPvB assessment
- PBT: *Not applicable.*
- vPvB: *Not applicable.*

13 Disposal considerations

- Waste treatment methods
- Recommendation
 - Must not be disposed together with household garbage. Do not allow product to reach sewage system.*
- Uncleaned packaging:
 - Recommendation: *Disposal must be made according to official regulations.*
 - Recommended cleansing agents: *Water, if necessary together with cleansing agents.*

(Contd. on page 6)

GB

Safety data sheet EU Nr. 453/2010

Printing date 06.04.2011

Revision: 06.10.2008

Trade name: **FERRIC CHLORIDE 40% SOLUTION 1444 KG**

(Contd. of page 5)

14 Transport information

· Land transport ADR/RID (cross-border)



- ADR/RID class: 8 Corrosive substances.
- Danger code (Kemler): 80
- UN-Number: 1773
- Packaging group: III
- Hazard label 8
- UN proper shipping name: 1773 FERRIC CHLORIDE, ANHYDROUS
- Tunnel restriction code E

· Maritime transport IMDG:



- IMDG Class: 8
- UN Number: 1773
- Label 8
- Packaging group: III
- EMS Number: F-A,S-B
- Segregation groups Acids
- Proper shipping name: FERRIC CHLORIDE, ANHYDROUS

· Air transport ICAO-TI and IATA-DGR:



- ICAO/IATA Class: 8
- UN/ID Number: 1773
- Label 8
- Packaging group: III
- Proper shipping name: FERRIC CHLORIDE, ANHYDROUS

- UN "Model Regulation": UN1773, FERRIC CHLORIDE, ANHYDROUS, 8, III
- Special precautions for user Warning: Corrosive substances.

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- National regulations:
- Waterhazard class: Water hazard class 1 (Assessment by list): slightly hazardous for water.

(Contd. on page 7)

GB

Safety data sheet EU Nr. 453/2010

Printing date 06.04.2011

Revision: 06.10.2008

Trade name: **FERRIC CHLORIDE 40% SOLUTION 1444 KG**

(Contd. of page 6)

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

" The information provided in these documents is based on our present state of knowledge of the product and is given in good faith and to the best of our experience. However, it should not be construed as a technical specification or as guaranteeing specific properties. In no event we will be responsible for damages or effects of any nature whatsoever, either express or implied, resulting from the use of this information. It is the own responsibility of the consignee and the user of the product to comply with all prevailing and applicable laws, regulations and directives. They should also make their own determination as to the suitability of the product for a particular use or application. "

· **Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

· *** Data compared to the previous version altered.**

GB



SAFETY DATA SHEET

Page 1 of 3

GENESOL 38

Revision 0
Revision date 26-Nov-2007

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND THE COMPANY

Product name GENESOL 38
Company Genesys International Limited
Unit 4, Ion Path, Road One
Winsford Industrial Estate
Winsford, Cheshire
CW7 3RG
factory@genesysro.com
www.genesysro.com
Telephone +44 1628 667 605
Fax +44 1628 667 492
Emergency telephone number +44 1606 593 090

2. COMPOSITION / INFORMATION ON INGREDIENTS

Description Partially neutralised aqueous solution of polycarboxylic acid.

3. HAZARDS IDENTIFICATION

Main hazards No Significant Hazard.
Other hazards The product is classified as non hazardous.

4. FIRST AID MEASURES

Skin contact Wash with water. Remove contaminated clothing.
Eye contact May cause irritation to eyes. Rinse immediately with plenty of water for 15 minutes holding the eyelids open. Seek medical attention if irritation or symptoms persist.
Inhalation Considered to be not hazardous by inhalation.
Ingestion Rinse mouth thoroughly. DO NOT INDUCE VOMITING. Seek medical attention if irritation or symptoms persist.

5. FIRE FIGHTING MEASURES

Extinguishing media Use extinguishing media appropriate to the surrounding fire conditions. Carbon dioxide (CO₂) Dry chemical. Foam. Water spray.
Protective equipment Wear suitable respiratory equipment when necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions Avoid contact with skin and eyes.
Environmental precautions Do not allow product to enter drains. Prevent further spillage if safe.
Clean up methods Absorb with inert, absorbent material. Sweep up. Transfer to suitable, labelled containers for disposal. Clean spillage area thoroughly with plenty of water. Dispose of in compliance with all local and national regulations.

Print date 26-Nov-2007

GENESOL 38Revision 0
Revision date 26-Nov-2007**7. HANDLING AND STORAGE**

Handling	Avoid contact with skin and eyes. Adopt best Manual Handling considerations when handling, carrying and dispensing. Ensure adequate ventilation of the working area.
Storage	Store in a cool, dry area. Keep containers tightly closed.
Suitable packaging	Plastic containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures	Ensure adequate ventilation of the working area.
Respiratory protection	Not normally required.
Hand protection	Chemical resistant gloves (PVC)
Eye protection	Approved safety goggles.
Protective equipment	Wear protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Description	Liquid.
Colour	Yellow. Clear.
Odour	Slight.
pH	3.5 - 4.0
Boiling point	102°C
Relative density	1.18 - 1.20
Freezing Point	0°C

10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions.
Hazardous decomposition products	None.

11. TOXICOLOGICAL INFORMATION

Corrosivity	No irritation expected.
Sensitization	No sensitization effects reported.
Mutagenic effects	No mutagenic effects reported.
Carcinogenic effects	No carcinogenic effects reported.
Reproductive toxicity	No teratogenic effects reported.

12. ECOLOGICAL INFORMATION**13. DISPOSAL CONSIDERATIONS**

General information	Dispose of in compliance with all local and national regulations.
Disposal methods	Contact a licensed waste disposal company. Dispose of in compliance with all local and national regulations. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.
Disposal of packaging	Empty containers can be cleaned with water. Empty containers can be sent for disposal or recycling.

14. TRANSPORT INFORMATION

Further information	The product is not classified as dangerous for carriage.
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GENESOL 38Revision 0
Revision date 26-Nov-2007**15. REGULATORY INFORMATION**

Risk phrases NSH - No Significant Hazard.
Safety phrases S24/25 - Avoid contact with skin and eyes.

16. OTHER INFORMATION

Further information The information supplied in this Safety Data Sheet is designed only as guidance for the safe use, storage and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication however no guarantee is made to its accuracy. This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process.



SAFETY DATA SHEET

Page 1 of 3

GENESYS LF

Revision 0
Revision date 19-Dec-2007

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND THE COMPANY

Product name GENESYS LF
Company Genesys International Limited
Unit 4, Ion Path, Road One
Winsford Industrial Estate
Winsford, Cheshire
CW7 3RG
factory@genesysro.com
www.genesysro.com
Telephone +44 1628 667 605
Fax +44 1628 667 492
Emergency telephone number +44 1606 593 090

2. COMPOSITION / INFORMATION ON INGREDIENTS

Description Aqueous solution of neutralised phosphonic acid.

3. HAZARDS IDENTIFICATION

Main hazards No Significant Hazard.
Other hazards The product is classified as non hazardous.

4. FIRST AID MEASURES

Skin contact Wash with water. Remove contaminated clothing.
Eye contact May cause irritation to eyes. Rinse immediately with plenty of water for 15 minutes holding the eyelids open. Seek medical attention if irritation or symptoms persist.
Inhalation Considered to be not hazardous by inhalation.
Ingestion Rinse mouth thoroughly. DO NOT INDUCE VOMITING. Seek medical attention if irritation or symptoms persist.

5. FIRE FIGHTING MEASURES

Extinguishing media Use extinguishing media appropriate to the surrounding fire conditions. Carbon dioxide (CO₂) Dry chemical. Foam. Water spray.
Protective equipment Wear suitable respiratory equipment when necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions Ensure adequate ventilation of the working area.
Environmental precautions Do not allow product to enter drains. Prevent further spillage if safe.
Clean up methods Absorb with inert, absorbent material. Sweep up. Transfer to suitable, labelled containers for disposal. Clean spillage area thoroughly with plenty of water. Dispose of in compliance with all local and national regulations.

Print date 19-Dec-2007

GENESYS LFRevision 0
Revision date 19-Dec-2007**7. HANDLING AND STORAGE**

Handling	Avoid contact with eyes and skin. Ensure adequate ventilation of the working area. Adopt best Manual Handling considerations when handling, carrying and dispensing.
Storage	Store in a cool, dry area.
Suitable packaging	Plastic containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures	Ensure adequate ventilation of the working area.
Respiratory protection	Not normally required.
Hand protection	Chemical resistant gloves (PVC)
Eye protection	Approved safety goggles.
Protective equipment	Wear protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Description	Liquid.
Colour	Yellow. Clear.
Odour	Characteristic.
pH	9.8 - 10.2
Relative density	1.32 - 1.34
Freezing Point	<-5°C

10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions.
Conditions to avoid	Avoid contact with: oxidising agents.
Materials to avoid	Aluminium. Zinc.

11. TOXICOLOGICAL INFORMATION

Toxicological information

GENESYS LF Oral Rat LD50 = >30,000 mg/kg

Sensitization	No sensitization effects reported.
Mutagenic effects	No mutagenic effects reported.
Carcinogenic effects	No carcinogenic effects reported.
Reproductive toxicity	No teratogenic effects reported.

12. ECOLOGICAL INFORMATION

Ecotoxicity

GENESYS LF

Green algae EC50/96h = 20 mg/l
Rainbow trout LC50/96h = >330 mg/l
Bluegill sunfish LC50/96h = >300 mg/l

GENESYS LF

Revision 0
Revision date 19-Dec-2007

13. DISPOSAL CONSIDERATIONS

General information	Dispose of in compliance with all local and national regulations.
Disposal methods	Contact a licensed waste disposal company. Dispose of in compliance with all local and national regulations. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.
Disposal of packaging	Empty containers can be cleaned with water. Empty containers can be sent for disposal or recycling.

14. TRANSPORT INFORMATION

Further information	The product is not classified as dangerous for carriage.
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15. REGULATORY INFORMATION

Risk phrases	NSH - No Significant Hazard.
Safety phrases	S24/25 - Avoid contact with skin and eyes.

16. OTHER INFORMATION

Further information	The information supplied in this Safety Data Sheet is designed only as guidance for the safe use, storage and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication however no guarantee is made to its accuracy. This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process.
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SAFETY DATA SHEET
HYDROCHLORIC ACID 28%

Page 1
Issued:
Revision No: 1

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product name: HYDROCHLORIC ACID 28%

Use / description of product: Corrosive.

Company name: Lindchem Ltd
29 North River Road
Great Yarmouth
Norfolk
NR30 1SH
United Kingdom
Tel: +44 (0) 1493 332 286
Fax: +44 (0) 1493 330 909
Emergency tel: +44 (0) 1493 850 808

2. COMPOSITION / INFORMATION ON INGREDIENTS

3. HAZARDS IDENTIFICATION

Main hazards: Causes burns. Irritating to respiratory system.

4. FIRST AID MEASURES (SYMPTOMS)

Skin contact: Blistering may occur. Progressive ulceration will occur if treatment is not immediate.

Eye contact: Corneal burns may occur. May cause permanent damage.

Ingestion: Corrosive burns may appear around the lips. Blood may be vomited. There may be bleeding from the mouth or nose.

Inhalation: There may be shortness of breath with a burning sensation in the throat. Exposure may cause coughing or wheezing.

4. FIRST AID MEASURES (ACTION)

Skin contact: Remove all contaminated clothes and footwear immediately unless stuck to skin. Drench the affected skin with running water for 10 minutes or longer if substance is still on skin. Transfer to hospital if there are burns or symptoms of poisoning.

Eye contact: Bathe the eye with running water for 15 minutes. Transfer to hospital for specialist examination.

Ingestion: Wash out mouth with water. Do not induce vomiting. Give 1 cup of water to drink every 10 minutes. If unconscious, check for breathing and apply artificial respiration if necessary. If unconscious and breathing is OK, place in the recovery position. Transfer to hospital as soon as possible.

Inhalation: Remove casualty from exposure ensuring one's own safety whilst doing so. If unconscious and breathing is OK, place in the recovery position. If conscious, ensure the casualty sits or lies down. If breathing becomes bubbly, have the casualty sit and provide oxygen if available. Transfer to hospital as soon as possible.

[cont...]

5. FIRE-FIGHTING MEASURES

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

Exposure hazards: Corrosive. In combustion emits toxic fumes.

Protection of fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Notify the police and fire brigade immediately. If outside keep bystanders upwind and away from danger point. Mark out the contaminated area with signs and prevent access to unauthorised personnel. Do not attempt to take action without suitable protective clothing - see section 8 of SDS. Turn leaking containers leak-side up to prevent the escape of liquid.

Environmental precautions: Do not discharge into drains or rivers. Contain the spillage using bunding.

Clean-up procedures: Clean-up should be dealt with only by qualified personnel familiar with the specific substance. Absorb into dry earth or sand. Transfer to a closable, labelled salvage container for disposal by an appropriate method.

7. HANDLING AND STORAGE

Handling requirements: Avoid direct contact with the substance. Ensure there is sufficient ventilation of the area. Do not handle in a confined space. Avoid the formation or spread of mists in the air.

Storage conditions: Store in cool, well ventilated area. Keep container tightly closed.

Suitable packaging: Must only be kept in original packaging.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Occupational exposure limits**

STEL (15 min exposure limit): 7.6 mg/m³ (OES)

Engineering measures: Ensure there is sufficient ventilation of the area.

Respiratory protection: Self-contained breathing apparatus must be available in case of emergency.

Hand protection: Impermeable gloves. PVC gloves.

Eye protection: Tightly fitting safety goggles. Ensure eye bath is to hand.

Skin protection: Protective clothing, PVC. Boots made of PVC. Ensure safety shower is to hand.

9. PHYSICAL AND CHEMICAL PROPERTIES

State: Liquid

Colour: Pale yellow

Odour: Pungent

Evaporation rate: Slow

Oxidising: Non-oxidising (by EC criteria)

Solubility in water: Miscible

Also soluble in: Ethanol. Diethyl ether. Benzene.

SAFETY DATA SHEET
HYDROCHLORIC ACID 28%

Viscosity: Viscous
Boiling point/range°C: 110
Melting point/range°C: -29
Relative density: 1.16
pH: <1

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions.
Conditions to avoid: Heat.
Materials to avoid: Bases. Strong oxidising agents. Strong acids. Reducing agents. Amines.
Haz. decomp. products: In combustion emits toxic fumes.

11. TOXICOLOGICAL INFORMATION

Routes of exposure: Refer to section 4 of SDS for routes of exposure and corresponding symptoms.

12. ECOLOGICAL INFORMATION

Mobility: Readily absorbed into soil.
Persistence and degradability: Biodegradable.
Bioaccumulative potential: No bioaccumulation potential.
Other adverse effects: Negligible ecotoxicity.

13. DISPOSAL CONSIDERATIONS

Disposal of packaging: Arrange for collection by specialised disposal company.
NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

14. TRANSPORT INFORMATION**ADR / RID**

UN no: 1789	ADR Class: 8
Packing group: II	Classification code: C1
Shipping name: HYDROCHLORIC ACID	
Labelling: 8	Hazard ID no: 80

**IMDG / IMO**

UN no: 1789	Class: 8
Packing group: II	EmS: 8-03
Marine pollutant: NO	Labelling: 8

SAFETY DATA SHEET
HYDROCHLORIC ACID 28%**IATA / ICAO**

UN no: 1789 **Class:** 8
Packing group: II **Packing instructions:** 809(P&CA); 813(PAO)
Labelling: 8

15. REGULATORY INFORMATION

Hazard symbols: Corrosive.



Risk phrases: R34: Causes burns.
R37: Irritating to respiratory system.

Safety phrases: S23: Do not breathe vapour.
S24/25: Avoid contact with skin and eyes.
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28: After contact with skin, wash immediately with plenty of water.
S36/37/39: Wear suitable protective clothing, gloves and eye / face protection.
S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Note: The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the safety data sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.



ENVIRONMENTAL LTD

Riverside Industrial Estate,
Estuary Road,
Kings Lynn, Norfolk, PE30 2HH
Telephone: (01553) 770092
Fax: (01553) 776547

SAFETY DATA SHEET

1.	<u>IDENTIFICATION OF SUBSTANCE/PREPARATION:</u> NUTROMEX N: Code 501
2.	<u>COMPOSITION/INFORMATION ON INGREDIENTS:</u> Substance: Mixture of Urea and Ammonium Nitrate containing 30 % Nitrogen.
3.	<u>HAZARDS IDENTIFICATION:</u> None required. Health effect: None reported.
4.	<u>FIRST AID MEASURES:</u> Skin and eyes: Irrigate eyes well with water. Wash skin with soap and water Ingestion: Drink water. Do not induce vomiting. Seek medical advice. Inhalation: Remove to fresh air.
5.	<u>FIRE FIGHTING MEASURES:</u> Product is non-flammable.
6.	<u>ACCIDENTAL RELEASE MEASURES:</u> Small spillages should be diluted with water promptly. Spillages of Nutromex should be hosed down with water. Take care to avoid contamination of sewer or water courses and inform the appropriate water company if necessary.
7.	<u>HANDLING AND STORAGE:</u> Products should be stored in vessels designed for that purpose. Tanks or storage areas should be adequately banded. Stores should be located away from sources of heat fire or explosion.
8.	<u>EXPOSURE CONTROLS/PERSONAL PROTECTION:</u> Respiratory protection: Not necessary Protective equipment: Wear standard equipment, gloves when handling the product over long periods of time, eye protection. Special equipment: None

9. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance:	Clear or slight yellow/green liquid
Odour:	None or slight smell of organic.
pH:	Neutral, 6.5 - 7.5
Boiling Point:	101 °C
Flash Point:	None

10. STABILITY AND REACTIVITY:

Stability:	Mainly inert in character
Conditions to avoid:	Extremes of temperature
Incompatibility:	Liberates ammonia when mixed with concentrated alkali
Hazardous decomposition products:	Ultimate thermal decomposition products are ammonia and oxides of nitrogen.

11. TOXICOLOGICAL INFORMATION:

Essentially non-toxic.

12. ECOLOGICAL INFORMATION:

May cause algal bloom if released to water course.

13. DISPOSAL CONSIDERATIONS:

If not usable as a fertiliser, dispose to landfill in accordance with local authority regulations.

14. TRANSPORT INFORMATION:

Not regulated.

15. REGULATORY INFORMATION:

None required.

16. OTHER INFORMATION:

This information is based on the health and safety requirements for the intended use of the product.

BRITISH SALT

Safety Data Sheet for all grades of Vacuum Salt (Sodium Chloride) (also applicable to all grades of compacted products)

1. Identification of the substance/preparation and of the company/undertaking

1.1 Product identifier

Trade Name : Salt
Substance Name : Sodium Chloride

1.2 Relevant identified uses of the substance/preparation and uses advised against

Uses of the substance/preparation : Chemical manufacture, food industry,
animal feed industry, water treatment
Uses advised against : Reacts with strong sulphuric acid or
nitric acid to give hydrogen chloride gas

1.3 Details of supplier of the safety data sheet

Address/Telephone No. : As on letterhead
Email : Lab@british-salt.co.uk

1.4 Emergency telephone No.

Emergency telephone : 01606-832881 (Office Hours)
: 01606-839241 (Out of Hours)

2. Hazards identification

EC Classification : Not classified as Dangerous according to
EC Directive 67/548/EEC
Hazards : Unlikely to cause harmful effects under normal
conditions of handling and use

3. Composition/information on ingredients

Chemical identity	:	Sodium Chloride 99.9% minimum on dry basis. Composition by weight is 39.4% sodium and 60.6% chlorine. It is treated with part per million levels of a non-toxic anti-caking additive, Sodium hexacyanoferrate(II) - E535.
Common name	:	Salt
Synonyms	:	Halite
CAS number	:	7647-14-5
EC number	:	231-598-3
3.1	Hazardous Ingredient(s):	Contains no Hazardous Ingredients in accordance with EC Regulation 1907/2006
4.	First aid measures:	
	Inhalation	Remove patient from exposure.
	Skin Contact	Wash skin with water.
	Eye Contact	Irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. If symptoms develop, obtain medical attention.
	Ingestion	Wash out mouth with water and give 200-300 ml (half a pint) of water to drink. Obtain medical attention if ill effects occur.
	Further medical treatment	Symptomatic treatment and supportive therapy as indicated.
5.	Fire-fighting measures	
	Extinguishing media	Non-flammable. As appropriate for the surrounding materials/equipment
	Hazardous decomposition product(s)	Salt withstands temperatures up to its melting point and beyond without decomposing, but at very high temperatures (greater than approximately 800°C) a vapour may be emitted which is particularly irritating to the eyes.
	Fire-fighting Protective Equipment	No special requirements.
6.	Accidental release measures	
	Personal precautions:	Avoid prolonged contact with the skin and inhalation of dust concentrations, otherwise normal good handling and housekeeping practice is adequate. No special protective clothing is required. An eyewash bottle with clean water should be available.
	Environmental precautions:	Clear up spillages. Transfer to a container for disposal. Wash the spillage area with water. Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environment Agency or other appropriate regulatory body.

7. Handling and storage

- 7.1 Precautions for safe handling:** Avoid prolonged skin contact. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Keep away from strong acids and common metals. Salt dust is non-flammable but static electricity can be generated by pneumatic conveying, therefore pipes should be bonded and earthed, especially in environments where a spark could prove hazardous.
- 7.2 Storage:** Due to its hygroscopic nature, dried vacuum salt should be stored in a dry atmosphere and away from concentrated acids. Absorbs moisture if the relative humidity is greater than 75%.

8. Exposure controls/personal protection

8.1 Control parameters

Regulatory Basis	:	UK EH40 Workplace Exposure Limits (WELs)
Regulatory List	:	EH40 WEL
Long Term Exposure Limit	:	8 hr Time Weighted Average (TWA)
Total Inhalable Dust	:	10mg/m ³
Respirable Dust	:	4mg/m ³

- 8.2 Engineering controls:** Static electricity can be generated by pneumatic conveying; therefore pipes should be bonded and earthed, especially in environments where a spark could prove hazardous.

8.3 Personal protection:

Respiratory protection: If the process is such that salt dust is generated, a disposable face mask should be worn.

Hand protection: Gloves to be worn if prolonged contact is anticipated. Dry salt and concentrated solutions can cause withdrawal of fluid from the skin.

Eye protection: Wear chemical safety goggles in situations where contact with the eyes may occur.

Skin protection: Skin should be washed to remove salt. Dry salt and concentrated solutions can cause withdrawal of fluid from the skin.

Other protective measures An eyewash and hand washing facilities should be readily available.

9. Physical and chemical properties.

Form	:	Crystalline solid
Colour	:	White / Colourless

Odour	:	Odourless
pH	:	10.0 approx. (10% solution)
Boiling Point	:	1413°C
Melting Point	:	802°C
Flash Point	:	Non-flammable
Flammability	:	Non-flammable
Explosive Properties	:	Non-flammable
Oxidising Properties	:	Non-flammable
Vapour Pressure	:	2.4mm Hg at 747°C
Density	:	Up to 2.165 g cm ⁻³ at 20°C
Solubility (Water)	:	35.9 g/100g at 0°C ; 39.2 g/100g at 100°C)
Viscosity	:	Not applicable
Vapour Density	:	Not applicable

10. Stability and Reactivity

Chemical Stability	:	Stable
(a) Conditions to avoid:		Reacts with strong sulphuric acid or nitric acid to give hydrogen chloride gas.
(b) Material to avoid:		Under wet conditions can corrode many common metals, particularly iron, aluminium and zinc. Stainless steel and Monel resist attack. Does not react with alkalis at ordinary temperatures.
(c) Thermal decomposition products:		Trace amounts of hydrogen chloride gas may be evolved at temperatures in excess of 800°C. Contains no water of crystallisation.
(d) Flammability		Not flammable
(e) Ignition sensitivity		Not applicable
(f) Explosive severity		Not explosive. Static electricity can be generated by pneumatic conveying; therefore pipes should be bonded and earthed, especially in environments where a spark could prove hazardous.

11. Toxicological Information

Inhalation:	High concentrations of dust may be irritant to the respiratory tract.
Ingestion:	May cause vomiting and diarrhoea. The swallowing of small amounts is unlikely to have any adverse effects. Salt is an essential constituent of the diet. It provides important body electrolytes and is the source of hydrochloric acid present in the gastric juices. The blood stream contains nearly 1% sodium chloride. In normal industrial use salt is Non-hazardous. LD50 3000mg/kg oral, rat.
Skin:	Repeated or prolonged contact may result in dryness leading to mild irritation.

Eyes: Dust may cause irritation.

Carcinogenicity: Not considered to be a carcinogen.

Mutagenicity: Not considered to be a mutagen.

Reproductive Effects: None identified.

Long Term Exposure: Repeated ingestion of excessive amounts may cause disturbance of body electrolyte and fluid balance.

12. Ecological Information

12.1 Toxicity

A maximum value of 412 mg/l ensures the protection of all aquatic life.

Source: Water Research Centre - September 1990

96 hourLC 50 (Fish)	6750 mg/l
48 hourEC 50 (Daphnia)	2024 mg/l
72 hourIC 50 (Algae)	3014 mg/l
Daphnia Subacute	1062 mg/l
Fish Subacute	433 mg/l
BOD 5 Day	0 mg/l
COD	0 mg/l
Earthworm Toxicity	1000 hg/cm ²

12.2 Persistence and degradation

No data available.

12.3 Bioaccumulative potential

No potential for bioaccumulation.

12.4 Mobility in soil

Predicted to have high mobility in soil due to its high solubility in water.

13. Disposal Considerations

Disposal should be in accordance with local, state or national legislation.

14. Transport Information

Not Classified as Dangerous for Transport.

U.N. Number : Not listed

15. Regulatory Information

Not Classified as Dangerous for Supply/Use.

EEC Classification:

Under the Classification, Packaging and Labelling of Dangerous Substances Regulations, 1984,

this material is not dangerous for supply or conveyance.

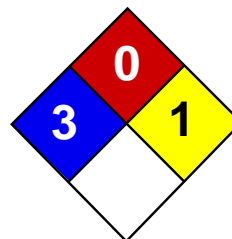
16. Other Information (none)

This safety data sheet was prepared in accordance with EC Regulation 1907/2006.

Information in this publication is believed to be accurate and is given in good faith, but it is for the Customer to satisfy itself of the suitability for its own particular purpose.

The following sections contain revisions or new statements: 1, 3, 6, 9, 12 and 16

Last reviewed February 2011



Health	3
Fire	0
Reactivity	1
Personal Protection	

Material Safety Data Sheet

Sodium Hydroxide, 50% MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium Hydroxide, 50%

Catalog Codes: SLS3127, SLS4549

CAS#: Mixture.

RTECS: Not applicable.

TSCA: TSCA 8(b) inventory: Sodium hydroxide; Water

CI#: Not applicable.

Synonym: Sodium Hydroxide, 50% Solution

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:

1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium hydroxide	1310-73-2	50
Water	7732-18-5	50

Toxicological Data on Ingredients: Sodium hydroxide LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation

leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention immediately. Finish by rinsing thoroughly with running water to avoid a possible infection.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards:

Sodium hydroxide reacts to form explosive products with ammonia + silver nitrate. Benzene extract of allyl benzenesulfonate prepared from allyl alcohol, and benzene sulfonyl chloride in presence of aqueous sodium hydroxide, under vacuum distillation, residue darkened and exploded. Sodium Hydroxide + impure tetrahydrofuran, which can contain peroxides, can cause serious explosions. Dry mixtures of sodium hydroxide and sodium tetrahydroborate liberate hydrogen explosively at 230-270 deg. C. Sodium Hydroxide reacts with sodium salt of trichlorophenol + methyl alcohol + trichlorobenzene + heat to cause an explosion. (Sodium hydroxide)

Section 6: Accidental Release Measures

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.

Large Spill:

Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, metals, acids, alkalis, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

Sodium hydroxide STEL: 2 (mg/m³) from ACGIH (TLV) [United States] TWA: 2 CEIL: 2 (mg/m³) from OSHA (PEL) [United States] CEIL: 2 (mg/m³) from NIOSH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Odorless.

Taste: Alkaline. Bitter. (Strong.)

Molecular Weight: Not applicable.

Color: Clear Colorless.

pH (1% soln/water): Basic.

Boiling Point: 140°C (284°F)

Melting Point: 12°C (53.6°F)

Critical Temperature: Not available.

Specific Gravity: 1.53 (Water = 1)

Vapor Pressure: The highest known value is 2.3 kPa (@ 20°C) (Water).

Vapor Density: The highest known value is 0.62 (Air = 1) (Water).

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Easily soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials, water/moisture

Incompatibility with various substances:

Reactive with oxidizing agents, reducing agents, metals, acids, alkalis. Slightly reactive with water

Corrosivity:

Extremely corrosive in presence of aluminum, brass. Corrosive in presence of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Hygroscopic. Much heat is evolved when solid material is dissolved in water. Therefore cold water and caution must be used for this process. Generates considerable heat when a sodium hydroxide solution is mixed with an acid Sodium hydroxide solution and octanol + diborane during a work-up of a reaction mixture of oxime and diborane in tetrahydrofuran is very exothermic, a mild explosion being noted on one occasion. Reactive with water, acids (mineral, non-oxidizing, e.g. hydrochloric, hydrofluoric acid, muriatic acid, phosphoric), acids (mineral, oxidizing e.g. chromic acid, hypochlorous acid, nitric acid, sulfuric acid), acids (organic e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid), aldehydes (e.g. acetaldehyde, acrolein, chloral hydrate, formaldehyde), carbamates (e.g. carbanolate, carbofuran), esters (e.g. butyl acetate, ethyl acetate, propyl formate), halogenated organics (dibromoethane, hexachlorobenzene, methyl chloride, trichloroethylene), isocyanates (e.g. methyl isocyanate), ketones (acetone, acetophenone, MEK, MIBK), acid chlorides, strong bases, strong oxidizing agents, strong reducing agents, flammable liquids, powdered metals and metals (i.e aluminum, tin, zinc, hafnium, raney nickel), metals (alkali and alkaline e.g. cesium, potassium, sodium), metal compounds (toxic e.g. beryllium, lead acetate, nickel carbonyl, tetraethyl lead), nitrides (e.g. potassium nitride, sodium nitride), nitriles (e.g. acetonitrile, methyl cyanide), nitro compounds (organic e.g. nitrobenzene, nitromethane), acetic anhydride, hydroquinone, chlorohydrin, chlorosulfonic acid, ethylene cyanohydrin, glyoxal, hydrosulfuric acid, oleum, propiolactone, acylonitrile, phorous pentoxide, chloroethanol, chloroform-methanol, tetrahydroborate, cyanogen azide, 1,2,4,5 tetrachlorobenzene, cinnamaldehyde. Reacts with formaldehyde hydroxide to yield formic acid, and hydrogen. (Sodium hydroxide)

Special Remarks on Corrosivity: Very caustic to aluminum and other metals in presence of moisture.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:

LD50: Not available. LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:

Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Investigation as a mutagen (cytogenetic analysis), but no data available. (Sodium hydroxide)

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: May be harmful if absorbed through skin. Causes severe skin irritation and burns. May cause deep penetrating ulcers of the skin. Eyes: Causes severe eye irritation and burns. May cause chemical conjunctivitis and corneal damage. Inhalation: Harmful if inhaled. Causes severe irritation of the respiratory tract and mucous membranes with coughing, burns, breathing difficulty, and possible coma. Irritation may lead the chemical pneumonitis and pulmonary edema. Causes chemical burns to the respiratory tract and mucous membranes. Ingestion: May be fatal if swallowed. May cause severe and permanent damage to the digestive tract. Causes

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Sodium hydroxide, solution (Sodium hydroxide) UNNA: UN1824 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information**Federal and State Regulations:**

Illinois toxic substances disclosure to employee act: Sodium hydroxide Illinois chemical safety act: Sodium hydroxide New York release reporting list: Sodium hydroxide Rhode Island RTK hazardous substances: Sodium hydroxide Pennsylvania RTK: Sodium hydroxide Minnesota: Sodium hydroxide Massachusetts RTK: Sodium hydroxide New Jersey: Sodium hydroxide Louisiana spill reporting: Sodium hydroxide TSCA 8(b) inventory: Sodium hydroxide; Water CERCLA: Hazardous substances.: Sodium hydroxide: 1000 lbs. (453.6 kg);

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):

CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 06:32 PM

Last Updated: 11/01/2010 12:00 PM

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SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Vithane

Version 3.0

Revision Date
28.11.2008

Print Date
24.03.2009

GB / EN

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product information

Commercial Product Name : Vithane
Synonyms : Micro-nutriënt solution, containing trace elements.
Use : Dosing solution for anaerobic waste water treatment
Company : BIOTHANE SYSTEMS INTERNATIONAL
P.O. Box 5068
2600 GD Delft
The Netherlands
Telephone : +31 (0) 15 - 2700111
Telefax : +31 (0) 15 - 2560927
E-mail : bsi@veoliawater.com
Emergency telephone : +31 (0) 15 - 2700111

2. HAZARDS IDENTIFICATION

Risk advice to man and the environment



Symbol(s) : T Toxic
N Dangerous for the environment

R-phrase(s) : R49 May cause cancer by inhalation.
R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R61 May cause harm to the unborn child.
R68 Possible risk of irreversible effects.
R42/43 May cause sensitization by inhalation and skin contact.
R36/38 Irritating to eyes and skin.
R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature

Aqueous solution

Hazardous components

Chemical Name	CAS-No.	EC-No. / Registration number	Classification	Concentration[%]
Sulfuric acid aluminum salt (3:2), octadecahydrate	7784-31-8	233-135-0	Xn; R22 Xi; R36/37/38	< 12,5
zinc chloride	7646-85-7	231-592-0	Xn; R22 C; R34 N; R50 - R53	< 5
Manganese(II) sulphate, monohydrate	10034-96-5	232-089-9	Xn; R48/20/22 N; R51/53	< 3

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Vithane

Version 3.0

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28.11.2008

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24.03.2009

GB / EN

copper sulfate pentahydrate	7758-99-8	231-847-6	Xn; R22 Xi; R36/38 N; R50/53	< 5
Nickel(II) sulfate hexahydrate (1:1:6)	10101-97-0	232-104-9	R49; Carc.Cat.1 R68; Mut.Cat.3 R61; Repr.Cat.2 T; R48/23 Xn; R20/22 Xi; R38 R42/43 N; R50/53	< 3
Sulfuric acid,cobalt(2+)salt(1:1),heptahydrate	10026-24-1	233-334-2	R49; Carc.Cat.2 R60; Repr.Cat.2 R68; Mut.Cat.3 Xn; R22 N; R50/53 R42/43	< 1

4. FIRST AID MEASURES

- General advice : Remove from exposure, lie down. In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). When symptoms persist or in all cases of doubt seek medical advice. Never give anything by mouth to an unconscious person. Take off all contaminated clothing immediately.
- Inhalation : Remove to fresh air. Keep patient warm and at rest. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.
- Skin contact : Wash off immediately with soap and plenty of water. Obtain medical attention.
- Eye contact : Remove contact lenses. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- Ingestion : If swallowed, seek medical advice immediately and show this container or label. If a person vomits when lying on his back, place him in the recovery position. Do NOT induce vomiting.

5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- Extinguishing media which shall not be used for safety reasons : High volume water jet
- Specific hazards during fire fighting : Do not use a solid water stream as it may scatter and spread fire.
- Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.

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Further information : Standard procedure for chemical fires.
Exposure to decomposition products may be a hazard to health.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Use water spray to cool unopened containers.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Refer to protective measures listed in sections 7 and 8.
Immediately evacuate personnel to safe areas.
Ventilate the area.
Avoid inhalation of vapour or mist.
Avoid contact with skin, eyes and clothing.

Environmental precautions : Should not be released into the environment.
Avoid subsoil penetration.
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods for cleaning up : Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

7. HANDLING AND STORAGE

Handling

Advice on safe handling : Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
Do not breathe vapours or spray mist.
For personal protection see section 8.

Advice on protection against fire and explosion : Electrical equipment should be protected to the appropriate standard.

Dust explosion class : not applicable

Storage

Requirements for storage areas and containers : Keep containers tightly closed in a dry, cool and well-ventilated place.
Store in original container.

Advice on common storage : Store away from alkali liquors and metals.
Keep away from food, drink and animal feedingstuffs.

Remarks : No decomposition if stored and applied as directed.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Control parameters	Basis	Update
zinc chloride	7646-85-7	STEL: 2 mg/m3, TWA: 1 mg/m3,	UK EH40	1997-01-01
Manganese(II) sulphate, monohydrate	10034-96-5	TWA: 0,5 mg/m3,	UK EH40	2003-05-01
Nickel(II) sulfate hexahydrate (1:1:6)	10101-97-0	TWA: 0,1 mg/m3, Sk: Can be absorbed through skin Capable of causing cancer and/or heritable genetic damage. The identified substances include those which:- are assigned the risk phrases 'R45: May cause cancer'; 'R46: may cause heritable genetic damage'; 'R49: May cause cancer by inhalation' or - a substance or process listed in Schedule 1 of COSHH. Capable of causing occupational asthma. The identified substances are those which:- are assigned the risk phrase 'R42: May cause sensitisation by inhalation'; or 'R42/43: May cause sensitisation by inhalation and skin contact' or- are listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma' as updated from time to time, or any other substance which the risk assessment has shown to be a potential cause of occupational asthma.	UK EH40	2001-04-01
Sulfuric acid,cobalt(2+)-salt(1:1),heptahydrate	10026-24-1	TWA: 0,1 mg/m3, Capable of causing cancer and/or heritable genetic damage. The identified substances include those which:- are assigned the risk phrases 'R45: May cause cancer'; 'R46: may cause heritable genetic damage'; 'R49: May cause cancer by inhalation' or - a substance or process listed in Schedule 1 of COSHH. Capable of causing occupational asthma. The identified substances are those which:- are assigned the risk phrase 'R42: May cause sensitisation by inhalation'; or 'R42/43: May cause sensitisation by inhalation and skin contact' or- are listed in section C of HSE publication 'Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma' as updated from time to time, or any other substance which the risk assessment has shown to be a potential cause of occupational asthma.	UK EH40	1997-01-01

Engineering measures

General advice

: Provide sufficient air exchange and/or exhaust in work rooms.

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Personal protective equipment

Respiratory protection : In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit.
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection
butyl-rubber
Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work.
For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer.

Eye protection : Please wear suitable protective goggles. Also wear face protection if there is a splash hazard.

Skin and body protection : impervious clothing

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
General industrial hygiene practice.
When using do not eat, drink or smoke.
Avoid contact with skin, eyes and clothing.
Wash hands before breaks and at the end of workday.
Wash contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form : liquid

Odour : odourless

Safety data

pH : 1 - 2

Explosive properties : Explosive properties according to the EU: not applicable

Boiling point/boiling range : 101,7 °C

Flash point : not applicable

Vapour pressure : 0,02 hPa
at 20 °C

Density : 1,2 g/cm³

Water solubility : Easy miscible

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10. STABILITY AND REACTIVITY

- Materials to avoid : Metals
Bases
- Hazardous reactions : General Information:
BasesMetals
- Stability:
Stable under recommended storage conditions.

11. TOXICOLOGICAL INFORMATION

- Acute oral toxicity : Harmful if swallowed.
- Acute inhalation toxicity : Irritating to respiratory system.
- Skin irritation : Irritating to skin.
- Eye irritation : The liquid splashed in the eyes may cause irritation and reversible damage.
Strong lachrymation can make it difficult to escape
- Sensitisation : May cause sensitization by inhalation and skin contact.
- Further information : Chronic Health Hazard

Components:

- | | | |
|--|------------|--|
| zinc chloride | 7646-85-7 | <u>Acute oral toxicity</u> : LD50 rat
Dose: 350 mg/kg |
| | | <u>Acute inhalation toxicity</u> : LC50 rat
Dose: 1.960 g/m3
Exposure time: 10 min |
| | | <u>Skin irritation</u> : Classification: Causes burns.
Result: Extremely corrosive and destructive to tissue. |
| | | <u>Eye irritation</u> : Classification: Causes burns.
Result: Risk of serious damage to eyes. |
| copper sulfate pentahydrate | 7758-99-8 | <u>Acute oral toxicity</u> : LD50 rat
Dose: 300 mg/kg |
| | | <u>Acute dermal toxicity</u> : LD50 rat
Dose: > 2.000 mg/kg |
| | | <u>Skin irritation</u> : Classification: Irritating to skin.
Result: Skin irritation |
| | | <u>Eye irritation</u> : Classification: Irritating to eyes.
Result: Eye irritation |
| Sulfuric acid,cobalt(2+)salt(1:1),
Heptahydrate | 10026-24-1 | <u>Acute oral toxicity</u> : LD50 rat
Dose: 768 mg/kg |

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12. ECOLOGICAL INFORMATION

Further information on ecology

Adsorbed organic bound halogens (AOX) : not included

Other ecotoxicological advice : The product should not be allowed to enter drains, water courses or the soil.

Components:

zinc chloride

7646-85-7

Toxicity to fish:

LC50

Species: Brachydanio rerio (zebra fish)

Dose: 38 mg/l

Exposure time: 96 h

Acute and prolonged toxicity for aquatic invertebrates:

EC50

Species: Daphnia magna (Water flea)

Dose: 0,33 mg/l

Exposure time: 48 h

copper sulfate pentahydrate

7758-99-8

Toxicity to fish:

LC50

Species:

Dose: 0,1 - 2,5 mg/l

Exposure time: 96 h

Acute and prolonged toxicity for aquatic invertebrates:

EC50

Species: Daphnia magna (Water flea)

Dose: 0,024 mg/l

Exposure time: 48 h

13. DISPOSAL CONSIDERATIONS

Advice on disposal and packaging : Disposal:
In accordance with local and national regulations.

Disposal of uncleaned packaging : Waste key (uncleaned packaging):
150110, packaging containing residues of or contaminated by dangerous substances

14. TRANSPORT INFORMATION

Land transport

ADR

UN Number : 3082

Description of the goods : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(copper sulfate pentahydrate, zinc chloride)

Class : 9

Packaging group : III

Classification Code : M6

Hazard identification No : 90

ADR/RID-Labels : 9

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RID

UN Number : 3082
Description of the goods : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(copper sulfate pentahydrate, zinc chloride)
Class : 9
Packaging group : III
Classification Code : M6
Hazard identification No : 90
ADR/RID-Labels : 9

Air transport

IATA

UN Number : 3082
Proper technical name : Environmentally hazardous substance, liquid, n.o.s.
(copper sulfate pentahydrate)
Class : 9
Packaging group : III
ICAO-Labels : 9
Packing instruction (cargo aircraft) : 914
Packing instruction (passenger aircraft) : 914
Packing instruction (passenger aircraft) : Y914

Sea transport

IMDG

Substance No. : UN 3082
Proper technical name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(copper sulfate pentahydrate, zinc chloride)
Class : 9
Packaging group : III
IMDG-Labels : 9
EmS Number : F-A S-F
Marine pollutant : yes

15. REGULATORY INFORMATION

Labelling according to EC Directives

Hazardous components which must be listed on the label:

- 10101-97-0 Nickel(II) sulfate hexahydrate (1:1:6)
- 10026-24-1 Sulfuric acid,cobalt(2+)-salt(1:1),heptahydrate

Symbol(s) : T Toxic
N Dangerous for the environment



R-phrase(s) : R49 May cause cancer by inhalation.
R61 May cause harm to the unborn child.
R48/23 Also toxic: danger of serious damage to health
by prolonged exposure through inhalation.
R36/38 Irritating to eyes and skin.
R68 Possible risk of irreversible effects.
R42/43 May cause sensitization by inhalation and skin

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	R50/53	contact. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
<u>S-phrases(s)</u>	: S53	Avoid exposure - obtain special instructions before use.
	S23	Do not breathe vapour.
	S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
	S35	This material and its container must be disposed of in a safe way.
	S36/37	Wear suitable protective clothing and gloves.
	S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
	S57	Use appropriate container to avoid environmental contamination.
<u>Special labelling of certain preparations</u>	: Restricted to professional users.	
<u>VOC:</u>	: no VOC duties	
<u>Seveso Directive (96/82/EC)</u>	: Update: 2003	Quantity 1
	Toxic	50 t
		Quantity 2
		200 t
<u>National legislation</u>		
<u>Other regulations</u>	: Take note of Dir 94/33/EC on the protection of young people at work.	
<u>Other regulations</u>	: Take note of Dir 92/85/EEC on the safety and health at work of pregnant workers.	

16. OTHER INFORMATION

Full text of R-phrases referred to under sections 2 and 3

R20/22	Also harmful by inhalation and if swallowed.
R22	Harmful if swallowed.
R34	Causes burns.
R36/37/38	Irritating to eyes, respiratory system and skin.
R36/38	Irritating to eyes and skin.
R38	Irritating to skin.
R42/43	May cause sensitization by inhalation and skin contact.
R48/20/22	Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R48/23	Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R49	May cause cancer by inhalation.
R50	Very toxic to aquatic organisms.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R53	May cause long-term adverse effects in the aquatic environment.

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R60	May impair fertility.
R61	May cause harm to the unborn child.
R68	Possible risk of irreversible effects.

Further information

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