

CONTAMINATION ASSESSMENT

**Deans Yard, Orchard Way,
Fonthill, Sussex**

April 2017

Client:

M J H Property Development Ltd
M J H House
Unit S4, Rudford Estate
Ford Road
Arundel
West Sussex
BN18 0BF

Geotechnical Engineer:

W K Elson
PhD, CEng, MICE
Orchard End
7 Finches Court
Hickmans Lane
Lindfield, Sussex
RH16 2PG

Contamination Assessment
Deans Yard, Orchard Way,
Fontwell, Sussex

1. Introduction

Deans Yards is a small area of land off Orchard Way, Fontwell, BN18 0SB. The site was occupied by a line of lock-up garages with an open area paved with concrete on the west side of the site. The garages were once occupied by a number of small businesses, including a car hire firm, however, the units were old and proved difficult to let without extensive refurbishment. Planning permission has been granted to build two detached chalet bungalows on the site and Drawing No. 2013/PO3 by LM Associates refers. A condition of planning permission was that an assessment of the risk of contamination of the site be identified. To this end a site visit was undertaken on 15th March 2017 and samples of soil were recovered and assayed for a range of common contaminants.

2. General

At the date of the site visit the garages and all the concrete slabs had been removed from the site. An open trial pit that had been used for an infiltration test was present and the general soil profile below the site could be seen. The site was completely cleared, although a thin layer of concrete debris and brick hardcore, on which the original concrete slabs were laid, was present. There were also areas where fragments of asbestos cement material were lying on the surface. It is understood the garage roofs were of asbestos cement and the fragments arose from demolition of the garages. There was no other visible contamination on the site.

3. Geology and Hydro-geology

The 1/50,000 geological map, Sheet 317, indicates the area to be underlain by a Head of clay gravel, or Coombe Deposit. These soils typically comprise a coarse angular gravel of flint with a matrix of clay or clay and chalk putty. The underlying solid geology was shown to be the Lambeth Group; a mottled grey

and dull red clay in this area of Sussex. Boreholes at Fontwell Racecourse showed the head deposits to be 6 to 9m in thickness (British Geological Survey records) with a ground water table at a depth of 7m.

The site lies within the sub-surface water protection zone for a public water supply borehole on Fontwell Race Course. The borehole extracts water from the underlying chalk aquifer and thus lies beneath the clays of the Lambeth Group. Thus rainfall or leakage of water on the site will be confined to a perched water table in the gravelly Head.

There are no surface water features in the area and the gravels are relatively permeable. There will be a concealed spring line at the interface of the Lambeth Clays with the Upper Chalk to the north of the site. Ground water flow is within the gravelly Head and over the underlying clays. Springs emerge south of the site towards Eastergate and give rise to a number of small streams.

The Health Protection Agency map for the south east indicates the site to be in an area where emissions of radon are a risk and the basic protection against this gas entering the houses should be incorporated in the design.

There are a number of landfill sites in former gravel pits in the area, however, none are within 250m and there should be no risk from the migration of landfill gas.

4. Intrusive Investigation

Samples of soil from below the thin fill on the surface were recovered and assayed for a range of common contaminants, including metals, poly-aromatic hydrocarbons and asbestos. There were no odours or soil staining typical of petroleum hydrocarbon or solvents on the site, however, two samples from the original parking area were assayed for fuel oils. A description of the soils encountered in the shallow trial pits is given in Appendix B and the results of the chemical assays in Appendix C.

The concentrations of the various contaminants has been compared with published site screening values (Table 1) for residential occupation with plant uptake; a Tier 1 assessment.

4.1. Metals

The concentrations of all the heavy metals were below the corresponding site screening value. The concentration of most of the metals was typical of agricultural soils (ICRCL Paper 42/80) and all the samples were alkaline in reaction.

4.2. Poly-aromatic Hydrocarbons

The total concentration of poly-aromatic hydrocarbons in the soil samples was low. In particular the concentrations of benzo- α -pyrene, a carcinogenic compound was below the site screening value of 2.5 mg/kg.

4.3. Petroleum Hydrocarbons

As noted above there was no visual evidence of oil contamination on the site, however, the two samples assayed indicated some contamination with oils in the lubricating oil range. Concentrations of oils in the carbon range 21 to 40 were much less than screening values published by Land Quality Management/Chartered Institute of Environmental Health (2015).

4.4. Asbestos

Three samples from the proposed garden areas of the bungalows were screened for asbestos. In two samples no asbestos was found and in one sample chrysotile fibres were noted. There were also visible fragments of asbestos cement on the surface of the site in some areas.

5. Risk Assessment

A conceptual model of pollution linkages for the site has been assessed using the source-pathway-receptor model given in Contaminated Land Report CLR 11 (Table 2).

Source: very little contamination was identified in the topsoil underlying the site. However, the presence of fragments of asbestos cement material on the surface was of concern.

Pathways: There will be small gardens to the rear of the bungalows and common pathways of ingestion of soil and dust will be present. The gravelly Head is permeable and soluble or liquid contaminants would percolate into the water table.

Receptors: The major receptors will be residents of the bungalows and the underlying water table.

The garages and small buildings have been cleared from the site as have all the concrete slabs, leaving a thin fill or disturbed layer of crushed concrete, brick gravel and soil. It is noted the original concrete slabs would have greatly reduced the risk of contamination of the underlying soils. The site is surrounded by residential properties and the risk of migration from off-site was assessed to be negligible.

A significant risk to human health from fragments of asbestos cement material was found on the site and some remediation will be required. In addition, the area is at risk of emissions of radon and an appropriate gas membrane will be required.

6. Conclusions and Recommendations

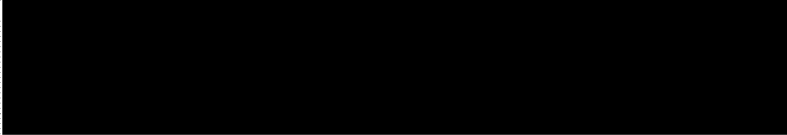
At the date of this intrusive investigation the site had been cleared of all the garages and the concrete slabs and 200 to 300mm of material had been removed. The cleared site was underlain by approximately 300mm of disturbed soil and fill, the original topsoil and a dense Head of angular flint gravel and silty clay. There were no areas of visible staining, however, asbestos cement fragments from the demolition of the garage had been spread on some areas of the site.

To remediate the site it is recommended that:

- surface debris in the areas of the gardens be excavated to a depth of 300mm below the current site level
- the gardens to be restored with 300mm certified clean topsoil.
- areas of permanent paving, driveways and parking areas may be constructed without further remediation as the construction will seal possible pathways.
- the bungalows to be provided with a ventilated underfloor void and a radon resistant damp-proof membrane fully sealed around all service entries.

The above actions will remove the asbestos cement fragments on the surface and any asbestos mixed in to the surface where access to residents is possible and the gardens will be covered with a blanket of clean material.

During the remediation work a visual check should be made for other possible areas of localised contamination. Any such areas should be investigated and appropriate remediation action taken.



(W K Elson)
PhD, CEng, MICE

12 April 2017

TABLE 1**Site Screening Values for Soils****Metals**

Determinand	Screening Value	Reference
Arsenic	32 mg/kg	EA for residential use (2009) ¹
Boron (water soluble)	3 mg/kg 291 mg/kg	MAFF (1998) ⁴ LQM/CIEH ²
Cadmium	10 mg/kg	EA for residential use (2009) ¹
Chromium	130 mg/kg	CLEA for residential use ³
Copper	130 mg/kg 2330 mg/kg	MAFF (1998) ⁴ LQM/CIEH ²
Lead	200 mg/kg	DEFRA SP1010 (2014) ⁷
Mercury (element)	8 mg/kg	EA for residential use (2009) ¹
Nickel	130 mg/kg	EA for residential use (2009) ¹
Selenium	350 mg/kg	EA for residential use (2009) ¹
Zinc	300 mg/kg 3750 mg/kg	MAFF (1998) ⁴ LQM/CIEH ²

¹ Science Report SC050021, January 2009 published by the Environment Agency.
For residential occupation.

² Generic Assessment Criteria for Human Health Assessment by Land Quality Management
and Chartered Institute of Environmental Health, 2nd edition 2009.
For residential occupation.

³ Soil guideline values previously published by DEFRA. Sgv's for lead and chromium have
Not been revised by the Environment Agency to date.

⁴ The Soil Code MAFF 1998. Phyto-toxic criteria for plant growth.

cont.....

Site Screening Values for Soils

Organic Compounds

Determinand	Screening Value	Reference
Total PAH	50 mg/kg	WRAS Paper 9-04-03 ⁶
Benzo- α -pyrene	2.5 mg/kg	DEFRA SP1010 (2014) ⁷
Fluorene	2270 mg/kg	LQM/CIEH ⁵
Dibenzo (a,h)	1.3 mg/kg	LQM/CIEH ⁵
Anthracene		
Naphthalene	6.9 mg/kg	LQM/CIEH ⁵

⁵ Generic Assessment Criteria for Human Health Assessment by Land Quality Management and Chartered Institute of Environmental Health, 1st edition.
For residential occupation without plant uptake and 1 percent soil organic matter.

⁶ Selection of Materials for Water Supply Pipes to be Laid in Contaminated Lane,
WRSA Paper 9-04-03, October 2002.

⁷ DEFRA Category 4 Screening Values SP1010 July 2014

TABLE 2
Conceptual Model of Pollution Linkages

Deans Yard, Orchard Way, Fontwell, Sussex.

Pollution Linkage	Metals	Poly-aromatic Hydrocarbons	Asbestos	Petroleum Hydrocarbons
Human Health				
• Ingestion of soil/dust	X	L	M	L
• Ingestion of contaminated food	X	L	X	L
• Dermal contact	X	L	X	L
• Inhalation of VOC's	X	X	X	L
• Risk of explosion or asphyxiation	X	X	X	X
Water Environment				
• Uncontained surface run-off	X	X	X	X
• Migration of mobile constituents into ground/surface water	L	X	X	L
Flora and Fauna				
• Potential impact on landscape or plants	L	X	X	X
• Potential impact on water plants and fauna	X	X	X	X
Building Materials				
• Direct contact with foundations	X	X	X	X
• Permeation through water pipes	X	L	X	L

Assessed degree of risk : H - high, M - moderate, L - low, X - no risk

APPENDIX A

Deans Yard, Orchard Way
Fontwell, Sussex

Site Plan etc

Project

Proposed Residential Development
Peans Yard
Orchard Way, Fortwell
West Sussex
BN15 0SB



Architects & Planning Consultants

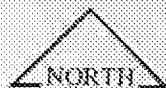
Clock Tower House, Lewes Road
Lindfield, West Sussex, RH16 2LH
Telephone 01444 - 484711

Client

M.H Properties Ltd

Drawing

Site Location Plan



Drawing no.

3113.SPO1

date

Apr 13

scale

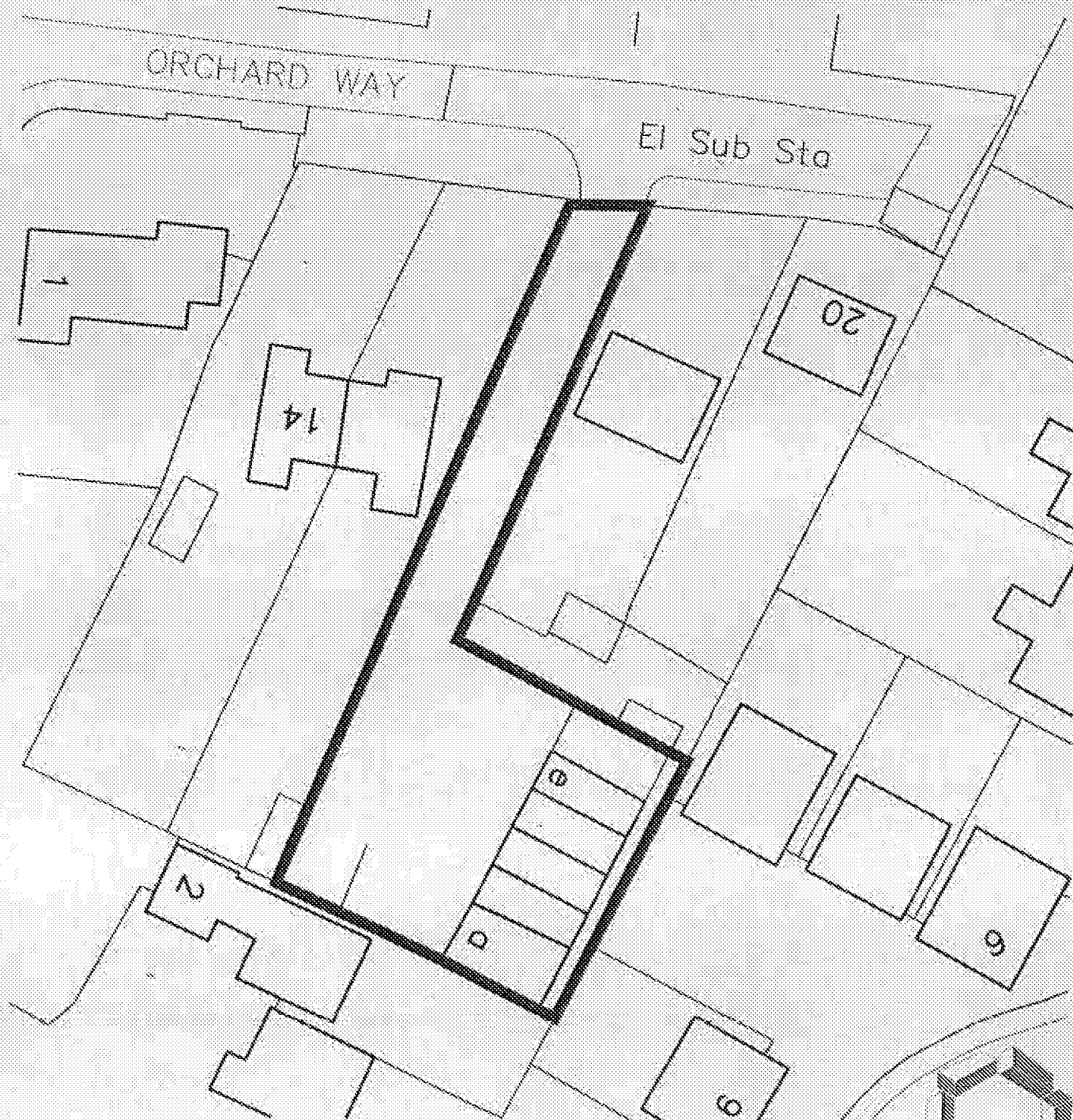
1:1250

drawn

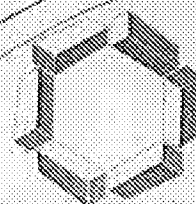
ACM

revisions

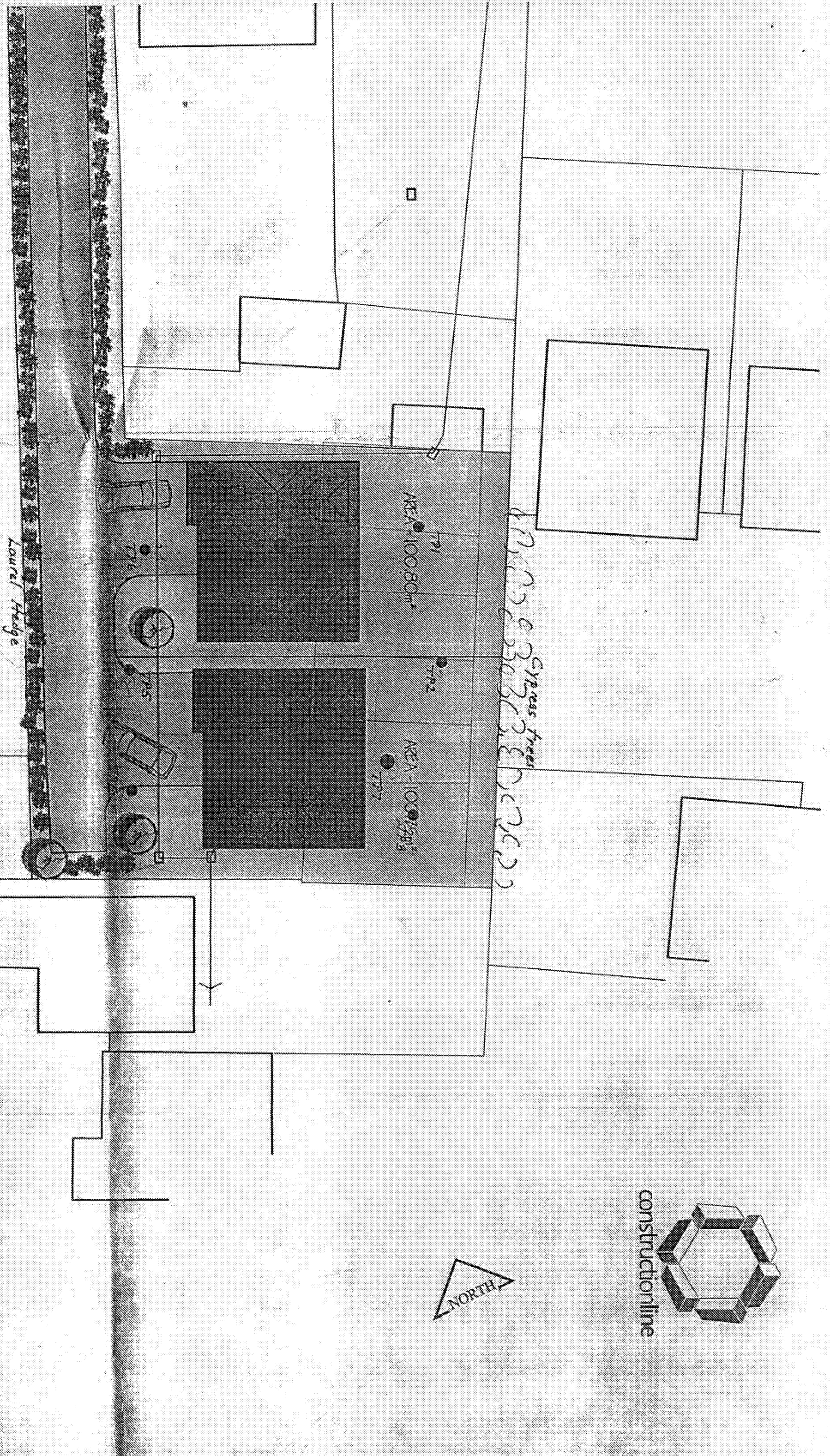
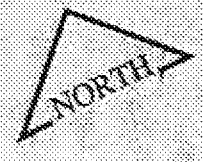
A



© THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE.
NO DIMENSIONS TO BE SCALED FROM DRAWINGS.
IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE COMPLIANCE WITH BUILDING REGULATIONS.



constructionline



Rev A: June 2015 / Update Refusance/ RCM
Project

Proposed Residential Development
Deans Yard
Orchard Way, Farnwell
West Sussex
BN18 0SB

Google Maps



Imagery ©2017 Google, Map data ©2017 Google 20 m

Chlorine gas for the 1918-1919 season.

Ergebnisse:

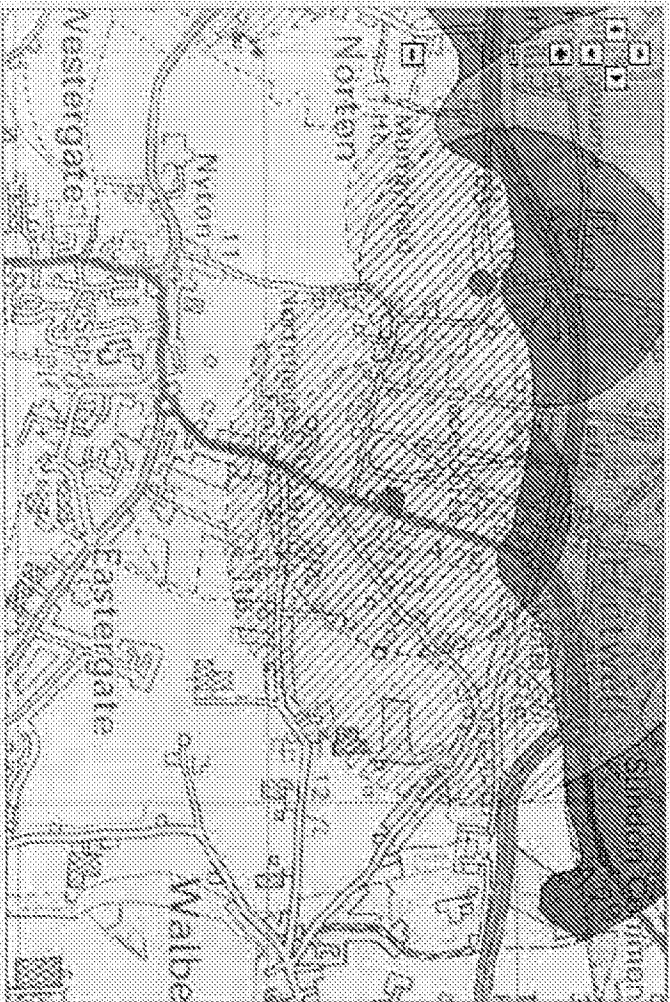
12/15/2006

Shareholders

4. 8524, 8538, 4. 4336, 2573, 26. 9/10/06, 4. 7833, 53/62

Examine receipt *Callin 86-9555* *I will reply 400-6555*

☒ Disruptive change prediction zones ☐ Lower zone - subscription activity only ☐ Lower zone - Other zone ☐ Other zone - subscription activity only ☐ Lower zone ☐ Total subscription ☐ Total subscription - subscription activity only ☐ Special interest ☐ ESG Analysis Maps - Superfund Disruption ☐ Principal ☐ Secondary A ☐ Secondary B ☐ Secondary C ☐ Secondary D ☐ Secondary E ☐ Secondary F ☐ Secondary G ☐ Secondary H ☐ Secondary I ☐ Secondary J ☐ Secondary K ☐ Secondary L ☐ Secondary M ☐ Secondary N ☐ Secondary O ☐ Secondary P ☐ Secondary Q ☐ Secondary R ☐ Secondary S ☐ Secondary T ☐ Secondary U ☐ Secondary V ☐ Secondary W ☐ Secondary X ☐ Secondary Y ☐ Secondary Z ☐ Secondary AA ☐ Secondary AB ☐ Secondary AC ☐ Secondary AD ☐ Secondary AE ☐ Secondary AF ☐ Secondary AG ☐ Secondary AH ☐ Secondary AI ☐ Secondary AJ ☐ Secondary AK ☐ Secondary AL ☐ Secondary AM ☐ Secondary AN ☐ Secondary AO ☐ Secondary AP ☐ Secondary AQ ☐ Secondary AR ☐ Secondary AS ☐ Secondary AT ☐ Secondary AU ☐ Secondary AV ☐ Secondary AW ☐ Secondary AX ☐ Secondary AY ☐ Secondary AZ ☐ Secondary BA ☐ Secondary BB ☐ Secondary BC ☐ Secondary BD ☐ Secondary BE ☐ Secondary BF ☐ Secondary BG ☐ Secondary BH ☐ Secondary BI ☐ Secondary BJ ☐ Secondary BK ☐ Secondary BL ☐ Secondary BM ☐ Secondary BN ☐ Secondary BO ☐ Secondary BP ☐ Secondary BQ ☐ Secondary BR ☐ Secondary BS ☐ Secondary BT ☐ Secondary BU ☐ Secondary BV ☐ Secondary BW ☐ Secondary BX ☐ Secondary BY ☐ Secondary BZ ☐ Secondary CA ☐ Secondary CB ☐ Secondary CC ☐ Secondary CD ☐ Secondary CE ☐ Secondary CF ☐ Secondary CG ☐ Secondary CH ☐ Secondary CI ☐ Secondary CJ ☐ Secondary CK ☐ Secondary CL ☐ Secondary CM ☐ Secondary CN ☐ Secondary CO ☐ Secondary CP ☐ Secondary CQ ☐ Secondary CR ☐ Secondary CS ☐ Secondary CT ☐ Secondary CU ☐ Secondary CV ☐ Secondary CW ☐ Secondary CX ☐ Secondary CY ☐ Secondary CZ ☐ Secondary DA ☐ Secondary DB ☐ Secondary DC ☐ Secondary DD ☐ Secondary DE ☐ Secondary DF ☐ Secondary DG ☐ Secondary DH ☐ Secondary DI ☐ Secondary DJ ☐ Secondary DK ☐ Secondary DL ☐ Secondary DM ☐ Secondary DN ☐ Secondary DO ☐ Secondary DP ☐ Secondary DQ ☐ Secondary DR ☐ Secondary DS ☐ Secondary DT ☐ Secondary DU ☐ Secondary DV ☐ Secondary DW ☐ Secondary DX ☐ Secondary DY ☐ Secondary DZ ☐ Secondary EA ☐ Secondary EB ☐ Secondary EC ☐ Secondary ED ☐ Secondary EE ☐ Secondary EF ☐ Secondary EG ☐ Secondary EH ☐ Secondary EI ☐ Secondary EJ ☐ Secondary EK ☐ Secondary EL ☐ Secondary EM ☐ Secondary EN ☐ Secondary EO ☐ Secondary EP ☐ Secondary EQ ☐ Secondary ER ☐ Secondary ES ☐ Secondary ET ☐ Secondary EU ☐ Secondary EV ☐ Secondary EW ☐ Secondary EX ☐ Secondary EY ☐ Secondary EZ ☐ Secondary FA ☐ Secondary FB ☐ Secondary FC ☐ Secondary FD ☐ Secondary FE ☐ Secondary FF ☐ Secondary FG ☐ Secondary FH ☐ Secondary FI ☐ Secondary FJ ☐ Secondary FK ☐ Secondary FL ☐ Secondary FM ☐ Secondary FN ☐ Secondary FO ☐ Secondary FP ☐ Secondary FQ ☐ Secondary FR ☐ Secondary FS ☐ Secondary FT ☐ Secondary FU ☐ Secondary FV ☐ Secondary FW ☐ Secondary FX ☐ Secondary FY ☐ Secondary FZ ☐ Secondary GA ☐ Secondary GB ☐ Secondary GC ☐ Secondary GD ☐ Secondary GE ☐ Secondary GF ☐ Secondary GG ☐ Secondary GH ☐ Secondary GI ☐ Secondary GJ ☐ Secondary GK ☐ Secondary GL ☐ Secondary GM ☐ Secondary GN ☐ Secondary GO ☐ Secondary GP ☐ Secondary GQ ☐ Secondary GR ☐ Secondary GS ☐ Secondary GT ☐ Secondary GU ☐ Secondary GV ☐ Secondary GW ☐ Secondary GX ☐ Secondary GY ☐ Secondary GZ ☐ Secondary HA ☐ Secondary HB ☐ Secondary HC ☐ Secondary HD ☐ Secondary HE ☐ Secondary HF ☐ Secondary HG ☐ Secondary HH ☐ Secondary HI ☐ Secondary HJ ☐ Secondary HK ☐ Secondary HL ☐ Secondary HM ☐ Secondary HN ☐ Secondary HO ☐ Secondary HP ☐ Secondary HQ ☐ Secondary HR ☐ Secondary HS ☐ Secondary HT ☐ Secondary HU ☐ Secondary HV ☐ Secondary HW ☐ Secondary HX ☐ Secondary HY ☐ Secondary HZ ☐ Secondary IA ☐ Secondary IB ☐ Secondary IC ☐ Secondary ID ☐ Secondary IE ☐ Secondary IF ☐ Secondary IG ☐ Secondary IH ☐ Secondary II
--



to the increased hydraulic conductivity and the consequent increase in the hydraulic conductivity of the soil. After the increase in the hydraulic conductivity of the soil, the hydraulic conductivity of the soil is increased by the increase in the hydraulic conductivity of the soil.

[illegible]

Journal of Management Inquiry 20(1)

Environ Biol Fish (2016) 98:17–28

Circumstances present a threat of our drinking water. You agree that your water is safe to drink, gathering bacteria from the air. This does help to monitor the risk of contamination; from any such case you might cause pollution in the area.

The Bureau Protection Zones are not displayed at bearing angles less than 3.0000 (Orthographic Survey: 1.5000 scale) or for areas less safely reproduced for the small and to not accurately pass this. They should not be compared against field bearings.

Copyright © 2004 by John Wiley & Sons, Inc.

THE UNIVERSITY OF CHICAGO LIBRARY

Figure 184 depicts 20 to 30 mass analyzer designations, replacing the old system of classifying analyzers as Mass, Micro and Macro Analyser. This new system is in line with our fundamental Protection Policy (PP-3) and the Water Framework Directive (WFD) and is based on British Standard Survey nomenclature.

The Aquifer Editors are not responsible for errors greater than 1/2% (0.005) of the total area with exception to the level and is not accurate more than.

Understanding the Human Condition: Society & Culture

[illegible]

When more sampling is required, our generalized algorithm may be useful for determining the value of the number of the function affecting robustness. The next step will be discussed later in §5.5.5.

The *Open-Source Vulnerability Scanning* project provides technical information about how the new tools have been created.

These reports have been published on 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846,

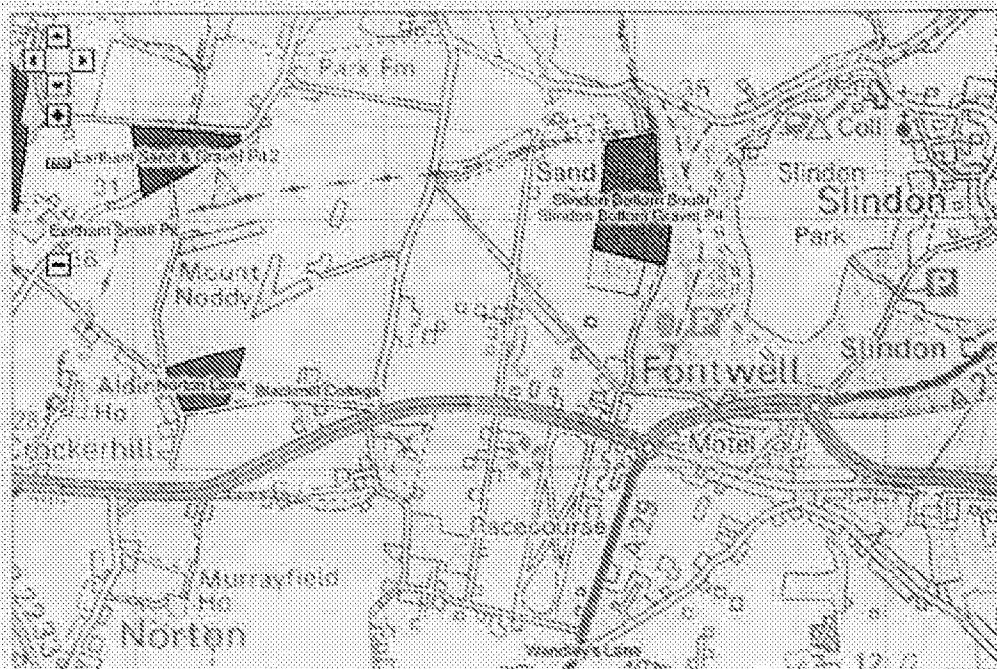
~~~~~

Waste

**Life**

1111 1111 1111 1111

.....



This document is designed to inform members of the public, as well as interested stakeholders, for business or commercial use. Please contact us at [info@environmentalcanada.ca](mailto:info@environmentalcanada.ca) for more information.

The UK produces about 220 million tonnes of controlled waste per year. Find out about waste avoidance, hazardous waste, recycling and landfill.

Author: Environment Agency | [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)  
(last updated: 23rd February 2012)

## APPENDIX B

### Deans Yard, Orchard Way Fontwell, Sussex

#### Trial Pit Logs

|                 |                |                                                            |
|-----------------|----------------|------------------------------------------------------------|
| Trial Pit No. 1 | 0 to 0.25m     | Sandy gravel, glass                                        |
|                 | 0.25m to 0.40m | Brown silty clay and gravel                                |
| Trial Pit No. 2 | 0 to 0.10m     | Gravel, tile, brick                                        |
|                 | 0.10 to 0.30m  | Topsoil with gravel                                        |
| Trial Pit No. 3 | 0 to 0.25m     | Sandy silt, concrete, tile, tarmac                         |
|                 | 0.25 to 0.40m  | Brown silty clay, topsoil                                  |
| Trial Pit No. 4 | 0 to 0.25m     | Sandy soil, brick, mortar, gravel                          |
|                 | 0.25 to 0.40m  | Brown silty clay with flint gravel                         |
| Trial Pit No. 5 | 0 to 0.28m     | Concrete debris, brick, tarmac                             |
|                 | 0.28 to 0.40m  | Brown silty clay with flint gravel                         |
| Trial Pit No. 6 | 0 to 0.25m     | Soil, gravel, brick, mortar, concrete                      |
|                 | 0.25 to 0.35m  | Topsoil with flint gravel<br>(Brick falling into borehole) |

| Project Title : DEAN'S YARD FONTWELL                                                                  |                  |           |             |                        | Project No.:       |                      |
|-------------------------------------------------------------------------------------------------------|------------------|-----------|-------------|------------------------|--------------------|----------------------|
| TRIAL PIT RESULTS                                                                                     |                  |           |             |                        | Pit No. & Location |                      |
| Date : 15 - 03 - 17 Engineer : <span style="background-color: black; color: black;">[REDACTED]</span> |                  |           |             |                        | TP 7               |                      |
| Ground Level                                                                                          |                  |           |             |                        |                    |                      |
| Description                                                                                           | Depth (m)        | Soil Type | Soil Colour | Soil Moisture          | Soil Samples       | Remarks              |
| TORSION, fine sand                                                                                    |                  |           |             |                        |                    |                      |
| Light brown silty CLAY with angular flint GRAVEL                                                      | 0.30             |           |             |                        | P                  | N = 16 blows / 300mm |
|                                                                                                       |                  |           |             |                        | P                  | N = 31 ~ ~ ~         |
|                                                                                                       |                  |           |             |                        | P                  | N = 52 ~ ~ ~         |
| Angular flint GRAVEL with brown silty CLAY                                                            | 1.50             |           |             |                        |                    | P1                   |
| Trail pit dug to 2.0m, lower section collapsed.                                                       | 2.00             |           |             |                        |                    |                      |
|                                                                                                       |                  |           |             |                        |                    |                      |
|                                                                                                       |                  |           |             |                        |                    |                      |
|                                                                                                       |                  |           |             |                        |                    |                      |
|                                                                                                       |                  |           |             |                        |                    |                      |
|                                                                                                       |                  |           |             |                        |                    |                      |
|                                                                                                       |                  |           |             |                        | P                  | N = 14 blows / 300mm |
|                                                                                                       |                  |           |             |                        | P                  | N = 25 ~ ~ ~         |
|                                                                                                       |                  |           |             |                        | P                  | N = 42 ~ ~ ~         |
|                                                                                                       |                  |           |             |                        |                    | P2                   |
|                                                                                                       |                  |           |             |                        |                    |                      |
|                                                                                                       |                  |           |             |                        |                    |                      |
|                                                                                                       |                  |           |             |                        |                    |                      |
| INSITU TESTS :-                                                                                       |                  |           |             |                        |                    |                      |
| KEY :-                                                                                                |                  |           |             | Shear strength in k Pa |                    |                      |
| D                                                                                                     | Disturbed sample |           |             | P                      | Penetrometer       | ( PER 74 )           |
| B                                                                                                     | Bulk sample      |           |             | V                      | Vane test          |                      |
| W                                                                                                     | Water sample     |           |             |                        |                    |                      |
| U                                                                                                     | Undisturbed      |           |             |                        |                    |                      |

## **APPENDIX C**

**Deans Yard, Orchard Way  
Fontwell, Sussex**

### **Chemical Assay Results**



2683



Unit A2  
Windmill Road  
Ponswood Industrial Estate  
St Leonards on Sea  
East Sussex  
TN38 9BY  
Telephone: (01424) 718618  
Facsimile: (01424) 729911  
[info@elab-uk.co.uk](mailto:info@elab-uk.co.uk)

---

**THE ENVIRONMENTAL LABORATORY LTD**

---

Analytical Report Number: 17-11273

Issue: 1

Date of Issue: 29/03/2017

Contact: Keith Elson

Customer Details: W.K. Elson  
Orchard End  
7 Finches Court  
Lindfield  
Sussex RH16 2PG

Quotation No: Q14-00023

Order No: Not Supplied

Customer Reference: Not Supplied

Date Received: 21/03/2017

Date Approved: 29/03/2017

Details: Dean's Yard Fontwell Sussex

Approved by:



John Wilson, Operations Manager

---

*Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)*

---



## Sample Summary

Report No.: 17-11273

| Elab No. | Client's Ref. | Date Sampled | Date Scheduled | Description      | Deviations |
|----------|---------------|--------------|----------------|------------------|------------|
| 93760    | TP1 0.35      | 15/03/2017   | 21/03/2017     | Sandy silty loam |            |
| 93761    | TP2 0.25      | 15/03/2017   | 21/03/2017     | Silty loam       |            |
| 93762    | TP3 0.35      | 15/03/2017   | 21/03/2017     | Silty loam       |            |
| 93763    | TP4 0.35      | 15/03/2017   | 21/03/2017     | Silty loam       |            |
| 93764    | TP5 0.35      | 15/03/2017   | 21/03/2017     | Silty loam       |            |
| 93765    | TP6 0.30      | 15/03/2017   | 21/03/2017     | Silty loam       |            |



# Results Summary

Report No.: 17-11273

| ELAB Reference                   |       |          |     | 93760      | 93761      | 93762      | 93763      | 93764      | 93765      |
|----------------------------------|-------|----------|-----|------------|------------|------------|------------|------------|------------|
| Customer Reference               |       |          |     |            |            |            |            |            |            |
| Sample ID                        |       |          |     |            |            |            |            |            |            |
| Sample Type                      |       |          |     | SOIL       | SOIL       | SOIL       | SOIL       | SOIL       | SOIL       |
| Sample Location                  |       |          |     | TP1        | TP2        | TP3        | TP4        | TP5        | TP6        |
| Sample Depth (m)                 |       |          |     | 0.35       | 0.25       | 0.35       | 0.35       | 0.35       | 0.30       |
| Sampling Date                    |       |          |     | 15/03/2017 | 15/03/2017 | 15/03/2017 | 15/03/2017 | 15/03/2017 | 15/03/2017 |
| Determinand                      | Codes | Units    | LOD |            |            |            |            |            |            |
| <b>Metals</b>                    |       |          |     |            |            |            |            |            |            |
| Arsenic                          | M     | mg/kg    | 1   | 6.6        | 5.0        | 3.7        | 4.8        | 5.5        | 8.8        |
| Cadmium                          | M     | mg/kg    | 0.5 | < 0.5      | < 0.5      | < 0.5      | < 0.5      | < 0.5      | < 0.5      |
| Chromium                         | M     | mg/kg    | 5   | 13.1       | 12.4       | 10.1       | 14.3       | 12.7       | 13.9       |
| Copper                           | M     | mg/kg    | 5   | 19.8       | 20.7       | 29.4       | 15.3       | 41.3       | 37.4       |
| Lead                             | M     | mg/kg    | 5   | 77.3       | 54.8       | 63.3       | 24.1       | 44.8       | 43.8       |
| Mercury                          | M     | mg/kg    | 0.5 | < 0.5      | < 0.5      | < 0.5      | < 0.5      | < 0.5      | < 0.5      |
| Nickel                           | M     | mg/kg    | 5   | 8.1        | 6.8        | < 5.0      | 6.9        | 6.2        | 6.8        |
| Selenium                         | M     | mg/kg    | 1   | < 1.0      | < 1.0      | < 1.0      | < 1.0      | < 1.0      | < 1.0      |
| Zinc                             | M     | mg/kg    | 5   | 87.5       | 80.3       | 80.7       | 56.8       | 68.5       | 71.5       |
| <b>Inorganics</b>                |       |          |     |            |            |            |            |            |            |
| Hexavalent Chromium              | N     | mg/kg    | 0.8 | < 0.8      | < 0.8      | < 0.8      | < 0.8      | < 0.8      | < 0.8      |
| Water Soluble Boron              | N     | mg/kg    | 0.5 | 1.0        | 1.1        | 0.6        | < 0.5      | < 0.5      | < 0.5      |
| <b>Miscellaneous</b>             |       |          |     |            |            |            |            |            |            |
| pH                               | M     | pH units | 0.1 | 8.2        | 7.3        | 7.6        | 7.7        | 7.5        | 7.8        |
| <b>Organics</b>                  |       |          |     |            |            |            |            |            |            |
| >C8-C10 BCB                      | N     | mg/kg    | 1   | n/l        | n/l        | n/l        | < 1.0      | < 1.0      | n/l        |
| >C10-C12 BCB                     | N     | mg/kg    | 1   | n/l        | n/l        | n/l        | < 1.0      | < 1.0      | n/l        |
| >C12-C16 BCB                     | N     | mg/kg    | 1   | n/l        | n/l        | n/l        | < 1.0      | < 1.0      | n/l        |
| >C16-C21 BCB                     | N     | mg/kg    | 1   | n/l        | n/l        | n/l        | 7.7        | 2.7        | n/l        |
| >C21-C35 BCB                     | N     | mg/kg    | 1   | n/l        | n/l        | n/l        | 171        | 38.7       | n/l        |
| >C35-C40 BCB                     | N     | mg/kg    | 1   | n/l        | n/l        | n/l        | 62.5       | 24.4       | n/l        |
| Total (>C8-C40) BCB              | N     | mg/kg    | 1   | n/l        | n/l        | n/l        | 232        | 65.7       | n/l        |
| <b>Polyaromatic hydrocarbons</b> |       |          |     |            |            |            |            |            |            |
| Naphthalene                      | M     | mg/kg    | 0.1 | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
| Acenaphthylene                   | M     | mg/kg    | 0.1 | < 0.1      | 0.1        | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
| Acenaphthene                     | M     | mg/kg    | 0.1 | 0.8        | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
| Fluorene                         | M     | mg/kg    | 0.1 | 0.5        | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
| Phenanthrene                     | M     | mg/kg    | 0.1 | 2.6        | 0.9        | 0.2        | < 0.1      | < 0.1      | 0.1        |
| Anthracene                       | M     | mg/kg    | 0.1 | 0.9        | < 0.1      | < 0.1      | < 0.1      | < 0.1      | < 0.1      |
| Fluoranthene                     | M     | mg/kg    | 0.1 | 2.6        | 1.5        | 0.4        | 0.1        | 0.3        | 0.9        |
| Pyrene                           | M     | mg/kg    | 0.1 | 2.1        | 1.3        | 0.4        | 0.2        | 0.2        | 0.8        |
| Benzo(a)anthracene               | M     | mg/kg    | 0.1 | 1.0        | 0.9        | < 0.1      | < 0.1      | 0.2        | 0.7        |
| Chrysene                         | M     | mg/kg    | 0.1 | 1.1        | 1.1        | < 0.1      | 0.1        | 0.2        | 0.7        |
| Benzo(b)fluoranthene             | M     | mg/kg    | 0.1 | 0.7        | 1.2        | 0.6        | 0.2        | 0.2        | 0.8        |
| Benzo(k)fluoranthene             | M     | mg/kg    | 0.1 | 1.1        | 0.9        | 1.2        | 0.4        | 0.4        | 1.3        |
| Benzo(a)pyrene                   | M     | mg/kg    | 0.1 | 0.8        | 1.2        | < 0.1      | 0.3        | 0.2        | 1.0        |
| Indeno(1,2,3-cd)pyrene           | M     | mg/kg    | 0.1 | 0.7        | 0.8        | < 0.1      | < 0.1      | 0.2        | 0.9        |
| Dibenzof(a,h)anthracene          | M     | mg/kg    | 0.1 | 0.2        | 0.2        | < 0.1      | < 0.1      | < 0.1      | 0.2        |
| Benzo(g,h,i)perylene             | M     | mg/kg    | 0.1 | 0.6        | 0.8        | < 0.1      | < 0.1      | 0.2        | 0.6        |
| Total PAH(16)                    | M     | mg/kg    | 0.4 | 15.7       | 10.3       | 3.2        | 1.1        | 2.2        | 8.2        |

Tests marked N are not UKAS accredited.  
The Environmental Laboratory Ltd. Reg. No. 3382188



## Method Summary

Report No.: 17-11273

| Parameter                     | Codes | Analysis Undertaken On | Date Tested | Method Number | Technique   |
|-------------------------------|-------|------------------------|-------------|---------------|-------------|
| <b>Soil</b>                   |       |                        |             |               |             |
| Hexavalent chromium           | N     | As submitted sample    | 24/03/2017  | 110           | Colorimetry |
| pH                            | M     | Air dried sample       | 27/03/2017  | 113           | Electronic  |
| Aqua regia extractable metals | M     | Air dried sample       | 24/03/2017  | 116           | ICPMS       |
| PAH (GC-FID)                  | M     | As submitted sample    | 23/03/2017  | 133           | GC-FID      |
| Water soluble boron           | N     | Air dried sample       | 24/03/2017  | 202           | Colorimetry |
| Basic carbon banding in soil  | N     | As submitted sample    | 23/03/2017  | 216           | GC-FID      |
| Asbestos identification       | U     | As submitted sample    | 23/03/2017  | PMAN          | Microscopy  |

Tests marked N are not UKAS accredited



## Report Information

Report No.: 17-11273

### Key

---

|     |                                                                          |
|-----|--------------------------------------------------------------------------|
| U   | hold UKAS accreditation                                                  |
| M   | hold MCERTS and UKAS accreditation                                       |
| N   | do not currently hold UKAS accreditation                                 |
| A   | MCERTS accreditation not applicable for sample matrix                    |
| *   | UKAS accreditation not applicable for sample matrix                      |
| S   | Subcontracted to approved laboratory UKAS Accredited for the test        |
| SM  | Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test |
| I/S | Insufficient Sample                                                      |
| U/S | Unsuitable sample                                                        |
| n/t | Not tested                                                               |
| <   | means "less than"                                                        |
| >   | means "greater than"                                                     |

Soil sample results are expressed on an air dried basis (dried at < 30°C)

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

### Deviation Codes

- 
- |   |                                                          |
|---|----------------------------------------------------------|
| a | No date of sampling supplied                             |
| b | No time of sampling supplied (Waters Only)               |
| c | Sample not received in appropriate containers            |
| d | Sample not received in cooled condition                  |
| e | The container has been incorrectly filled                |
| f | Sample age exceeds stability time (sampling to receipt)  |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

### Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage