

## Sandford Farm– Submission of Evidence and Research

### Critical Safety Issues relating to development of previous landfill site

#### In Support of Objections to Developments relating to:

- O/2008/1282..... Sandford Farm Development
- RM/2008/1585&88..Reserved Matters Training Centre/Hotel).
- F/2007/1690.....(currently under Appeal)

2WD111.....Wokingham Borough Submission Core Strategy (SCS) with the associated Strategic Housing Land Availability Assessment (SHLAA) :-  
Replacing the Wokingham District Local Plan (WDLP).  
Objection to policy CP18.

Prepared by :-



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#### **With additional input and acknowledgements to :-**

- |   |   |
|---|---|
| • Prof. Sharon Beder (B. Engineering, Masters Engineering, PhD)   | <i>Consulted on Environmental Impact Statements and their validity.</i> |
| • Usha Naidu (Solicitor in Law, England & Wales)  | <i>Consulted on legal aspects</i>                                       |
| • Collins Solicitors (Civil Litigation Department)  | <i>Consulted on Corby legal case</i>                                    |
| • Dr. Jeremy Lade – MD, Berkshire Healthcare NHS Foundatn Trust   | <i>Extensive Medical information supplied</i>                           |
| • Royal Institute of Chartered Surveyors  | <i>Consulted on relevant standards</i>                                  |
| • Dr Bojen Flacks - Toxicologist and Environmental Consultant (BSc, PhD, FRCPath, DSc, FIBiol, CBiol, MIBiol) | <i>Consulted on Toxicology</i>  |
| • Wayne Ingham, WESA Environmental Consulting   | <i>Consulted on site reclamation.</i>                                   |

With additional thanks to the following individuals for initial proof-reading:-

- |  |                                   |
|--|-----------------------------------|
| • Matt Provis (Previous Royal Navy RAF Engineer) | <i>Loddon Valley Action Group</i> |
|--|-----------------------------------|

With special thanks to the following individual for detailed reading of submission and other documentation for relevant information, as well as extensive proof-reading and printing:-

- |                   |                                   |
|-------------------|-----------------------------------|
| • Joanne Playfair | <i>Loddon Valley Action Group</i> |
|-------------------|-----------------------------------|

## Sandford Farm – Submission of Evidence and Research Sandford Farm Safety Submission - Exec Overview

To quote Wokingham Borough Council's contaminated land strategy "Landfills were and are a significant local public concern and have been the main priority for risk assessment in the work of implementing the Council's first strategy."

As is detailed in this document there are a number of critical concerns about the development on the Sandford Farm site, a previously industrial waste site of approximately 300,000 m<sup>3</sup> in volume housed in an ex-gravel pit in a residential area.

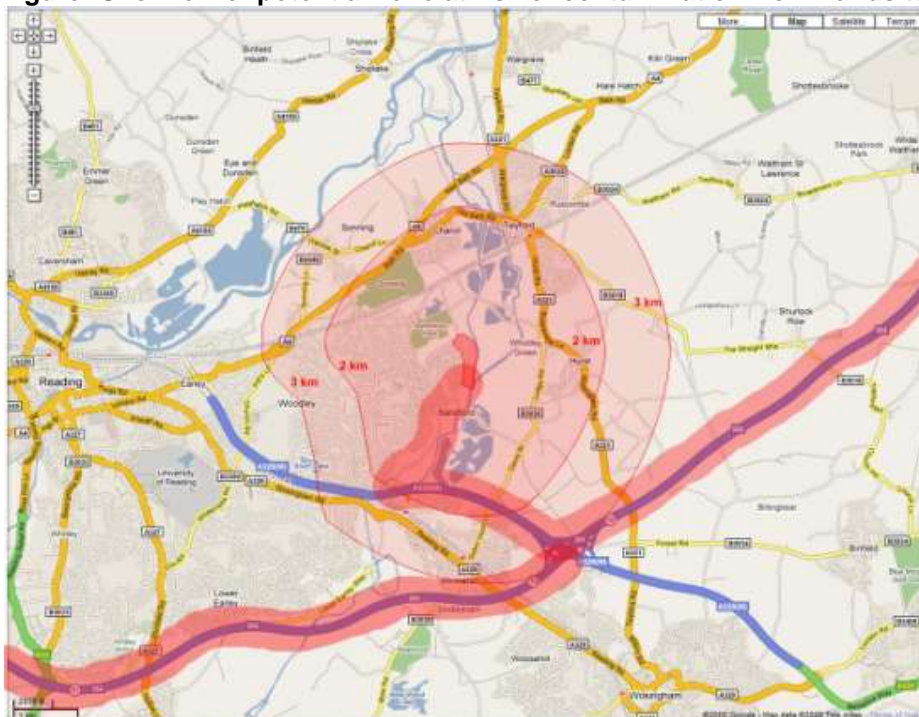
Firstly this site's historical waste records indicate that **substantial toxic wastes** are stored at this site, and their uncovering would represent an unacceptable risk to the community.

Secondly the **health risks** to the community from uncovering this site represent a serious and proven epidemiological risk in terms of causing long-term cancer, birth defects and other long-term abnormalities – as is cited in numerous research articles; these risks have been demonstrated in research to be significantly increased by uncovering existing waste deposits. Unless the site amelioration technique prevents **any** air, water or soil contamination it stands to significantly increase risk to the surrounding population. The currently proposed site treatment technique is totally inadequate for this task, and is designed for engineering cost-minimisation rather than safe toxic site decontamination.

Thirdly the commissioned environmental submission presented by the RSK group must be **seriously questioned** in terms of its thoroughness, conclusions, suggested treatment techniques and potential commercial bias due to the commercial incentives such a multi-million pound site contract would attract.

Finally the **legal liability** to the council and its officers, far from being covered by a developers bond; would leave the council open to future personal damage and safety litigation under UK civil law. As such this development represents a large and unquantifiable legal and financial risk to the borough council and its rate-payers.  
*Furthermore the applicant developers are legally registered in a series of newly formed offshore companies.*

**Figure: Overview of potential zone at risk of contamination from Landsite excavation**



The above figure (explained in depth later) details the probable 2 and 3km radius of long-term health impact following site excavation, including the route for the estimated route.

Note that we have not included for the impact of prevailing wind, which would be expected to spread effects further to the East, as well as potential impacts from the transport routes.

In conclusion based on the force of the evidence the site should be left undisturbed and barred from any further development works.

## List of attached Documents:-

### Key Articles on the risks of Open Landfills

1. “Risk of Congenital Anomalies after the Opening of Landfill Sites”  
Journal: Environ Health Perspect. 2005 October; 113(10): 1362–1365.  
*Stephen R. Palmer, Frank D.J. Dunstan, Hilary Fielder, David L. Fone, Gary Higgs, and Martyn L. Senior*  
*Department of Epidemiology, Statistics and Public Health, Wales College of Medicine, Cardiff, Wales.*  
*GIS Research Centre, School of Computing, University of Glamorgan, Pontypridd, Wales*  
*Department of City and Regional Planning, Cardiff University, Cardiff, Wales*
2. “Risk of adverse birth outcomes in populations living near landfill sites.”  
British Medical Journal, 2001 August 18; 323(7309): 363–368  
*Paul Elliott, director, David Briggs, professor of environment and health, Sara Morris, research associate, Cornelis de Hoogh, research associate, Christopher Hurt, research associate, Tina Kold Jensen, lecturer, Ian Maitland, database manager, Sylvia Richardson, professor of statistics, Jon Wakefield, reader in statistics, and Lars Jarup, assistant director.*  
Small Area Health Statistics Unit (SAHSU), Department of Epidemiology and Public Health, Imperial College.
3. “Hazardous Waste Sites and Effects on Health.”  
Dr D Van Steenis MBBS. 2nd July 1999.
4. “Comments on Landfill Gas and Plantlife.”  
Professor R.J. Summerfield. (BSc, PhD, DSc, CBoil, FIBoil). Nov, 1990
5. “Investigation of Cancer Incidence near 38 Landfills with Soil Gas Migration Conditions :New York State, 1980-1989.” July 1989  
State of New York, Department of Health. Centre for Environmental Health
6. “Evidence provided by Dr Rowe.” [to earlier submission], 1989  
*Dr. Rowe (B. Medicine and Surgery, Fellow of the Royal College of Pathologists) – Evidence Submitted, 1989*
7. “Toxic Chemical Releases.” F.J. Steinbrenner, 1989 (Georgia, USA)

### Key Articles on the risks of Airborne Pollution

1. “The Effect of Air Pollution on Lung Development from 10 to 18 Years of Age”  
New England Journal of Medicine, 9<sup>th</sup> September, 2004, Vol 351, No. 11  
*W. James Gauderman, Ph.D., Edward Avol, M.S., Frank Gilliland, M.D., Ph.D., Hita Vora, M.S., Duncan Thomas, Ph.D., Kiros Berhane, Ph.D., Rob McConnell, M.D., Nino Kuenzli, M.D., Fred Lurmann, M.S., Edward Rappaport, M.S., Helene Margolis, Ph.D., David Bates, M.D., and John Peters, M.D.*
1. “An Association between Air Pollution and Mortality in Six U.S. Cities”  
New England Journal of Medicine, Volume 329:1753-1759, December 9, 1993, No. 24  
*Douglas W. Dockery, C. Arden Pope, Xiping Xu, John D. Spengler, James H. Ware, Martha E. Fay, Benjamin G. Ferris, and Frank E. Speizer*

### Official Documents

1. Various cuttings relating to the Corby Toxic Site remediation court-case, *currently underway in the UK courts.*
2. “Report on the Available Data and Identification and Assessment of Medium to Long-term Options on Sandford Farm Planning Application.”  
Report by RPS Technology prepared for Wokingham Borough Council, November 1996
3. “RPS Group – Review of Environmental Statement for Planning Application O/2008/1282”, 22<sup>nd</sup> Aug, 2008
4. “RSK Group – Assessment and Remediation Strategy”, 2008

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## Chemical Waste Concerns



“The excavation and removal option is, based on current information, likely to have significant risks associated with environmental pollution, health risk, noise and other environmental impact during the period of removal and refilling.”  
 “There are significant and unquantified risks to the health, safety and environment of residents and occupants on the adjacent to the Sandford Farm landfill.”

- Source: Report by RPS Technology for Wokingham Borough Council, November 1996

### Chemical Waste Documentation

Chemical wastes represent a little understood and perhaps over-complicated component of the site. The background waste usages of the site are documented in several archives documents and include the following from the 1982 Waste disposal licence; and amendments 1984, 1985, 1986 and 1987.

| Wastes  |  |
|---|--|
| Slag including boiler and flue cleanings J20  | Interceptor pit wastes with not more than 10% oil content R20                              |
| Mineral processing waste J30  | Printing industry waste (ink manufacture and waste) R30                                    |
| Silt and dredgings J40  | Dyestuffs waste R40  |
| Metal scrap J60   | Distillation residue R50   |
| Finished products and manufacturing scrap L20   | Tar, pitch, bitumen and asphalts R70   |
| Scrap Rubber (including tyres) L30  | Paint waste R80  |
| Latex L40   | Tannery and fellmongers waste S10  |
| Synthetic adhesive wastes L50   | Cellulose waste (natural and synthetic) S20  |
| Ion exchange resin wastes L60   | Waste treated Timber S30   |
| Pharmaceuticals and cosmetic wastes N10<br>By prior written agreement from the Waste Disposal Authority         | Soap and detergents S50  |
| Used Filter materials (eg Kiesleguhr, carbon filter cloths)   | Other industrial wastes *2<br>By prior written agreement from the Waste Disposal Authority |
| Contaminated rubbish (including bags and sacks) Q20   | Animal processing wastes T10   |
| Empty used containers Q30   | Food Processing wastes T20   |
| Industrial effluent treatment sludge cake<br>By prior written agreement from the Waste Disposal Authority<br>*1 | Glue wastes T30  |
| Contaminated soil and rubble Q50<br>By prior written agreement from the Waste Disposal Authority                | Hard asbestos products   |

Source: UK Environmental Agency letter on Sandford Farm waste site – Ref: SE13762, Sent 16<sup>th</sup> July, 2008

Notes from above:-

- \*1 24/12/1985 Metal Hydroxide Filter cake from effluent plant, BAC Bristol.  
 6/3/1986 Chalk contaminated with oil hydrocarbon sludge, Kingsclere  
 1985 Paper and putrescible waste material together with certain ‘difficult wastes’  
 \*2 11/1985 Adhesive wastes, Bracknell

Source: Environment Agency Letter Ref: SS/JAN/12933/CJ60 16/July/1996

## Lack of reliable site documentation

While the above 1982 waste-disposal licence and amendments, show what wastes were permitted on the site, very little site documentation is apparently available from the various regulatory agencies, previous or current site-owners as to what wastes were *actually* deposited at the site.

### FOI [Freedom of Information] Submissions

The following UK Govt Agencies were contacted under UK FOI and EU EIR freedom of information legislation, however to date no additional information has been forwarded beyond that originally supplied by the EA documenting the works submission; and only two UK agencies (the UK Environmental Agency and Wokingham Borough Council – to both of their credit!) are following up on the FOI applications.

| Govt Agency               | Date Contacted           | Date Acknowledged                           | Date committed to respond by     | Current status  |
|---------------------------|--------------------------|---|----------------------------------|---|
| DEFRA                     | 6/8/2008                 | 6/8/2008                                    | Closed 8 <sup>th</sup> Aug 2008  | Rejected–“No information available”<br>Redirected FOI request to EPA.<br>Email – dated 8/8/2008 |
| Environmental Agency      | 8 <sup>th</sup> Aug 2008 | 8 <sup>th</sup> Aug 2008<br>Ref: 080808jm02 | 25 <sup>th</sup> Aug 2008        | Documentation and information available on basic water and landfill gas testing supplied.       |
| Wokingham Borough Council | 8 <sup>th</sup> Aug 2008 | 13 <sup>th</sup> Aug 2008<br>Ref: AXLR8-572 | 5 <sup>th</sup> Sept 2008        | Limited information available.  |
| UK Land Registry          | 8 <sup>th</sup> Aug 2008 | None  | Closed 12 <sup>th</sup> Aug 2008 | Rejected Land Registry apparently “do not hold the records”<br>– Email dated 12/8/2008          |

**Table: UK FOIA and EU EIR Freedom of Information Submission Summary**

The lack of detailed site documentation for such a site is highly concerning, especially given the documented usage of the site according to the EPA works submission; which include a number of highly toxic source industries, as will be documented later.

In addition “...bio-degradable waste was found in large areas which should have only received inert waste...’ ‘...there will be similar residual uncertainties about isolated deposits of more hazardous or malodorous wastes.’

*Source: RPS Technology Report Sept. 1997.*

## Sandford Farm – Submission of Evidence and Research UK Government Reports on Toxic Wastes

It is apparent from the lack of any detailed wastes documentation and official reports that this site operated in what was a very different UK regulatory waste disposal environment in the period of operation [’82-’92] and that aside from the above documentation, no detailed records are available to date; which is highly concerning in and of itself.

It should be noted that the “Role of the County Council, as Waste Reg. Auth., has been to licence and reasonably monitor....the site.’..in accordance with customs and practice on landfill sites at the time.”

*Source: Country Environment Officer to Planning Committee Agenda Item 6: 4/12/96*

The following two government publications highlights the relatively loose regulatory environment that prevailed in this period:-

### **House of Commons – Session 1988/1989 – Environment Committee, 2<sup>nd</sup> Report Toxic Waste – Volume 1**

“Never in any of our enquiries into environmental problems, have we experienced such consistent and universal criticism of existing legislation and of central and local government as we have during the course of this inquiry.”

[In rating Waste Disposal Inspection across the entire UK] “Three WDAs [Waste Disposal Authorities] – East Sussex, West Sussex and **Berkshire could not supply figures on numbers of inspections at all**”.

### **House of Lords – Session 1988/1989 – 4<sup>th</sup> Report, Select Committee on Science and Technology - Hazardous Waste Disposal, Report with Evidence**

“8 Years after making their 1<sup>st</sup> report on Hazardous Waste Disposal the committee are dismayed at how little has changed...” “the standards of control by local authorities still vary widely....”  
“incidence of pollution by waste continue”

## ***Additional Unauthorised Commercial Dumping***

In addition there is documentary evidence of unauthorised commercial site dumping at the site, as shown below:-

There are 3 notes in the file covering the period February 1984 to November 1986 detailing unauthorised deposits of food waste, unauthorised deposits of solvent based sludges and the presence on site of vehicles suspected of depositing unauthorised wastes.

There are 2 letters on file from BCC to Summerleaze threatening action in respect of witnessed deposits of unauthorised commercial waste and the repeated presence on site of vehicles containing commercial wastes. Neither of these letters correlate with records of inspections.

The licence did contain restrictions limiting the input of specified difficult wastes to 1% and 10% of the daily inert waste input however it is not known how or whether this was enforced.

There is a file note dated November 1985 referring to disposal at the site of 15 x 45 gallon drums per month of a pink solid adhesive wastes smelling of chlorinated solvent. Approval was given for the disposal of effluent filter cake in December 1985, oil contaminated chalk in February 1986, mud and oil sludge in March 1986 and PFA in November 1986 although the disposal of an "industrial effluent cake" was refused in the absence of sufficient information.

Source: Papers from Environmental Agency Archives.

## **Environmental Agency Data - Site Analysis of Water and Gasses**

While only limited reporting from the Environmental Agency was available in time for the writing of this report, the following important facts may be noted:-

- a) **Water Tests:** All of the current Environmental agency water tests to date do not appear to include heavy metals toxins (Hg, Ar, Se, Cr, Cr<sup>6+</sup>, Cd, Pb, etc), Volatile Organic Hydrocarbons (VOCs) or indeed the other more toxic chemicals suspected at the site.
- b) **Landfill Gas Tests:** Similarly the Environmental Agency landfill gas tests do not include VOCs, PCBs (Polychlorinated Biphenyls (PCBs), PAHs (Polynuclear Aromatic Hydrocarbons), Dioxins/Furfans or other toxic and potentially airborne particles. Although that is the case, the current literature is clear that in the vast majority of cases contaminants in landfill flue gasses are expected.
- c) **Soil Samples:** No soil samples we available from the Environmental Agency for any part of the site; although given the documented site usage, un-authorized deposits of various commercial wastes, the lack of proper detailed site-documentation; and given the non-uniform nature of the wastes deposited at the site - ***it is difficult to even envision a soil sampling regime that would properly measure the risks from the currently unexposed site materials!***

## Record Analysis - Introduction

To date the main analysis of the site has consisted of monitoring gasses from the site – namely mostly Methane from the decomposition of the existing paper Cellulose material and other unidentified putrescible materials.

It should be noted that other gaseous contaminants are expected and a limited number of bore-holes commissioned by the RSK group on behalf of the developers.

While the exact chemical composition of the waste-dump is impossible without a thorough excavation and chemical analysis of the entire waste dump (something impossible without significant potential risk) based on an examination of the existing waste records and the limited site analysis done to date the following conclusions can be drawn in terms of source-industries and typically used chemicals.

### ***Key Chemicals of Concern***

The following are some of the key chemicals of concern; it should be noted that this list is not comprehensive, and there are many other chemicals of concern probably stored at this site which have significant public health and safety concerns, a partial short-list of some key chemicals is included :-

- Metals
- Total petroleum hydrocarbons
- Polycyclic aromatic hydrocarbons
- Chlorinated hydrocarbons
- Polychlorinated biphenyls
- Pesticides
- Methane
- Dioxins
- Asbestos
- Pharmaceuticals
- Pathogens

*Source: Lesley Rushton, Dept. Epidemiology and Public Health, Imperial Collage London)*

**Source-industries and Associated Chemical Groupings**

While detailed records from the site owner are apparently no longer available (and pre-date detailed waste disposal record requirements in the UK) the sources of much of the waste are self-evident from existing records, as seen above – additionally the following chemical sources are typically associated with various industry types.

**Table - Contaminants generally associated with industry types**

| Industry   | Examples of Sites   | Likely Contaminants   |
|--|---|---|
| Chemicals  | Acid / Alkali works<br>Dyeworks<br>Fertilizers and pesticides<br>Pharmaceuticals<br>Paint Works<br>Wood treatment plants<br>Laundries   | Acids; alkali's, metals, solvents, (e.g. toluene, benzene), phenols, specialised organic compounds.     |
| Petrochemicals   | Oil refineries<br>Tank farms<br>Fuel Storage depots<br>Tar distilleries   | Hydrocarbons, phenols, acids, alkalis and asbestos  |
| Metals   | Iron & Steel works<br>Foundries and smelters<br>Electroplating, anodizing and galvanising works<br>Engineering works<br>Shipbuilding / shipbreaking<br>Scrap reduction plants | Metals, especially Fe, Cu, Ni, Cr, Zn, Cd and Pb, asbestos  |
| Energy   | Gasworks<br>Power Stations  | Combustible substances (e.g. coal and coke dust) phenols, cyanides, sulphur compounds, asbestos         |
| Transport  | Garages, vehicle builders and maintenance workshops.<br>Railway depots  | Combustible substances, hydrocarbons, asbestos.   |
| Mineral extraction<br>Land restoration (including waste disposal sites)  | Mines and spoil heaps<br>Pits and quarries<br>Filled sites  | Metals (e.g. Cu, Zn, Pb), gases (e.g. methane), leachates   |
| Water supply and sewage treatment  | Waterworks<br>Sewage treatment plants   | Metals (in sludges) Micro-organisms.  |
| Miscellaneous  | Docks, wharfs and quays<br>Tanneries<br>Rubber works<br>Military Land   | Metals, organic compounds, methane, toxic, flammable or explosive substances; micro-organisms, asbestos |
| Ubiquitous contaminants include hydrocarbons, polychlorinated biphenyls (PCBs) asbestos, sulphates and many metals used in paint pigments or coatings. These may be present on almost any site |   |   |

(HS(G) 66) – HSE 1991

For brevity some of the key polluting industries are noted below, their key contaminants and the health and safety information available with each chemical or chemical group.

**i) Documented use: Paint industry**

Similarly the paint industry has typically used the following solvents as a basic part of the paint manufacture process:-

This group of chemicals falls under the category of 'Volatile Organic Compounds' which are carbon-containing compounds which evaporate into the atmosphere.

- **Toluene** - Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes.
- **Benzine** - Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides.
- **Xylene** and "Mixed Xylenes" (~ 40% M-Xylene , 20% each of O-Xylene, P-Xylene and Ethylbenzene, plus small quantities of toluene)

Hazards: Additionally the earlier mentioned risks, the above contaminants have been linked with male related abnormal pregnancy outcomes from workers exposed to benzene, toluene, and xylene, with coal-based solvents (e.g., xylene) have been suggested to be possible potent causes of lymphocytic leukaemia.

| <b>Chemical</b>  | <b>Class</b>     | <b>Cancer Links</b>                              | <b>Other health impacts</b>   |
|--|------------------|--|---|
| Antimony   | Human carcinogen | Possible link with lung cancer if inhaled.       | Possible chronic bronchitis, chronic emphysema, inactive tuberculosis, pleural adhesions, and irritation. Possible cardiovascular effects and gastrointestinal disorders.   |
| Arsenic  | Human carcinogen | Cancer of the skin, lung, and bladder in humans. |   |
| Beryllium  | Human carcinogen | Damage to bones and lungs; cancer.               | Inflammation of the lungs when inhaled  |
| Cadmium  | Toxic            | Possible increase in Lung cancer.                | kidney disease, possible long-term impairment of lung function  |
| Chromium (hexavalent)<br><i>Commonly known as "Chromium-6" (Chromium-6 was made famous in the US Hinkley chemical case, and dramatized in the movie "Erin Brockovich")</i> | Toxic            | nasal cancer, sinus cancer,                      | dermal irritation, skin ulceration, allergic contact dermatitis, occupational asthma, nasal irritation and ulceration, perforated nasal septa, rhinitis, nosebleed, respiratory irritation, eye irritation and damage, perforated eardrums, kidney damage, liver damage, pulmonary congestion and edema, epigastric pain, and erosion and discoloration of the teeth. |
| Copper   |                  |  | At higher levels gastrointestinal disturbance, including nausea and vomiting. Use of water that exceeds the Action Level over many years could cause liver or kidney damage.  |
| Lead   | Toxic            | N/A  | Highly neurotoxic (exp. in children); brain and kidney damage. Gastrointestinal symptoms. Increased risk of preterm delivery, low birth weight, and impaired mental development.  |
| Mercury  | Toxic            | N/A  | In some form may be highly neuro-toxic to foetuses, infants, and children.  |
| Nickel   | N/A              | N/A  | At higher levels decreased body weight; heart and liver damage; skin irritation.  |
| Selenium   | N/A              | N/A  | At higher levels hair and fingernail loss; damage to kidney and liver, nervous and circulatory systems.   |
| Thallium   | Toxic            | N/A  | Changes in blood chemistry; damage to liver, kidney, intestinal and testicular tissues; hair loss.  |
| Titanium   |                  |  | Titanium Tetrachloride - Decreased pulmonary  |

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|   |                                      |  |  |
|---|--------------------------------------|--|--|
|   |                                      |  | function.  |
| Herbicide/Fungicide                             | Various components are carcinogenic. | 2,4,5 TP is particularly linked with sarcomas, leukemia, and Non-Hodgkins Lymphomas. | -  |
| Organic Hydrocarbons (volatiles, semivolatiles) | See earlier section.                 | See earlier section on Toluene, Xylene, Benzene, etc                                 | See earlier section on Toluene, Xylene, Benzene, etc |

**Source : US EPA and published Chemical Toxicity Documentation**

Consequently all potentially involved workers, transportation and nearby residents should be longitudinally screened for birth defects and leukaemia for the next several decades.

**ii) Documented use: Tannery and Fellmongers waste**

EPA Waste Classification: Hazardous to extremely hazardous.

Tanneries and Fellmongers have also used **Chromium** and **Arsenic** – both of which are highly toxic and their presence would be expected at some point in the waste materials, although its presence is unlikely to be widespread unless a Tannery or Fellmongers was located on the site. As highlighted above Chromium in particular is a known carcinogen.

| Chemical  | EPA Warnings     | Cancer and other severe health Risk   |
|---|------------------|---|
| Arsenic   | Human carcinogen | Poison & Human carcinogen<br>Linked with skin, lung, bladder, and kidney cancers.   |
| Antimony  | Pending          | -   |
| Beryllium   | -                | -   |
| Vanadium  | -                | Possible effects on blood, neurological development and other organs. Possible carcinogen based on animal studies.  |
| Thallium  | Not classifiable | -   |
| Hexavalent Chromium<br><br><i>Commonly known as "Chromium-6" - which was made famous in the US Hinkley chemical toxicity case (later dramatized in the movie "Erin Brockovich")</i> | Human carcinogen | Strongly linked with lung cancer, even low level exposures.   |
| Polynuclear Aromatic Hydrocarbons (PAHs)  | Human carcinogen | Risk of various forms of cancer.  |
| Polychlorinated Biphenyls (PCBs)  | Highly toxic     | PBCs can include Dioxins and is highly toxic.<br><br>Skin and eye lesions, irregular menstrual cycles, lowered immune response. Poor cognitive development in children. Liver damage, anemia skin conditions stomach, and thyroid gland injuries. Possible human reproduction problems and infant neurological defects.<br><br>Banned in the UK in 1981 |
| Dioxins/Furfans   | Highly toxic     | See above   |
| Volatile Organic Compounds (VOCs)   |                  |   |

Source : US EPA Tannery Wastes and published Chemical Toxicity Documentation

**iii) Documented use: Asbestos from Building & Industrial materials**

Despite assurances from RSK group, there is both documented and expert opinion (from the UK Environment Agency) that the site is known to contain Asbestos, in all forms.

Asbestos is typically used in insulation, fire retardant coatings, concrete, bricks, pipes and fireplace cement, heat, fire, and acid resistant gaskets, pipe insulation, ceiling insulation, fireproof drywall, flooring, roofing, lawn furniture, and drywall joint compound.

While research dating as far back as the early 1900s demonstrated that Asbestos causes pulmonary fibrosis, bronchial carcinoma and mesothelioma; the question remains of whether there is **any** safe exposure level that does not increase the risk of cancer, as more recent research has demonstrated *pulmonary tumours can occur in animals that have been exposed to asbestos for only a single exposure with some forms of asbestos* - namely brown asbestos (Amosite) – which was banned in the UK in 1985; white asbestos (chrysotile) which was only banned in 1999 (Blue Asbestos was banned in the UK in 1970s, although its disposal (both authorised and unauthorised) at such a landfill site is a strong possibility also, given the dates of operation of this site.

It should be noted that this waste dump dates back to 1982s, consequently the presence of any of the various forms of Asbestos is quite likely given the largely unregulated nature of this waste storage site. (White mainly being used domestically, with blue & brown industrially)

| Chemical       | EPA Warnings     | Cancer Risk  |
|----------------|------------------|--|
| Brown Asbestos | Human carcinogen | Strongly linked with lung cancer, even low level exposures.  |
| Blue Asbestos  | Human carcinogen | Strongly linked with lung cancer, even low level exposures.<br>Highly dangerous due to its small fibre size. |
| White Asbestos | Human carcinogen | Risk of lung cancer, especially in smokers.  |

**Source : US EPA and published Chemical Toxicity Documentation**

**Evidence**

Planning Statement - Loddon View application (O/2008/1282).

NHBC Certificate – summary of site history, "**all colours of asbestos suspected**"

**iv) Documented use: Furniture/Wood Manufacturing**

**Table 2 Furniture/Wood Manufacturing and Refinishing Waste Descriptions**

Note that virtually *all* of these chemicals are highly toxic above microscopic doses, leading to a variety of other serious effects, up to and including death at toxic levels.

| Chemical             | EPA Group                           | Cancer Risk  | Other risks  |
|----------------------|-------------------------------------|--|--|
| Ethylene Dichloride  | Group B2-Probable Human Carcinogen  | Colon and rectal cancer via drinking water.                      | EPA  |
| Benzene              | Group A - Known Carcinogen          | Increase in Leukemia @ v.low doses & bone-marrow cancer          |  |
| Toluene              | Group D, not classifiable.          | Unclear  | In children of pregnant women: CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies. Possible link also with increased incidence of spontaneous abortions. |
| Ethyl Benzene        | Group D, not classifiable.          | Note: Possible linked to increased kidney and testicular cancer. | Possible effects on the blood, liver, and kidneys  |
| Chlorobenzene        | Group C - possible human carcinogen | N/A  | Probably effects on liver, kidney and central nervous system damage.   |
| Methyl Ethyl Ketone  | Group D, not classifiable.          | N/A  | Developmental effects, including decreased fetal weight and fetal malformations, have been reported in mice and rats exposed to methyl ethyl ketone via inhalation and ingestion     |
| Carbon Tetrachloride | Group B2-Probable Human Carcinogen  | Probable increase in liver cancer                                | liver and kidney damage  |
| Hexachloroethane     | Group C - possible human carcinogen | Possible liver tumors  | Neurological, liver, and kidney effects  |
| Cresols              | Group C - possible human carcinogen | tumor promoters  | Respiratory tract irritation. Possible effects on the blood, liver, kidney, and central nervous system (CNS), and reduced body weight  |
| Pentachlorophenol    | Group B2-Probable Human Carcinogen  | Increases in liver tumors and two uncommon tumors.               |  |
| Methylene Chloride   | Group B2-Probable Human Carcinogen  | Increased lung and liver cancer                                  | Central nervous system damage  |

*Primary Source: EPA Industry Overview: Furniture/Wood Manufacturing and Refinishing*

Note: The developers (RSK) have outlined in their submission that ***“wood will either be re-cycled by chipping and used as fuel on site in a combined heat and power plant...or combined as required to produce various grades of compost material for use on site” ..(!)***

*- RSK Group PLC Loddon View, Woodley Comprehensive Environmental Assessment & Remediation Strategy*

As should be obvious from the site documentation, **any** materials from this site are potentially highly contaminated with leachates containing a cock-tail of highly toxic chemicals of a carcinogenic nature, and their positioning near any domestic dwelling is potentially highly dangerous. Note that the burning of any such materials would lead to the airborne dissemination of toxic particulates that would be highly dangerous to health and safety.

**v) Documented use: Print-Industry & dyestuffs wastes**

In particular **chromium** and **cobalt** (heavy metals) have been used in various dyes in the past and have been linked with developmental effects included neural tube defects, malformations, and foetal deaths. Also Chromium in certain forms (chromium (VI) ) when inhaled causes lung, liver, kidney, gastrointestinal tract, and circulatory problems.

Additionally **Benzene** and **Toluene** based dyes have been widely used throughout the dying industry in the past. Toluene is strongly linked with both carcinogenicity, decreased fertility in women and birth defects. Additionally recent studies have demonstrated that environmentally relevant low levels of Toluene could disrupt normal prenatal brain development; consequently a safe environmental level for any Toluene exposure is currently difficult to quantify.

Similarly for **Benzene** - while chronic higher level exposure to Benzene has been strongly linked to an increased incidence of acute myelogenous leukaemia (AML) recent research has suggested a cancer risk for airborne concentrations of as low as 1 ppb (1 part per billion!) to 10 ppm, a range possible by unearthing even the smallest concentrations of this material.

The following table lists other toxic chemicals that are expected in print and dyestuff wastes.

**Table - Hazardous Waste from the Production of Dyes and Pigments**

| Chemical               | EPA Warnings    | Cancer Risk   | Other potential risks   |
|------------------------|-----------------|---|---|
| Aniline                | Highly toxic    | -   | Lung damage   |
| o-anisidine            | Acutely toxic   | Possible carcinogen. Possible link with cancer of bladder, kidneys and thyroid. | tumours of the urinary bladder in male and female rats and mice, in the pelvis of the kidney in male rats, and in the thyroid of male rats. |
| 4-chloroaniline        | EPA Hazard list | -   | Spleen damage   |
| p-cresidine*           | EPA Hazard list | Possible tumours of Kidney, Urethra, Bladder and Brain.                         | -   |
| 1,2-phenylenedi amine* | EPA Hazard list | Possible carcinogen.  | Potential liver and kidney damage.  |
| 1,3-phenylenedi amine  | EPA Hazard list | Possible cancer link in early studies.  | -   |
| 2,4-dimethylaniline*   | EPA Hazard list | Possible cancer link in early studies.  | -   |

Note: Examples of wastes covered by the listing include wastewater treatment sludges, equipment cleaning sludges, filter cakes, dust collector fines, and still bottoms.

**Source : US EPA and published Chemical Toxicity Documentation**

Evidence

“Petroleum Hydrocarbons –

Range upto 570mg/kg” – Works Submission, Sandford Farm.

**vi) Documented use: Metal Industry Wastes**

The nearby engineering and metalwork industries are also likely sources of contaminants at the site, contaminants that include the following, many of which are linked to cancer, birth defects and other serious health conditions.

|                         |                                 |                              |
|-------------------------|---------------------------------|------------------------------|
| 1-Trichloroethane       | Copper                          | Molybdenum Trioxide          |
| 2-Dichlorobenzene       | Copper Compounds                | N-Butyl Alcohol              |
| 2-Ethoxyethanol         | Cumene                          | Naphthalene                  |
| 2-Methoxyethanol        | Cyanide Compounds               | Nickel                       |
| 2-Nitropropane          | Cyclohexane                     | Nickel Compounds             |
| 4-Isopropylidened       | Di(2-Ethylhexyl)                | Nitric Acid                  |
| 4-Trimethylbenzene      | Dichlorodifluoromethane         | O-Xylene                     |
| Acetone                 | Dichloromethane                 | P-Xylene                     |
| Adipate                 | Diethanolamine                  | Phenol                       |
| Aluminum (Fume Or Dust) | Diethyl Phthalate               | Phosphoric Acid              |
| Aluminum Oxide          | Dimethyl Phthalate              | Phosphorus (Yellow or White) |
| Ammonia                 | Ethyl Acrylate                  | Phthalate                    |
| Ammonium Nitrate        | Ethylbenzene                    | Phthalate                    |
| Ammonium Sulfate        | Ethylene Glycol                 | Polychlorinated              |
| Antimony                | Formaldehyde                    | Propane Sultone              |
| Antimony Compounds      | Freon                           | Propylene                    |
| Arsenic                 | Glycol Ethers                   | Sec-Butyl Alcohol            |
| Asbestos (Friable)      | Hydrochloric Acid               | Selenium                     |
| Barium                  | Hydrogen Fluoride               | Silver                       |
| Barium Compounds        | Isopropyl Alcohol               | Silver Compounds             |
| Benzene                 | Lead                            | Styrene                      |
| Biphenyls               | Lead Compounds                  | Sulfuric Acid                |
| Bis(2-Ethylhexyl)       | M-Xylene                        | Tetrachloroethylene          |
| Butyl Benzyl            | Manganese                       | Toluene                      |
| Cadmium                 | Manganese Compounds             | Toluenediisocyanate          |
| Cadmium Compounds       | Mercury                         | Trichloroethylene            |
| Chlorine                | Methanol                        | Trichlorofluoromethane       |
| Chromium                | Methyl Ethyl Ketone             | Xylene (Mixed Isomers)       |
| Chromium Compounds      | Methyl Isobutyl Keytone         | Zinc (Fume Or Dust)          |
| Cobalt                  | Methylenebis(Phenylis ocyanate) | Zinc Compounds               |
| Cobalt Compounds        |                                 |                              |

**Table: Typical Metals Waste By-products**

**vii) Other Wastes of Unknown Origin**

- **Synthetic adhesive wastes** - unclear origin (some sourced from Bracknell)
- **Ion exchange resin wastes** - Mostly of unclear origin (including metal hydroxide filter cakes)
- **Pharmaceuticals wastes** – (no details available)
- **Kiesleguhr & Ion-exchange wastes** (implying that they were used to manufacture some sort of unknown chemical process)
- **Tar, pitch, bitumen and asphalts**
- **Industrial effluent treatment sludge cake – unclear**
- **Interceptor pit wastes** – part of a manufacturing process (unclear)
- **Distillation residue** – (most likely complex hydrocarbons)
- **Food Processing wastes** - Less of a concern. (although radiological decontamination has been used in the food industry)

# Medical Evidence from Epidemiological Studies

Backing information for this section was supplied by and from studies by :-

- **Dr. Lade Jeremy** - Berkshire Healthcare NHS Foundation Trust – Information supplied via LVAG
- **Dr. Jeremy Rushton**, OBE. Principal Research Fellow, Dept. Epidemiology and Public Health

Firstly the following diagram demonstrates the potential paths of risks from a landfill waste site (which are greatly exacerbated by exposing the landfill site).

It is critical to note that this process (and the risks entailed) are common to any building or commercial landfill sites, and even apply to domestic landfill sites, due to the toxic nature of typically dumped waste chemicals.

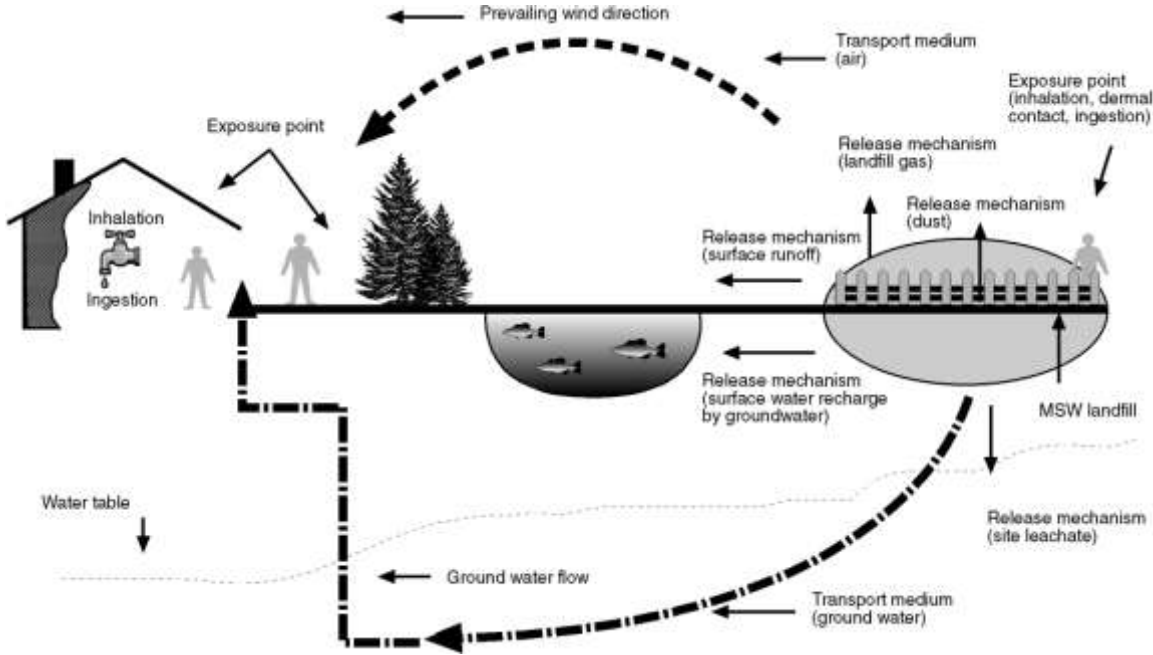
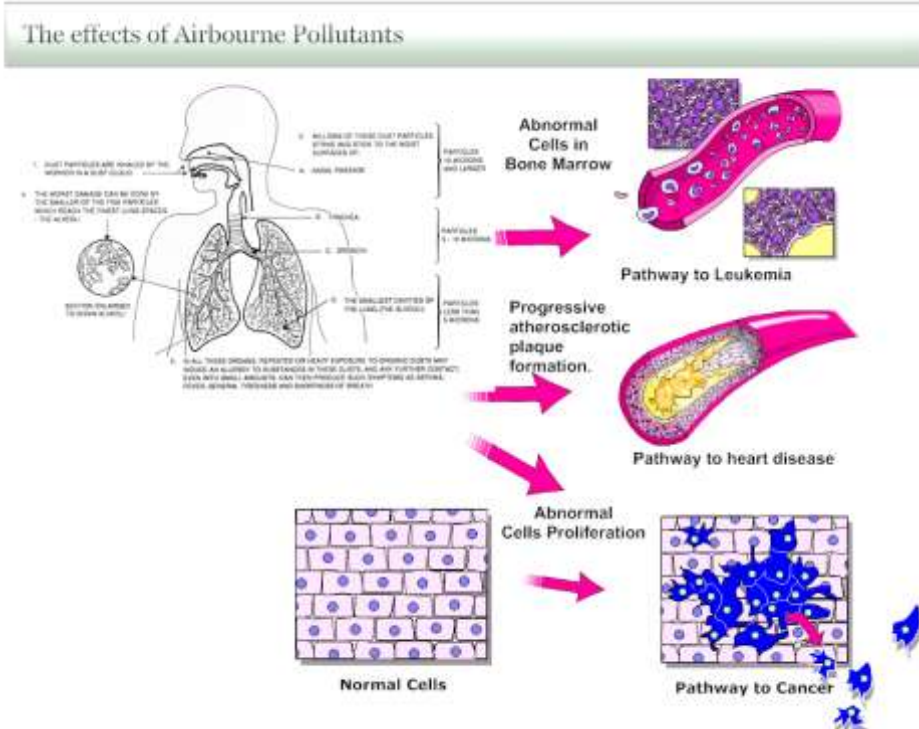


Diagram – Exposure Points from exposed waste-sites. (source: Lesley Rushton, Dept. Epidemiology and Public Health, Imperial College London)

The following diagram serves to illustrate the potential impact of airborne pollutants.



### **Government Legislative Background**

Firstly it is important to note that the UK Contaminated Land Strategy defined the human 'receptor' category of significant harm as:-

"Death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions." For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction or extensive skin ailments."

### **Research Study: Opening Landfill Sites – Risks of Congenital Anomalies**

As is highlighted in the report titled "Environmental Health: Risk of Congenital Anomalies after the Opening of Landfill Sites" there is a proven link between re-opening landfill sites causing a rise in congenital abnormalities from 0.87 to 1.21 – namely a 30-40% increase. Testing on later landfill sites from 2000 seemed to give lower results (aprox 5%).

*Source: "Environmental Health: Risk of Congenital Anomalies after the Opening of Landfill Sites"  
Published in Environmental Health Perspectives, Oct, 2005*

### **Research Study: Opening Landfill Sites – EUROHAZ-CON Study**

In addition "The EUROHAZ-CON study of hazardous waste landfill sites in five European countries found a 33% increase in the risk of congenital abnormalities in infants born to mothers living within 3 km of open landfill sites.

*Source: "Eurohaz-Con Study - Risk Of Congenital Anomaly In Relation To Residence Near Hazardous Waste Landfill Sites" – Published in The Lancet, 1998 Aug 8;352(9126):423-7.*

### **Research Study: Opening Landfill Sites – Investigation of Cancer Incidence near Landfills**

Additionally an often cited research report from New-York ("Investigation of Cancer Incidence and Residence Near 38 Landfills with Soil Gas Migration Conditions". New York State, 1980-1989) examined the cancer incidence from 38 key landfill sites in the New-York area – focussing specifically on those which exhibited significant landfill gasses, and were not treated (i.e. still exhibiting significant gasses, capped, vented or subject to high-temperature gas incineration). This study found a significant increase (four-fold) in bladder cancer and leukaemia in women.

More importantly this studies highlight that landfill gases should be monitored, and that sites should remain capped, and if required then high-temperature (i.e. >1000°C) gas incineration should be used

### **Research Study: EPA Investigation into Landfill Gasses**

Dr RCC Rowe (June 1989) cites the US EPA having completed a generic risk assessment of landfills without gas controls and found the risk to be in the range of 100-10,000 cases of cancer per million people exposed. Where gas control were in action the risk fell to 1-10 cases per million people exposed. (i.e. as near to the "background cancer risk" levels as to be practically indistinguishable from the base-line of ~150 per million).

This further emphasis that the site capping should remain in place, and that gas emissions monitoring and potentially high-temperature (>>1000°C) incineration should be used to minimise the production of Dioxins and Furfans.

*Source: RCC Rowe (B. Medicine and Surgery, Fellow of the Royal College of Pathologists) – Evidence Submitted, 1989*

### **Applying the research to the Sandford Farm Case**

Overlaying the above statistics on the map of the local community shows the following population overlay in the event of the re-opening of the Sandford Farm site. The coverage areas cover all of Woodley, Hurst and significant parts of Charvil, Twyford, Lower Early and Winnersh.

Additionally we have not factored in the prevailing wind-factor, which could lead to wastes being carried further afield and covering a much wider coverage area. This is highlighted in the following figures and diagrams, demonstrating the area of increased risk.

Sandford Farm – Submission of Evidence and Research

Potential Community Exposure Pathways from proposed treatment method

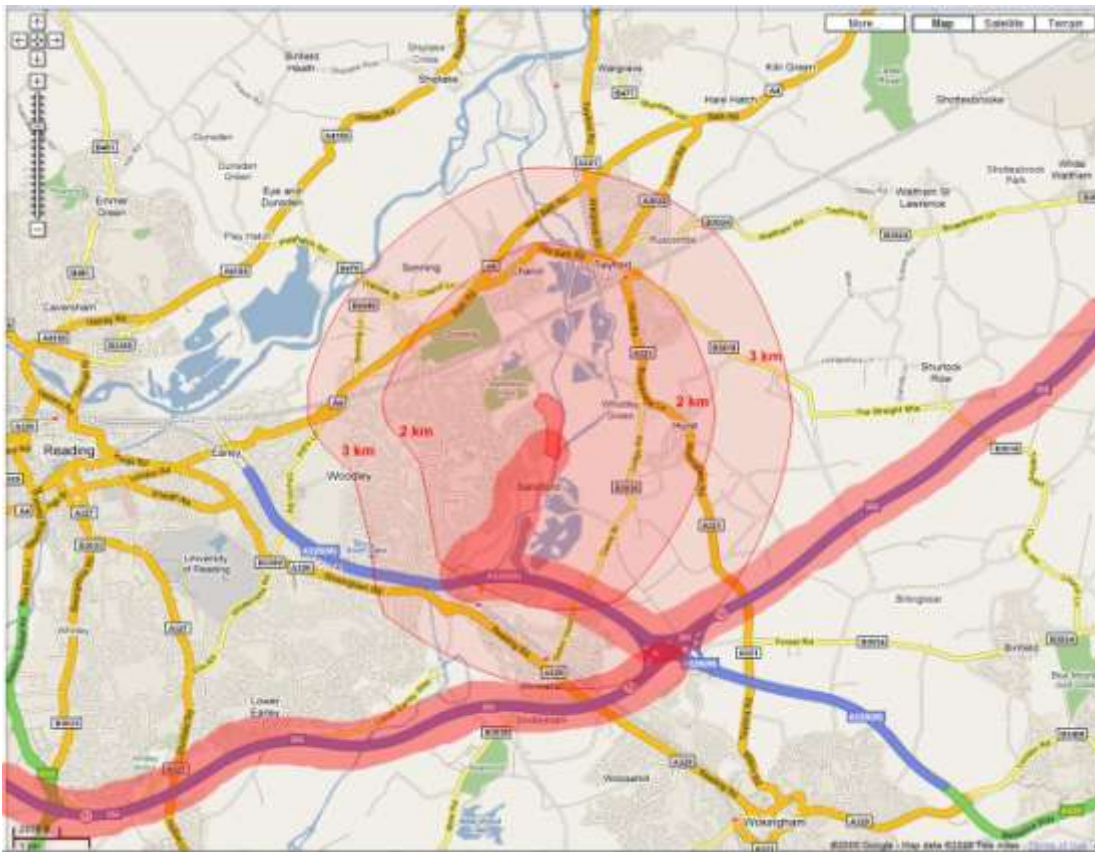
| Pathway Name  | Point of Exposure   | Exposure Route                            | Exposed Population              | Time of Exposure                            | Contaminants of concern  | Est Pop  |
|---|---|---|---------------------------------|---|--|----------|
| Waste washing from waste water treatment.                                   | Ground-water contamination from washing wastes.                         | Ingestion                                 | Local Water Supply (Large)      | Long-term                                   | Arsenic<br>VOCs  | Unknown  |
| Dust Exposure from soil mechanical treatment.                               | Landfill site and transport route for all carried wastes from the site. | Ingestion<br>Inhalation<br>(Skin Contact) | Surrounding population (~3km)   | V. High during and following site treatment | Asbestos (all forms)<br>VOCs   | Unknown  |
| Gas Exposure from uncovering the site.                                      | Landfill site and to a lesser extent transport route for wastes.        | Inhalation                                | Relatively close to site. (1km) | ~2 Years (during site treatment)            | Benzene<br>VOC, Airborne Dioxins, etc<br>Typical Analysis: "Analysis of gases revealed some 420 different compounds of which 12 were known to be carcinogenic" In France similar analysis revealed 300 compounds.<br>At Nant-y-Gwyddon (Rhondda) analysis revealed 117 organic compounds including toxic components. | Unknown  |
| Airborne exposure from burning or combustion of currently buried materials. | Any location down-wind of the combustion site/s.                        | Inhalation                                | Surrounding population (~3km)   | V. High during and following site treatment | See above.   | Unknown. |

Table: Environmental Exposure Pathways – Based on US Agency for Toxic Substance & Disease Registry

## Sandford Farm – Submission of Evidence and Research

### Overview of proposed Sandford Farm Waste site and local community.

(3km radius, as per research, where risk is significantly raised risk of cancer and birth defects to pregnant woman).



**Table: Potential Epidemiological Impact from re-opening Sandford Farm landfill site to open-air treatment.**

Additionally overlaying the same map on local nursery and primary schools (where pupils are likely to be at significantly increased risk due to their development age).

**Sandford Farm – Submission of Evidence and Research**

**Overview of proposed Sandford Farm Waste site re-opening and local nurseries, primary and secondary schools.**

(3km radius, as per research)



**Figure: Potential Epidemiological Impact from re-opening Sandford Farm landfill site to open-air treatment. Overlaid with local pre-school and primary schools (child development stage of greatest impact)**

## Reliability of Environmental Impact Statements

### Opinion of Independent Experts on Environmental Impact Statements

Rather than restate the research, it is more pragmatic to restate the published views of a leading researcher into this area, Professor Sharon Beder, who was consulted as part of this review.

“Environmental Impact Statements [analogous to the current submission] have lost credibility with environmental and resident groups over recent years because they **are being increasingly perceived as biased public relations documents.** [underlines added].

“This arises in part because the community generally expects that an EIS should be an objective scientific report whilst **many consultants and project proponents view an EIS as a supporting document prepared as part of the procedure for gaining approval for a project.**”

“...This is exacerbated by the circumstances of EIS preparation where large investments, careers and the viability of businesses are at stake. It is therefore inevitable that the values and goals of those preparing an EIS will shape its contents and conclusions through the way scientific data is collected, analysed, interpreted and presented.  
...”

“Because the EIS is done rather late in the planning process **the project proponents will almost certainly have committed considerable financial resources to a particular option at a particular site.** The EIS at this stage becomes another obstacle in a field of bureaucratic hurdles on the way to their end goal. **Naturally, they will want that document to emphasise the advantages of the project to the community and to down play the disadvantages.**”

“**Occasionally there are gross abuses of the EIS system by project proponents** who leave vital information out of an EIS or falsify results....**More often biases are subtle and arise from the many value judgements that are made at every stage of the preparation of an EIS.** Some examples are given below...”

Or to quote from the American Journal Law & Medicine., 1990 v16: 399

*“...Risks to public health are particularly difficult to quantify because of uncertainty about the relation between exposure to environmental contamination and disease. Risk assessment is the current scientific tool to present estimates of risk. The method has created controversy, however, when underlying assumptions and uncertainties are not clearly presented. **Critics caution that the methodology is vulnerable to bias.**”*

Similarly to quote the article ‘Road Developments in the UK: An Analysis of Ecological Assessment in Environmental Impact Statements Produced between 1993 and 1997’

*“However, while potential ecological impacts were discussed in all the EISs reviewed, many still failed to predict the full range of potential ecological impacts.”*

Due to the above concerns a complete and fully impartial environmental impact statement is highly difficult to achieve, (either by private industry or by government development agencies). Consequently this current submission’s conclusions are suspect, and its recommendations subject to considerable doubt.

In particular the oversights of lack of examination of any of the previous site documentation and neglect of examining any epidemiological or toxicological data relating to landfills is particularly worrying in view of the critical nature of this site plan.

Similarly the lack of documented and peer reviewed research about the site decontamination method’s safety in isolating all water-born, gaseous and soil contamination from the public is highly concerning, especially given the previously documented toxic contamination sources. This leaves open serious questions open about the health and safety of both opening the site itself, and the site remediation techniques employed and their suitability for such a large and contaminated commercial landfill site.

**Finally it should be noted that the current submissions do not even address the most basic areas of risk assessment, namely:-**

- Issue identification
- Hazard identification
- Evaluate all potential avenues of exposure assessment
- Risk characterisation

## Brief Examination of Proposed Site Amelioration Method

While surprisingly little detail on the treatment method proposed was available at time of writing this document, based on the information supplied in the document, the following simplified process can be approximated.

It is worth highlighting the following aspects of this proposed treatment methods:-

- a) Waste-extraction – Is performed in the open air, exposing the surrounding population to gaseous emissions, dust and airbourne particles – including asbestos, VOCs (Volatile Organic Hydrocarbons) and heavy metals.

The air-quality (let alone dangerous pollutants) is estimated even in the developer's report to be impacted to at least 30 metres, however RPS reports that "this is at odds with odor complaints off-site during trial pitting", and furthermore puts the risk of odour and dust generation as "moderate to high".

- b) "Visual sorting" of the waste products is initially performed, apparently enabling the developer to determine toxic waste material from non-toxic waste material – although how this critical process is performed is not made clear in the site documentation.
- c) "Water washing" is performed on the waste materials – aside from the obvious flow-on effects on ground water and the local aquifer, the key point to note is that water does not remove many of the toxic contaminants listed in this document.
- d) Furthermore the Reed-bed filtration system suggested for waste-water and leachate treatment is not suitable for the range of pollutants that are present, based on the waste records.

Reed-beds are used primarily to treat water or surridge type liquids, typically focusing on removing COD (Chemical Oxygen Demand), TOC (Total Organic Carbon) and Ammonia.

Furthermore these plants are also not highly efficient, especially at removing trace heavy metals, VOC (Volatile Organic Hydrocarbons), PBC, Dioxins/Furfans, Asbestos, etc.

Finally these plants do not operate well at low temperatures (<15°C), and even in the trial plant the following criticisms (which are key to the operation of **any** bed filtration system) were leveled by RPS :-

- i) The flow-rates used were a fraction of that of the operational plant (<1% actually), and as bed filtration systems decrease in efficiency dramatically with load, this makes any questionable (the scale of the pilot plant vs operational plant was not provided, which is key to determining this)
- ii) As expected, even at the low flow rates used the BOD, COD and Ammonia reduction were "limited".
- iii) Reed-bed filtration systems take 3m to 24m to reach peak operation!
- iv) Direct discharge to sewer is suggested as an alternative to reed-bed treatment (!).
- v) The Environment agency has not approved this discharge.

- e) The extraction and transport of toxic material transport presents an obvious airborne route for pollutants.
- f) The burning and venting to atmosphere of "wood and paper materials" represents a significant risk to the public, as these materials are certainly contaminated after this period of time with leachate and other materials. In addition it is known that the combustion of organic material in the presence of chlorine (which is documented to be present at the site) can lead to dioxin/furan formation.

*Source: US EPA*

- g) Noise : RPS noted that noise from the trial plant was higher than that estimated from the operational plant! As the operational plant would need to operate at approximately a x100 higher flow and production rate, this is somewhat difficult to envision how this could be the case...[sic].

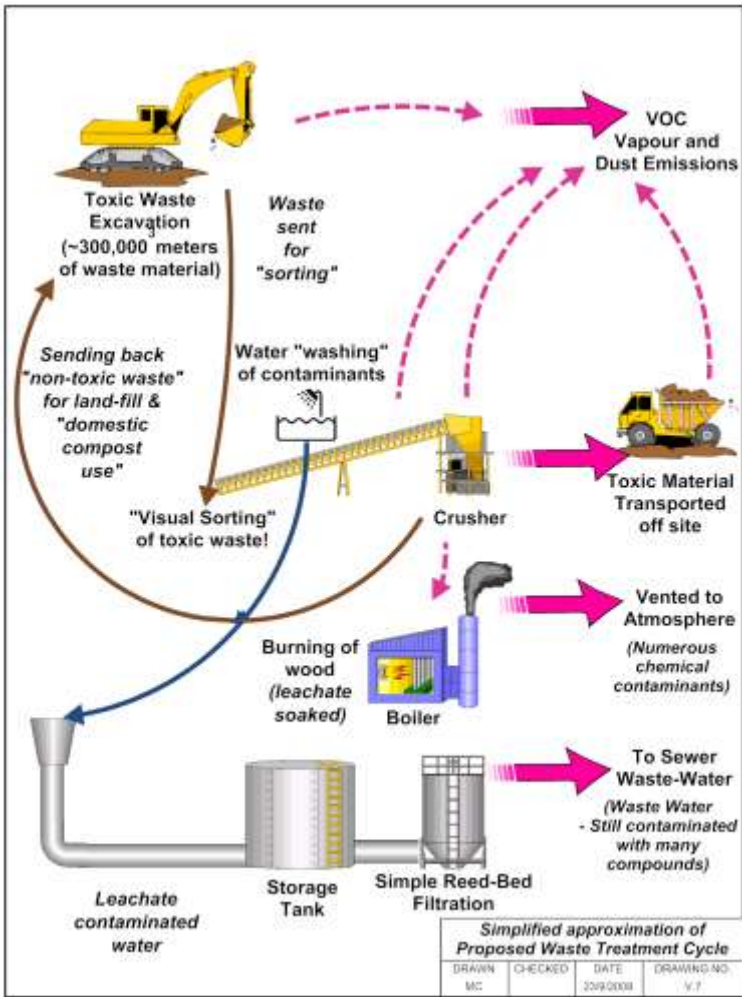


Figure – Approximation of proposed treatment cycle

**Side-note:** The current industry benchmark procedure for disposal of toxic contaminated wastes is ultra-high temperature Plasma arc waste disposal at a specialized facility, situated well away from residential areas. These modern forms of waste disposal while not ‘waste-free’, produce far fewer emissions than current traditional incineration methods – and more specifically far less airborne contamination in the form of pollutants and airborne particles; and do at least offer a better long-term solution to municipal waste.

Unfortunately the economics of waste disposal for developers are (based on US figures) \$35 per tonne for landfill disposal vs upto \$172 for plasma arc incineration (note that this figure is probably a significant over-estimate, as more modern techniques have far better energy efficiency). However the economic drivers for potential developer should be apparent. (i.e. Sandford Farm contains approximately 300,000 m<sup>3</sup>, assuming a density of 1000kg/m<sup>3</sup> → ~\$50M for landfill treatment alone!)

See:-

“Solid Waste Conversion: A review and database of current and emerging technologies. Final Report”  
University of California Davis. R. B. Williams, B. M. Jenkins, D. Nguyen

“Review of Environmental Statement for Planning Application O/2008/1282”  
RPS Group (Planning and Development), B. Wibberley

## Legal Concerns

### ***Pending Similar Litigations***

There are a number of current and pending litigations across the EU for state liability in toxic waste remediation. Perhaps most pertinent would be the Corby case vs Corby City council, where 24 children were born fingerless or with webbed hands (a highly rare birth defect under normal situations) during the council's approved chemical clean-up operation.

In reports already similar to Sandford Farm “recalled the air full of pungent fumes when council engineers began re-opening some of the estimated eight to 16 toxic pits scattered around Corby.”

To quote Des Collins, the solicitor running the case “We have now got medical reports that rule out alternative explanations for what caused the upper limb deformities in these children.”

Mr Collins has found statistical evidence that undermines a Northamptonshire Health Authority report four years ago which rejected the idea that the births amounted to a cluster of "congenital limb reduction defects" in and around Corby. Since the report was published, the families' lawyers have found other cases and exposed what they believe are serious flaws in the initial report. Mr Collins claims the health authority ignored the fact and this pattern was repeated 1990 and 1997 (the dates of the landfill cleanup).

### ***Expert Legal Opinion***

To paraphrase Collins Solicitors, a leading firm in Chemical Toxicity Litigation :-

1. The council has a duty of care, and that professional liability and negligence could apply if this was not exercised satisfactorily.
2. The council's stance of being able to transfer their potential liability onto a 3rd party in the event of any potentially foreseen health effects is not satisfactory; and if is apparent that the 3rd party lacks the track-record, capability, methods in place, then this is certainly open to legal challenge in the event of any health impacts.
3. Similarly if it can be shown that the extraction could not either be done safely, or should not have been done initially from a risk perspective, then the same liability could arise.
4. He also noted that the public (or the council) conducting legal proceedings involving a developer that has its legal entity based in an off-shore company vehicle is -highly- problematic, as opposed to those involving well established on-shore businesses.

Note: Records research by Loddon Valley Action group in August' 2008 indicate that is likely the case with the applicant developers of Sandford Farm, as according to company records researched by LVAG:-

- |   |  |
|---|--|
| a) Sandford Farm Properties Ltd (Landowners)      | Registered in Jersey, <i>Channel Islands</i><br>Reg. Address POBox 1075, Elizabeth House, St. Hellier (a Trust Company address). |
| b) Woodley Developments Ltd. (Planning Applicant) | Company not registered in either UK or Jersey<br>Contact address given as POBox 1075 Elizabeth House, St. Hellier, Jersey        |
| c) Sandford Farm Properties Ltd.                  | Shareholders include companies based in Switzerland,<br>British.Virgin Islands and the Channel Islands                           |

### ***Expert Conclusions***

It is perhaps pertinent to note in relation to the Sandford case that in the Corby case the conclusion of the various leading medical, toxicological and land decontamination experts commissioned in this case had essentially been that :-

- a. Such a landfill site should *not* have been located in a residential setting in the first place.
- b. On the balance of risks *the least worst option would certainly have been to leave the wastes in situ.*
- c. Failing that, the mandating of a highly safe and fully contained complete extraction (and transportation – which was allegedly the source of many of the contaminants) should have been mandated.  
(In this case an allegedly inadequate treatment program was used, leading to several unexplained clusters of rare birth defects in the area).

Similarly opinion from Wayne Ingham (of Wesa Consulting– an environmental consulting and site reclamation company that has performed work on UK sites) was that ex landfill sites ***should not be used for domestic dwellings***; indeed that usage would probably be counter to Canadian regulations due to health risks.

## **State liability**

The House of Lords' decision that "the House of Lords considered whether a local authority, exercising supervisory duties under the Public Health Act 1936 and the relevant building bye-law regulations liability arose was confined to pure economic loss. The question whether there could be liability in similar circumstances for persons who suffered injury to person or health or damage to property was left open specifically."

*...Lord Hoffmann's ...recognises the possibility that where there is general reliance on what a "public authority was supposed to do. Powers of inspection for defects clearly fall within this category" that might give rise to a duty of care. "Comparatively little extra may be needed to found a common law duty of care owed to a particular person or class of persons". In general it appears that Inspectors who provided a certificate of fitness under a regulatory regime owed a common law duty of care. And similarly "a local planning authority which permitted or required the construction of [a foreseeably dangerous footpath] were held to have assumed responsibility to those, including the claimant, who might wish to use the footpath to see that it was not open until the danger was removed."*

### **Potential Constituent Elements of Misfeasance in Public Office – Tort Law**

"when a public officer acts in the knowledge that he thereby exceeds his powers and that this act would probably injure the claimant."

As a result of the recent decisions, it is possible to identify a series of elements which a claimant must show to bring a successful claim based upon misfeasance in public office. It must be shown that the defendant is a public officer, and that the claim relates to the defendant's exercise of power as a public officer.

## Relevant UK legislation and regulations

The following UK legislation requires detailed consideration before any further actions are taken:-

The following UK legislation and the extensive Industry Guidelines (a sample of which are mentioned below) require detailed consideration before any further actions are taken:-

1. Source: Wokingham Borough Council Contaminated Land Strategy (C.L.S.)

'1.2.1. Legislative background. In 1994 the Department of the Environment published a consultation document "Paying for our Past" which called for a review of the way in which contaminated land was dealt with so that land be treated to deal with unacceptable risk to health, safety or the environment for its current or intended use.'

On the 1<sup>st</sup> April 2000 the new statutory regime for Local Authorities related to contaminated land came into force under the *Environmental Protection Act (EPA) 1990 Part IIA* (as inserted by the *Environment Act 1995*). The *Contaminated Land (England) Regulations 2000*, and the *Department of Environment Transport and the Regions (DETR) circular )2/2000* with its attached statutory guidance...'

**Note** : Wokingham B/C's Contaminated Land Strategy states:

'The Council's priorities in dealing with contaminated land will be:

- a. To protect human Health
- b. To protect controlled waters
- c. To protect designated ecosystems
- d. To prevent damage to property
- e. To prevent any further contamination of land
- f. To encourage voluntary remediation
- g. To encourage re-use of brownfield land'

2.. Environmental Health Assessment - Contaminated Land should be considered when:-

a) "The proposed development site has been used in the past for a potentially contaminating use."

b)"The proposed development site is located adjacent to or nearby to other contaminated sites including landfill sites" (i.e. Ashenbury Park & Woodley Airfield).

3.. CIRIA (Construction Industry Research and Information Association ) Special Publication 1978 "In very general terms buildings should not be located on or adjacent to sites producing significant amounts of methane or CO2 or containing significant quantities of putrescible material."

*Note: Sandford farm contains critical levels of Methane.*

4. RICS (Royal Institution of Chartered Surveyors ) - Position Statement 2007 - "It is essential to steer development towards areas with the lowest flooding risk as houses built on flood plains are susceptible to damage and building in the wrong place such as on a flood plain or on runoff areas can increase the area of land adversely affected by flooding".

*Note: Large parts of Sandford farm site are under the flood plain.*

5. Government Planning Policy on development and flood risk (Planning Policy Statement 25)

## Recommended System of Works – Method Statements

Given the documented uses of the site and wastes stored on site the following *minimum* required site requirements should be mandated for any site planning purposes. It should be noted that with likely profits well in excess of £100M at 2008 house prices the current short cuts in remediation are not acceptable, nor financially appropriate given the scope of this development. :-

### 1. Mandating full hermetic site sealing before and during site processing.

To prevent highly risky air and ground-water contamination the entire site should be completely hermetic sealed prior to, during and after decontamination procedures; including negative pressure sealed waste processing, air-filtering and air-scrubbing for air decontaminants to ensure that toxic buried waste materials are not released into the environment.

Additionally ground-fixing techniques (to prevent contaminated soil becoming airborne), while practical in theory for short to medium term use, are unlikely to have been proven for long-term use; hence the following requirement for full site decontamination.

### 2. Mandating complete waste removal

Full and complete removal of all site waste materials should be performed before any development takes place, to ensure that the exposed wastes pose no future health risk to the community.. This should be mandated as a requirement due to the non-uniform and potentially highly carcinogen nature of the wastes present.

The current site technique involves mechanical material filtering of the wastes, and water based filtration. Given the toxic nature of the site, approving this method for site 'decontamination' would be wholly inadequate and its use negligent on such toxic materials – which are not removed in any way either by water washing or mechanical filtration techniques.

In fact adding water will potentially make the waste even more dangerous to the environment. (In the Planning Inspector's Public Inquiry Report (August 1999) rejecting an Appeal of previous housing application no. 98/64082/0 (on this site) states: 'Dewatering the waste is a prerequisite for the subsequent extraction and transfer of the waste in a suitable form, while avoiding undue risks of surface and groundwater contamination by leachate. It is fundamental to the success of the waste removal exercise and necessary to comply with a raft of development plan policies.....').

### 3. Mandating complete air and water tight waste removal.

As outlined in this document, the site contaminants when the site is re-opened represent a significant and ongoing risk to the public during their transport, and the requirement for a –completely- air-tight waste removal, storage and transport system should be mandated in this planning application. The proposed method would involve the temporary construction of an air-tight container over any site excavation.

Additionally a temporary construction road should be built to take site sealed waste traffic to the Winnersh roundabout, rather than trafficking the more public Woodley Roads. All site vehicle should be washed (including wheel-bases) to ensure contamination does not escape from the site.

### 4. Mandating air and water tight transportation of waste materials

Similarly *all* transportation of materials must be completely air and water-tight, to ensure there is minimal local contamination during the decontamination process.

### 5. Mandating off-site use of vitrification as a Safe toxic soil decontamination method

As highlighted above the method outlined in the site documentation has not been tested with this range of toxic wastes, will not remove the toxic contaminants, hence exposing the public to significant airborne based risks during the soil extraction, treatment and post-treatment phase. As such it represents an unacceptable risk to the public and the use of a comprehensive toxic soil decontamination mechanism should be mandated.

High temperature incineration, while wholly unsuitable for use in a residential area (the *minimum* safe distance is 2km for such a procedure) is the recommended long-term treatment method for wastes containing the contaminants listed in the waste approval documentation.

The use of a soil decontamination procedure that is suitable for the toxic wastes stored at the site would be batch vitrification processes for contaminated site remediation and waste treatment has been successfully used to treat a wide range of contaminated wastes and debris including: mixed transuranic wastes; polychlorinated biphenyls; pesticides; dioxins; and a range of heavy metals; such as are documented in the EPA documents.

### 6. Mandating regular on-site 3<sup>rd</sup> party government monitoring

### **Sandford Farm – Submission of Evidence and Research**

Due to the safety risks and potential industrial costs involved, *permanent* on-site monitoring should be mandated, with regular full site inspections performed, and immediate penalties for rule violation severe. It is probable that on a site development worth an estimated UKP 100-150M profit the commercial impacts would need to be severe to have any meaningful impact on industrial behaviour.

### **7. Mandating permanent on-site health monitoring**

Longitudinal monitoring and analysis of all neighbouring residents for long-term health impacts by an independent 3<sup>rd</sup> party medical research group should be performed on the surrounding area to the re-exposed wastes and their transport link.

### **8. Landfill Gas Emissions**

As per standard practice all landfill gasses should be subject to high-temperature (1,050°C – 1,250°C combustion), due to the nature of the carried VOC (Volatile Organic Hydrocarbons) that are carried in both domestic and industrial landfill waste-gasses. This procedure should be mandated by the site's current owners, and indeed it is highly questionable why it is not currently carried out, as per TA-Luft standard and UK Guidelines.

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## Conclusion

In summary this development represents the worst kind of development possible for the area due to the health risks involved in uncovering, excavating and inadequately treating and exposing wastes on site.

Any major construction processes is guaranteed to disturb buried soil and waste particulates, leading to a serious safety hazard. This development offers little to no positive impact on the community, **while presenting a highly dangerous development for this residential area.**

This development represents the worst possible development option for the local community, and presents an ongoing and continued health and safety threat to the local community through its additional exposure to toxic substances during and after the estimated 2 year excavation process; with the resultant increase in risk of cancers and birth defects to the surrounding population.

In particular the health risks of longitudinal birth defects, child development and cancer in the community from uncovering this waste site are likely to be significant and long-term.

In amelioration this site offers the community little if any positive contributions – it does not contribute to medical or community faculties of the already over-stretched community facilities.

In conclusion I would recommend that Wokingham Borough council reject this application in its entirety summararily, and explicitly re-zone the waste-tip and surrounding area as contaminated green-land, and be permanently removed from the housing development zoning.

Failing this then the strictest site conditions (see previous section) must be applied to the site, with a binding covenant with strict penalty clauses (up to and including full forfeiture of the developers bond and halting of site works; and site restoration at the developers expense).

It should be noted that in the region there are several areas that have been listed in the current local plan as potential housing development sites.

Yours truly,

Mark Comeadow (Bachelor of Chemical Engineering)

## Appendices

### ***Appendix 1A - Increased Heavy Traffic Levels linked to higher road-traffic fatalities [relating to Data-Centre and Warehouse usage]***



Stripping back the reality of increased development, commercial and ware-house the reality is that any larger vehicles lead to higher road fatalities – such as would be required for this development and to service the required warehousing and light-office facilities.

Research from Australian, US and EU road transport data shows a far higher likelihood of death from an accident involving a LGV or HGV in collision with another vehicle. This is due to the greatly increased mass ratios of vehicles, highly truck rigid body design [lacking crumple zones] and high truck clearance that results over-riding the safety systems of cars [that are all located closer to the road]; all resulting in far more fatal injuries.

Similarly the pedestrian visibility and stopping distances of these types of vehicles is significantly worse than normal vehicles (aside from the highly fatal nature of a truck-pedestrian accidents).

The conclusion of this research is that these types of vehicles represent a highly fatal accident risk to the local community, and can be perhaps more dramatically represented above.

## **Appendix 1B – Traffic Accident Research Data**

### **UK Truck Safety References**

The Road Safety Research Report Daft August 2005 Highlights that:-

- \* HGV/LGVs are responsible for more fatalities than any other work vehicle type regardless of blame.
- \* In particular on rural A roads and motorways, reasons = poor observation, close following, fatigue, load problems, vehicle defects & time constraints.
- \* A quarter of fatalities are caused by LGV/HGV drivers breaking the speed limit.

### **UK Accent Death Statistics**

[http://www.dft.gov.uk/stellent/groups/dft\\_transstats/documents/page/dft\\_transstats\\_612589.xls](http://www.dft.gov.uk/stellent/groups/dft_transstats/documents/page/dft_transstats_612589.xls)  
- Tab 10

### **UK Total Road Users**

[http://www.dft.gov.uk/stellent/groups/dft\\_transstats/documents/page/dft\\_transstats\\_041505.pdf](http://www.dft.gov.uk/stellent/groups/dft_transstats/documents/page/dft_transstats_041505.pdf)  
- Chapter 9, Page 7 (Page 155)

From contact with UK authorities there has been no equivalent research done in the UK that analyses in detail road-accident statistics to the level of the international reports cited below.

### **International Truck Safety Comparison**

Australia: In Victoria [Australia] 30% of car occupants who are killed or seriously injured in multi-vehicle collisions are involved with collisions with trucks"...In particular articulated vehicles are 14 times more likely to be involved with a fatal crash than a car, and 2.3 times greater for car only crashes.

USA Vehicles > 12t make up less than 2% of the vehicle fleet, but contribute to 9% of fatalities.  
Europe estimate of all road deaths involve trucks about 25% involve trucks.

### **EU Truck Safety References**

#### **EU Traffic-Safety**

EU traffic accidents and the impact of trucks "Some 60% of persons killed in traffic accidents in the EU (40,000 fatalities per year) are car occupants. The dominant cause of these accidents, and one that makes the consequences even worse, is the lack of car/car and car/HGV compatibility."

### **Germany Truck Safety References**

Germany: For multi-vehicle crashes 31% of fatalities involve a heavy vehicle.

German Traffic Accidents –German Insurance Association (see section titled "Safety of Commercial Vehicles – p.12+)

<http://www.gdv.de/Downloads/Jahrbuch/SV-Bericht2003englisch.pdf#search=%22%2BHGV%20%2Baccident%20%2Bsurvival%20%2Brate%22>

**Sandford Farm – Submission of Evidence and Research**  
**Australian Truck Safety References**

Department of Transport & Communications

- Australia is one of the world-leading countries in research into traffic accidents, and Monash University researchers have completed an excellent Meta-Analysis of statistics & accident deaths in conjunction with VicRoads [traffic-safety]. "In Europe truck crashes makes an estimated 25% (13,000 fatalities per annum) of all road deaths. In these multi-vehicle accidents most at risk are the road-user, not the truck occupants."

Federal Office of Road Safety, Australia

<http://www.monash.edu.au/muarc/reports/atsb092.pdf>

Australian Computer Modelling of Heavy Vehicle Accidents

<http://www.monash.edu.au/muarc/reports/muarc112.html>

Truck Involved Crash Study

<http://www.monash.edu.au/muarc/reports/muarc035.pdf>

<http://www.monash.edu.au/muarc/reports/muarc035.pdf>

**Key extracts from the reports:-**

1/3rd of truck accidents result in fatalities (as opposed to hospital admissions) as opposed to 1/10th of car accidents result in fatalities (as opposed to hospital admissions)  
i.e. Truck-car accidents result are over x3 as fatal as car accidents.

Note: This does not account for minor accidents that resulted in no hospital admission or fatalities at all - which are of course far more likely to be due to car accidents - thus the results are probably actually *under-estimating* the scale of the difference.

**Other related statistics were that:-**

Excess truck speed was involved 25% of the time.

Truck driver inattention 16% of the time, and asleep at the wheel was involved 15% of the time.

**USA Truck Safety References**

US Roads Management & Engineering Journal

<http://www.usroads.com/journals/rmej/0006/rm000603.htm>

[http://www.usroads.com/journals/rmej/0006/trucks\\_tables.htm#1](http://www.usroads.com/journals/rmej/0006/trucks_tables.htm#1)  
[http://www.usroads.com/journals/rmej/0006/trucks\\_tables.htm#3](http://www.usroads.com/journals/rmej/0006/trucks_tables.htm#3)

"Large truck occupant deaths number about 700 annually, but about 4,000 occupants of passenger vehicles die each year in collisions with large trucks. This amounts to more than one-fifth of all passenger vehicle occupant deaths in multiple-vehicle crashes."

## Appendix 2A – Land Contamination References

### Key Articles on the risks of Open Landfills

1. “Risk of Congenital Anomalies after the Opening of Landfill Sites”  
Journal: *Environ Health Perspect.* 2005 October; 113(10): 1362–1365.  
*Stephen R. Palmer, Frank D.J. Dunstan, Hilary Fielder, David L. Fone, Gary Higgs, and Martyn L. Senior*  
*Department of Epidemiology, Statistics and Public Health, Wales College of Medicine, Cardiff, Wales.*  
*GIS Research Centre, School of Computing, University of Glamorgan, Pontypridd, Wales*  
*Department of City and Regional Planning, Cardiff University, Cardiff, Wales*
2. “Risk of adverse birth outcomes in populations living near landfill sites.”  
*British Medical Journal*, 2001 August 18; 323(7309): 363–368  
*Paul Elliott, director, David Briggs, professor of environment and health, Sara Morris, research associate, Cornelis de Hoogh, research associate, Christopher Hurt, research associate, Tina Kold Jensen, lecturer, Ian Maitland, database manager, Sylvia Richardson, professor of statistics, Jon Wakefield, reader in statistics, and Lars Jarup, assistant director.*  
*Small Area Health Statistics Unit (SAHSU), Department of Epidemiology and Public Health, Imperial College.*
3. “Hazardous Waste Sites and Effects on Health.”  
Dr D Van Steenis MBBS. 2nd July 1999.
4. “Comments on Landfill Gas and Plantlife.”  
Professor R.J. Summerfield. (BSc, PhD, DSc, CBoil, FIBoil). Nov, 1990
5. “Investigation of Cancer Incidence near 38 Landfills with Soil Gas Migration Conditions :New York State, 1980-1989.” July 1989  
State of New York, Department of Health. Centre for Environmental Health
6. “Evidence provided by Dr Rowe.” [to earlier submission], 1989  
*Dr. Rowe (B. Medicine and Surgery, Fellow of the Royal College of Pathologists) – Evidence Submitted, 1989*
7. “Toxic Chemical Releases.” F.J. Steinbrenner, 1989 (Georgia)
8. “Solid Waste Conversion: A review and database of current and emerging technologies. Final Report”  
University of California Davis. R. B. Williams, B. M. Jenkins, D. Nguyen

### Key Articles on the risks of Airborne Pollution

1. “The Effect of Air Pollution on Lung Development from 10 to 18 Years of Age”  
*New England Journal of Medicine*, 9<sup>th</sup> September, 2004, Vol 351, No. 11  
*W. James Gauderman, Ph.D., Edward Avol, M.S., Frank Gilliland, M.D., Ph.D., Hita Vora, M.S., Duncan Thomas, Ph.D., Kiros Berhane, Ph.D., Rob McConnell, M.D., Nino Kuenzli, M.D., Fred Lurmann, M.S., Edward Rappaport, M.S., Helene Margolis, Ph.D., David Bates, M.D., and John Peters, M.D.*
2. “An Association between Air Pollution and Mortality in Six U.S. Cities”  
*New England Journal of Medicine*, Volume 329:1753-1759, December 9, 1993, No. 24  
*Douglas W. Dockery, C. Arden Pope, Xiping Xu, John D. Spengler, James H. Ware, Martha E. Fay, Benjamin G. Ferris, and Frank E. Speizer*

### Official Documents

1. Various cuttings relating to the Corby Toxic Site remediation court-case, currently underway in the UK courts.
2. “RSK Group – Assessment and Remediation Strategy”, 2008
3. Report on the Available Data and Identification and Assessment of Medium to Long-term Options on Sandford Farm Planning Application.”  
Report by RPS Technology for Wokingham Borough Council, November 1996
4. “Review of Environmental Statement for Planning Application O/2008/1282”  
RPS Group (Planning and Development), B. Wibberley

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### Other articles

Environmental Exposure Pathways – US Agency for Toxic Substance & Disease Registry  
[http://www.atsdr.cdc.gov/HAC/PHA/pfohl/pfo\\_p4b.html](http://www.atsdr.cdc.gov/HAC/PHA/pfohl/pfo_p4b.html)

Environmental Health: Risk of Congenital Anomalies after the Opening of Landfill Sites  
<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1281280#b9-ehp0113-001362>

Personal Exposure Meets Risk Assessment: A Comparison of Measured and Modeled Exposures and Risks in an Urban Community  
<http://www.ehponline.org/docs/2003/6496/abstract.html>

British Medical Journal: Risk of adverse birth outcomes in populations living near landfill sites  
<http://bmj.bmjournals.com/cgi/content/full/323/7308/DC1/1>

Sandford Farm, Woodley – Environmental Statement – June, 2007  
<http://www.wokingham.gov.uk>

US – Analysis of a previous tannery waste site  
[http://yosemite.epa.gov/r1/npl\\_pad.nsf/701b6886f189ceae85256bd20014e93d/b22fd7cd45f6905185256b4200604f9b!OpenDocument#top](http://yosemite.epa.gov/r1/npl_pad.nsf/701b6886f189ceae85256bd20014e93d/b22fd7cd45f6905185256b4200604f9b!OpenDocument#top)

West Berkshire District Council - Contaminated Land Strategy (2<sup>nd</sup> revision)  
<http://www.westberks.gov.uk/CHttpHandler.ashx?id=7372&p=0>

## **Appendix 2B – Chemical Toxicity References**

Royal Commission on Environmental Pollution (24<sup>th</sup> report)

<http://www.rcep.org.uk/chreport.htm>

Paint Industry Production Wastes – EPA Overview

<http://www.epa.gov/reg3hscd/bfs/regional/industry/paint.htm>

Furniture/Wood Manufacturing and Refinishing Wastes – EPA Overview

<http://www.epa.state.oh.us/ocapp/sb/refinish.html>

Dyes and Pigments Production Wastes – EPA Overview

<http://www.epa.gov/epaoswer/hazwaste/id/dyes/index.htm>

Metal Production Wastes – EPA Overview

<http://www.epa.state.oh.us/ocapp/sb/metalmfg.html>

Birth Defects : Scientific References

<http://www.protectingourhealth.org/newscience/birthdefects/birthdefectsreferences.htm>

Low level exposure to asbestos: is there a cancer risk? Br J Ind Med. 1988 August; 45(8): 505–508.

<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1009642>

Toluene at environmentally relevant low levels disrupts differentiation of astrocyte precursor cells

<http://cat.inist.fr/?aModele=afficheN&cpsid=14454222>

Developmental Toxicity of Prenatal Exposure to Toluene (AAPS Journal. 2006)

<http://www.aapsj.org/view.asp?art=aapsj080249>

Benzene toxicity and risk assessment, 1972-1992: implications for future regulation. Environ Health Perspect, V110

<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1520014>

Chronic chromium exposure-induced changes in testicular histoarchitecture are associated with oxidative stress: study in a non-human primate

<http://humrep.oxfordjournals.org/cgi/content/full/20/10/2801>

US Agency for Toxic Substances and Disease Registry

<http://www.atsdr.cdc.gov/about.html>

Environmental Chemistry

<http://environmentalchemistry.com/>

US Environmental Agency - Technology Transfer Network

[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

US Environmental Agency – Health Effects of Hazardous Air Pollutants

<http://www.epa.gov/ttn/atw/hlthef/hapindex.html>

US Environmental Agency - Persistent Bioaccumulative and Toxic (PBT) Chemical Program

<http://www.epa.gov/opptintr/pbt/>

US Department of Health and Human Services: National Toxicity Program – Report on Carcinogens – 11<sup>th</sup> Ed.

<http://ntp.niehs.nih.gov>

US Department of Health and Human Services: Agency for Toxic Substances and Disease Registry

<http://www.atsdr.cdc.gov/toxfaq.html>

US Environmental Protection Agency : Health Effects Notebook for Hazardous Air Pollutants

<http://www.epa.gov/ttn/atw/hlthef/hapindex.html>

Consolidated European Waste Catalogue - Wastes and Potential Hazards – Appendix A & B

<http://www.environment-agency.gov.uk/business/1745440/444663/landfill/1764524/1693182/355572/?lang=e>

## **Appendix 2C - Public health Investigations and Environmental Impact Statements**

Environmental Protection Agency - Saco Tannery Waste Pits – 5 Year Review - 12/19/2003

<http://www.epa.gov/superfund/sites/fiveyear/f04-01002.pdf>

Public Health Investigations at the Nant-y-Gwyddon Landfill Site, Rhondda Cynon Taf, Wales:

An Evaluation of the Environmental Health Assessment Process

<http://www.wales.nhs.uk/sites/documents/369/ATSDRfinalenglish.pdf>

Bias and Credibility in Environmental Impact Assessment - Professor Sharon Beder

<http://homepage.mac.com/herinst/sbeder/EIS.html>

Sitting a Hazardous Waste Facility: The Tangled Web of Risk Communication - Sharon Beder and Michael Shortland

<http://homepage.mac.com/herinst/sbeder/risk.html>

Hazardous Waste: An Intractable Problem - Sharon Beder

<http://homepage.mac.com/herinst/sbeder/risk.html>

Second Five-Year Review Report – Tannery Waste Pits

<http://www.epa.gov/superfund/sites/fiveyear/f04-01002.pdf>

Road Developments in the UK: An Analysis of Ecological Assessment in Environmental Impact Statements Produced between 1993 and 1997

<http://www.ingentaconnect.com/content/routledg/cjep/2000/00000043/00000001/art00004>

Educated Guesses – Health Risk Assessment in Environmental Impact Statements; Am. J. L. & Med., 1990 v16: 399

<http://www.ncbi.nlm.nih.gov/pubmed/2278245>

A Background Report for the International Study of the Effectiveness of Environmental Assessment

<http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/health-perspective-sante/index-eng.php>

### ***Appendix 3 – Further Air Pollution References***

Research in the United States and Canada has shown that diesel particulates (i.e. diesel fuel emissions, particularly from heavy vehicles, and vehicles using low-grade fuels, as is the case in heavy construction) are linked to lung Cancers.

#### **Canadian Government Research**

*[http://www.oehha.ca.gov/air/diesel\\_exhaust/crumpcoms.html](http://www.oehha.ca.gov/air/diesel_exhaust/crumpcoms.html)*

#### **Californian Government**

Also Diesel emissions are currently undergoing analysis by the Californian Government to be reclassify Diesel Particulate Emissions as a Toxic Air Contaminant.

*<http://www.arb.ca.gov/regact/diesltac/diesltac.htm>*

## **Appendix 4 – Legal References**

From *Francovich* to *Köbler* and beyond: The evolution of a State liability regime for the European Community - Evangelos Nikolaou

(See Sections Authorities Involving Claims against Regulatory Authorities Claims Environmental Health Inspectors)

<http://ethesis.helsinki.fi/julkaisut/oik/julki/pg/nikolaou/fromfran.pdf>

Who Regulates the Regulators? Liability of Regulators in Tort Claims

Elizabeth-Anne Gumbel QC and Duncan Fairgrieve

[http://www.1cor.com/1155/records/1084/Who%20Regulates%20the%20Regulators%20Paper%20\(EG%20-%20DF\)%20\(2\).pdf](http://www.1cor.com/1155/records/1084/Who%20Regulates%20the%20Regulators%20Paper%20(EG%20-%20DF)%20(2).pdf)

Families blame toxic dumps for deformities – The Independent, 26<sup>th</sup> April, 2004

Quoted in <http://savesouthbeach.com/corby.html>