

# Porthmellon Waste Management Site

Addendum Asbestos Assessment and

Asbestos Protocol

SLR Ref: 416.03263.00003  
Version No: Rev0  
August 2015

## CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Terms of Reference .....	1
1.2	Background.....	1
1.3	Report Purpose.....	2
1.4	Report Structure .....	3
<b>2.0</b>	<b>SUMMARY OF 2013 ASBESTOS SITE INVESTIGATION .....</b>	<b>4</b>
2.1	Introduction.....	4
2.2	Rationale .....	4
2.3	Investigation Scope of Works.....	4
2.4	Site Inspection .....	4
2.5	Trial Pits .....	4
2.6	Hand Excavated Pits.....	5
2.7	Waste Sampling and Laboratory Analysis .....	5
2.8	Asbestos Observations.....	5
2.9	Asbestos Analysis .....	6
<b>3.0</b>	<b>ASBESTOS RISK ASSESSMENT AND WASTE CLASSIFICATION.....</b>	<b>10</b>
3.1	Introduction.....	10
3.2	Site Visit August 2015 .....	10
3.3	Asbestos Human Health Risks .....	15
3.4	Asbestos Contamination Legislation .....	16
3.5	Interpretation of Asbestos Results at Porthmellon .....	19
3.6	Short Term Risks during Construction .....	20
3.7	Longer Term Risks to the Development.....	21
3.8	Waste Disposal .....	21
3.9	Summary .....	22
<b>4.0</b>	<b>SUGGESTED ASBESTOS PROTOCOL .....</b>	<b>23</b>
4.1	Background.....	23
4.2	Purpose of Document.....	23
4.3	Legislation and Limits of Responsibility.....	24
4.4	Protocol for the Identification and Management of Asbestos Risk.....	28
<b>5.0</b>	<b>CLOSURE.....</b>	<b>35</b>

## TABLES

Table 1 – Asbestos Screen Results .....	8
Table 2 – Asbestos Quantification Results .....	9
Table 3 - Managing Asbestos Risk on Site – Legal Duties.....	25
Table 4 - Control of Asbestos Regulations – Client Compliance.....	26

## APPENDICES

<b>Appendix A</b>	<b>Waste Material Reuse Feasibility Study and Risk Assessment 2013</b>
<b>Appendix B</b>	<b>2013 Laboratory Analysis</b>
<b>Appendix C</b>	<b>Asbestos Air Monitoring Results</b>

## DRAWINGS

<b>Drawing 1</b>	<b>Location of Asbestos Containing Materials</b>
<b>Drawing 2</b>	<b>Trial Pit Location Plan</b>

## **1.0 INTRODUCTION**

### **1.1 Terms of Reference**

This report concerns the Porthmellon Waste Management Site, St Mary's, Isles of Scilly. The report provides an update of a site investigation undertaken in April 2013 in terms of the presence of asbestos containing materials (ACMs) and presents a proposed Protocol for the management of ACMs during the future management of Legacy Wastes currently stockpiled at the site.

The assessment has been carried out by SLR Consulting Limited (SLR) on behalf of the Council of the Isles of Scilly (CioS).

### **1.2 Background**

For a number of years waste materials have been accepted to the site. In some cases, and until recently, waste materials (e.g. domestic waste, cardboard, certain bulky wastes) were used as feedstock for an incinerator. Other wastes (e.g. glass, metal and other recyclables) were temporarily stored on site and sent for mainland disposal/recycling on a campaign basis.

Waste materials such as soil/green waste and construction and demolition (C&D) waste have historically had no onwards disposal route and have increased in volume on an annual basis as a result. Incinerator bottom ash (IBA) has also accumulated at the site.

In 2013 SLR undertook a Feasibility Study<sup>1</sup> to assess the potential for the reuse/recovery of some of the above material on site for the formation of visual screening bunds as part of the redevelopment of the site as a modern waste management site. The materials considered plausible for recovery included the following:

- Incinerator bottom ash (IBA) – considered potentially suitable for the construction of visual screening bunds. It was later agreed with the Environment Agency that a proportion of the material could be left in-situ/regraded as an existing bund and that the remaining material could be processed to form additional bunds as required;
- Soil/green waste – possibly suitable to form a growing medium over the ash bund; and
- C&D waste – hard materials could be suitable for production of secondary aggregates for use in site construction projects. Fine (soil) material could be suitable as soil forming materials over ash bunds.

SLR's 2013 report, which should be read in conjunction with this document and which is included as Appendix A, concluded that:

1. Subject to obtaining Planning Permission and a suitable Environmental Permit (now obtained) the materials listed above were considered likely to be suitable for use in future bund construction and in the context of the continued operation of the site as a waste facility;
2. Short term risks during the construction phase were considered likely to be higher than long term risks associated with recovery of the material in bunds, however it was considered that short term risks could be managed in such a way to avoid unacceptable risks to human health or the environment.

---

<sup>1</sup> Waste Material Reuse Feasibility Study, SLR Consulting, 2013 (Ref: 416.03263.00001)

3. The risk assessment undertaken indicated that the use of materials for bund construction would not result in a significant, ongoing, risks to Controlled Waters;
4. A watching brief should be maintained throughout the duration of redevelopment works such that if unexpected contamination is encountered risks are re-assessed and remedial works undertaken if deemed necessary.

Part of the above report, and the subject of this document, involved a preliminary assessment of risks associated with asbestos. The 2013 report concluded the following with respect to asbestos risk:

1. ACMs in all material types was identified as a key issue with respect to the reuse of the material;
2. An exercise to collect visible ACMs and place them within sealed skips for later off-site disposal was considered likely to considerably improve the situation;
3. The ACMs observed on site were noted to comprise lower risk asbestos i.e. those contained within a firm matrix and that are not prone to significant fibre release unless significantly agitated/crushed;
4. Fragmented asbestos and some loose fibres were identified in all four waste types (ash, soil/green waste, mixed/ash waste and C&D waste) considered for potential reuse;
5. Other than removal of surface asbestos (i.e. asbestos sheets) the volume of asbestos present was considered to not necessarily justify the remediation of the stockpiled material specifically to reduce asbestos content if the materials are to be retained on site in the future;
6. The risks posed to human receptors (site operative and local residents) was considered low; and
7. The presence of some asbestos materials in stockpiled waste should not prevent the reuse of the material at Porthmellon providing risks are frequently reviewed and certain precautions undertaken.

### **1.3 Report Purpose**

The purpose of this report is to update the asbestos assessment undertaken in 2013 and provide a proposed methodology for the management of asbestos risk during the processing/reuse of the materials in question.

The asbestos assessment has been updated in line with the latest Ciria Guidance<sup>2</sup> for the assessment of asbestos at contaminated sites. An addendum waste classification has also been undertaken in line with the latest guidance<sup>3</sup>.

In relation to the proposed Asbestos Protocol this has been included for the benefit of Contractors considering tendering for works involving the construction of a Waste Transfer Station and associated earthworks. The successful Contractor will need to manage asbestos risk during the processing, stockpiling and reuse of materials that contain asbestos. The Protocol presented within this document is not intended to represent instructions to the Contractor, rather it provides a suggested approach, the standards of which need to be met or exceeded by the Contractor's own Method Statements prior to commencement of the works.

---

<sup>2</sup> Asbestos in soil and Made Ground: a guide to understanding and managing risks, Ciria, 2014

<sup>3</sup> Technical Guidance WM3. Hazardous Waste – Guidance on the classification and assessment of waste (1<sup>st</sup> Edition 2015). Environment Agency



## **1.4 Report Structure**

Section 2 provides a summary of the 2013 site investigation with respect to the presence of asbestos. Section 3 provides an updated asbestos risk assessment in line with current Guidance, and following a site visit undertaken by SLR in August 2015. Section 4 presents an updated waste classification of the material in question which is relevant only if any off-site disposal of the material is required. The remaining sections comprise an Asbestos Protocol which recommends methods by which asbestos risks could be reduced during the processing and reuse of the material.

## **2.0 SUMMARY OF 2013 ASBESTOS SITE INVESTIGATION**

### **2.1 Introduction**

The following factual account of the findings of a site investigation undertaken by SLR in April 2013 are taken from the report included as Appendix A. The 2013 report included an asbestos risk assessment. The information presented below, along with that obtained from a site visit in August 2015, have been used to provide an updated asbestos risk assessment in Section 3 of this document.

### **2.2 Rationale**

The purpose of the 2013 site investigation, with respect to asbestos, was to:

1. establish that the site investigation itself did not result in excessive asbestos fibre release while waste materials were disturbed; and
2. to use the data obtained to assess risks associated with current daily activities at the site and the reuse of materials in the future that might contain asbestos.

### **2.3 Investigation Scope of Works**

The scope of works for the site investigation comprised the following elements:

- Site walkover to visually assess surface asbestos fragments, other potential contaminants and hazards;
- Excavation of trial holes by mechanical excavator;
- Excavation of shallow, hand dug pits;
- Visual assessment of shallow soils from the above excavations;
- Collection of representative soil samples and suspected ACMs for laboratory analysis.

### **2.4 Site Inspection**

During the initial inspection of the site suspected asbestos containing materials were identified as whole or fragmented asbestos cement bonded sheets. Samples of three different types of materials were taken for laboratory analysis. The locations in which asbestos were predominantly identified are shown on Drawing 1. These areas were avoided during subsequent trial pitting such that deliberate disturbance of asbestos did not occur.

### **2.5 Trial Pits**

Fourteen trial pits (designated TP101 to TP114) were excavated by mechanical excavator on 24<sup>th</sup> and 25<sup>th</sup> April 2013. The location of trial pits are shown on Drawing 2. The rationale for trial pit locations was to give a good general coverage of waste materials that may later be suitable for construction of bunds at the site or use in other construction activities. Trial pits were located as follows:

- TP101 to TP103 – IBA stockpile;
- TP104 to TP107 – soil/green waste stockpile;
- TP108 to TP110 – general waste comprising ash, soil and other materials;

- TP111 to TP114 – C&D waste.

Trial pits were generally around 4m in length and extended to depths up to 3.6m.

## **2.6 Hand Excavated Pits**

Three hand pits (HP115 to HP116) were excavated on the southern face of the soil/green waste stockpile. Shallow soil samples were collected in this area to avoid disturbance of the vegetated bunds that currently shield local residents from the site and since a public footpath is present in this area.

## **2.7 Waste Sampling and Laboratory Analysis**

During the excavation of trial pits and hand pits representative samples were collected at 1m intervals. Sub-samples were then submitted for laboratory analysis, including asbestos.

In the first instance 17 soil/waste samples were submitted for an asbestos screen. This level of analysis was designed only to establish whether asbestos is present within a given sample.

Following the above a full asbestos quantification to detection limit of 0.001% was undertaken on 13 waste samples.

Three ACM samples were also submitted for laboratory analysis.

## **2.8 Asbestos Observations**

A full description and photographs of ACM observations during the 2013 site investigation is included at Appendix A. A summary is presented below.

Materials suspected to contain asbestos were observed in several areas of the site at surface level, notably those areas marked on Drawing 1.

In addition to asbestos observed at surface level, fragmented asbestos was identified in all four material types investigated i.e. ash, green waste/soil, mixed wastes and C&D waste.

Within the ash material no asbestos was visible at surface level. Within trial pits occasional fragments of asbestos sheet were generally reported.

Asbestos materials within the soil/green waste appear to be limited to the southern end of stockpile on the inner (i.e. site) face. In this area several large sheets are present along with fragmented asbestos. Asbestos was not observed in about 50% of the stockpile.

Asbestos containing materials were most evident in the area of trial pits TP108 and TP109. This area was probably formed by a core of ash material, but in reality comprised mixed waste made up of soil, ash, construction materials, bulky waste and other wastes. Asbestos cement sheet was present at surface level and fragmented within the deeper layers of waste.

In the C&D waste stockpile only rare incidences of asbestos cement in fragmented form were identified. Asbestos was not visible at surface level.

## **2.9 Asbestos Analysis**

### **2.9.1 ACM Samples**

Plates 1 to 3 below show the typical types of asbestos present at surface level. Samples of all three materials (Asbestos Samples 1, 2 and 3) were collected and tested. Of these three samples only Sample 3 was actually later confirmed to contain asbestos. These results are included as Appendix B and indicate the presence of chrysotile (white) asbestos only in this sample.

From the above SLR commented that materials were located across the bulky waste stockpile with the visual appearance of asbestos but that do not actually contain asbestos fibres. We further noted however that where suspected asbestos containing materials were identified within trial pits it was generally material such as that shown in Plate 1 below and that has been confirmed to contain chrysotile asbestos.

**Plate 1 – Asbestos Sample 1**





**Plate 2 – Asbestos Sample 2**



**Plate 3 – Asbestos Sample 3**



### **2.9.2 Asbestos Air Monitoring Results**

Throughout the 2013 site investigation asbestos air monitoring was undertaken around the perimeter of the working area and within the cab of the excavator used to construct trial pits.

The purpose of the air monitoring was to demonstrate that no unacceptable fibre release had occurred. The results of the air monitoring are included as Appendix C.

Fibre counts on microscope slides ranged from only 0.5 to 4.5 fibres, with a corresponding fibre concentration of <0.01 fibres/ml in most cases. A conservative “fail” in an enclosed environment (for example the stripping of asbestos materials within a building) would occur where 18 fibres were observed across 200 microscope fields and in this respect asbestos risk during the site investigation was very low.

Additionally, under UKAS accreditation, the analyst must include all fibres within the count, rather than specific asbestos fibres and it is quite common therefore for synthetic fibres to be included within the fibre count, especially within the excavator cab.

### 2.9.3 Waste Sampling Asbestos Results

In the first instance 17 soil/waste samples were submitted for an asbestos screen. The results of this process (Appendix B) are summarised in Table 1 below. The results indicated the presence of chrysotile (white) asbestos in most samples and amosite (brown) and crocidolite (blue) asbestos in several samples.

**Table 1 – Asbestos Screen Results**

	Asbestos Screen	Asbestos Screen (2)	Asbestos Screen (3)	General Description (Bulk Analysis)	General Description (2)	General Description (3)
TP 101	Chrysotile	Amosite	Crocidolite	Soil- Silt/Stone/Brick/Fibre Bundles	Soil- Silt/Stone/Brick/Fibre Bundles	Soil- Silt/Stone/Brick/Trace Fibre
TP 102	Chrysotile	Amosite	NA	Soil- Silt/Stone/Brick/Fibre Bundles	Soil- Silt/Stone/Brick/Fibre Bundle	NA
TP 103	Chrysotile	Amosite	NA	Soil- Silt/Stone/Brick/Fibre Bundles	Soil- Silt/Stone/Brick/Fibre Bundle	NA
TP 104	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/Fibre Bundles	NA	NA
TP 105	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/Fibre Bundle	NA	NA
TP 106	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Trace Fibres	NA	NA
TP 107	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Fibre Bundles	NA	NA
TP 108	NAD	NA	NA	Soil- Silt/Stone/Brick/MMMF	NA	NA
TP 109	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Fibre Bundle	NA	NA
TP 110	Chrysotile	Amosite	NA	Soil- Silt/Stone/Brick/MMMF/ Fibre Bundle	Soil- Silt/Stone/Brick/MMMF /Fibre Bundle	NA
TP 111	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Fibre Bundle	NA	NA
TP 112	Chrysotile	Crocidolite	Amosite	Soil- Silt/Brick/Stone/MMMF/ Tile	Soil- Silt/Brick/Stone/MMMF /Tile	Soil- Silt/Brick/Stone/MMMF /Trace Fibres
TP 113	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Trace Fibres	NA	NA
TP 114	NAD	NA	NA	Soil- Silt/Stone/Brick/MMMF	NA	NA
HP 115	NAD	NA	NA	Soil- Silt/Stone/Brick/MMMF	NA	NA

	Asbestos Screen	Asbestos Screen (2)	Asbestos Screen (3)	General Description (Bulk Analysis)	General Description (2)	General Description (3)
HP 116	NAD	NA	NA	Soil-Silt/Stone/Brick/MMMF	NA	NA
HP 117	Chrysotile	NA	NA	Soil-Silt/Stone/Brick/MMMF/Trace Fibres	NA	NA

The 13 samples in which asbestos had been detected were submitted for further quantitative analysis to determine the actual concentration of asbestos on a percent, weight for weight basis. The results are summarised in Table 2 below.

**Table 2 – Asbestos Quantification Results**

Asbestos Mass %	
TP101	0.029
TP102	<0.001
TP103	<0.001
TP104	0.002
TP105	<0.001
TP106	NA
TP107	<0.001
TP109	0.008
TP110	0.01
TP111	0.437
TP112	NA
TP113	NA
HP117	NA

The above results indicate asbestos at trace amounts and/or below detection limits in 8 samples. The highest concentration was in a sample of C&D waste (0.473% w/w) and the average concentration of asbestos was below 0.1% w/w, which is the carcinogenic and Hazardous Waste threshold.

### **3.0 ASBESTOS RISK ASSESSMENT AND WASTE CLASSIFICATION**

#### **3.1 Introduction**

This section replaces the following section of the 2013 report at Appendix A:

- Section 6.6 PPL1 and 3 – Asbestos Risk Assessment (and sub-sections);
- Section 7.0 – Waste Classification, Paragraphs 3, 4 and 5.

The above have been replaced with the below updated assessment for the following reasons:

1. SLR undertook a visual assessment of ACMs in early August 2015;
2. The manner in which longer-term risks associated with asbestos are assessed has changed since the release of the Ciria Guidance (see Ref 2);
3. Waste classification of asbestos and materials that contain asbestos has changed slightly within the latest WM3 Guidance (see Ref 3).

Figures are usually described as 'Drawings' – but you may occasionally want to import and label as small figure. For example:-

#### **3.2 Site Visit August 2015**

SLR undertook a site visit on 6<sup>th</sup> August 2015. The purpose of the visit was to satisfy ourselves that, on a visual basis, the nature and extent of fragmented asbestos located at the site since the 2013 site investigation is not likely to:

1. Have increased significantly since 2013;
2. Increased the asbestos risk profile of the legacy waste with respect to asbestos.

During the site visit general observations were as follows:

- The basic layout of the site is similar to that observed during the 2013 site investigation;
- Legacy domestic (black bag) waste has been almost entirely cleared from the site. Current domestic waste inputs are placed within the bunker of the site incinerator (now disused) before being removed from the site in bags;
- A substantial proportion of the legacy bulky waste has been shredded and removed from the site in bags;
- The soil/green waste stockpile does not significantly differ from that observed in 2013;
- The C&D waste stockpile has been slightly re-profiled and added to, but is broadly similar in nature to that observed previously;
- IBA waste is similar in profile and extent, but is now easier to identify visually since the removal of domestic legacy waste;
- Mixed waste through the centre of the site is similar to that observed in 2013, although is added to on a daily basis;
- Since 2013 a weighbridge and additional site office has been installed. In this area of the site efforts have been made to clear certain waste (e.g. glass waste) and prepare a level platform ready for the construction of a concrete hardstanding.

The below photographs summarise asbestos observations made during the site visit.



Several large fragments of suspected asbestos-containing cement sheet were observed within shall soils adjacent to the site weighbridge. This area is due to be developed as concrete hardstanding prior to commencement of the legacy waste Contract.

**Plate 4 – Suspected ACMs Adjacent to Weighbridge**



**Plate 5 – Suspected ACMs Adjacent to Weighbridge**





A number of suspected cement-bonded ACMs were identified immediately south of the mixed waste/C&D waste stockpiles in material that had recently been deposited at the site.

**Plate 6 – Suspected ACMs in Recently Placed Waste**



**Plate 7 – Recently Placed Waste – Suspected ACMs Present**





Occasional suspected ACMs were observed on the C&D waste stockpile, but these did not appear to be any more widespread than that observed in 2013.

**Plate 8 – C&D Waste Stockpile**



Occasional fragments of suspected asbestos sheet were observed on the surface of the soil/green waste stockpile.

**Plate 9 – Suspected ACMs on Soil/Green Waste Stockpile**





**Plate 10 – Suspected ACMs on Soil/Green Waste Stockpile**



Numerous suspected ACMs were observed on the mixed waste stockpile, although the extent of these was similar to that observed in 2013.

**Plate 11 – Suspected ACMs on Soil/Green Waste Stockpile**





Occasional suspected ACMs were observed outside the site workshop in an area previously used to store glass waste.

**Plate 12 – Suspected ACMs in Former Glass Waste Storage Area**



From the site visit we would make the following observations:

1. Some efforts appear to have been made in relation to removing surface ACMs to a sealed skip;
2. Suspected ACMs are present within material believed to have been placed at the site by members of the public since the 2013 site investigation;
3. ACMs are likely to be present in all material types that require processing and will ultimately be used for bund construction;
4. Only cement products were observed during the site visit;
5. The risk profile of asbestos is likely to be the same, or similar, as that commented on following the 2013 site investigation.

As a result of the above we would comment that information obtained in 2013 remains relevant and that it is possible to update the asbestos risk assessment as per the sections below.

### **3.3 Asbestos Human Health Risks**

Asbestos becomes a risk to human health if asbestos fibres are inhaled. There are four main diseases commonly associated with asbestos inhalation; namely:

- Mesothelioma;
- Lung cancer;
- Asbestosis; and
- Pleural thickening.

Asbestos is a Class 1 carcinogen and as such harm to human health could occur at any level of exposure. In practice however, elevated risk is present when a high level of exposure occurs and an individual breathes in asbestos fibres. The Health and Safety Executive (HSE) provides a variety of information in relation to working with asbestos and asbestos risks are controlled in the UK by the Control of Asbestos Regulations 2012.

SLR has been retained on a significant number of asbestos-contaminated sites in the UK and has considerable experience of dealing with the unique risks present. In practical terms much more important than the percentage of asbestos present is the type of asbestos, the matrix in which it is present and the propensity for actual fibre release and human exposure. The three main types of asbestos likely to be encountered on a development or waste site are:

1. Chrysotile (white asbestos);
2. Amosite (brown asbestos); and/or
3. Crocidolite (blue asbestos).

Although it is true that the shape and structure of amosite and crocidolite make them potentially more harmful than chrysotile, more important than the asbestos type is usually the matrix in which the asbestos is present and therefore the propensity for asbestos fibre release and actual risk of human inhalation. For this reason SLR describes the following general asbestos material types:

- Type 1 – asbestos contained within a firm matrix – this includes asbestos cement products, textured decorative coatings, asbestos paints and any item of bitumen, plastic, resin or rubber (e.g. vinyl floor tiles, electric cables, roofing felt).
- Type 2 – asbestos not contained within a firm matrix – for this project these are any asbestos containing materials not listed above, but particularly asbestos insulation (e.g. lagging materials) and asbestos insulating board (AIB).

The risks associated with the above differ substantially. Type 1 asbestos has a much lower propensity for fibre release and in many cases requires no actual remediation when encountered on a development site.

Two of the key objectives of the proposed site investigation undertaken in 2013 were to establish the significance of asbestos at the site and provide evidence that the investigation itself was undertaken safely and with due regard to on and off-site human receptors.

### **3.4 Asbestos Contamination Legislation**

#### **3.4.1 Waste Management**

Materials, including waste soils and construction waste, become hazardous waste if the asbestos content exceeds the 0.1% carcinogenic threshold on a weight for weight (w/w) basis. In practice whether the asbestos content is above or below 0.1% is difficult to prove and depends on whether asbestos containing materials (ACMs) and/or loose asbestos fibres are present. Under current legislation (WM3, Ref 3) SLR's interpretation of whether the presence of asbestos renders waste soils or aggregate hazardous is as follows:

1. If no visible asbestos is present and asbestos fibre content is below 0.1% - the material is non-hazardous waste.
2. If no visible asbestos is present and asbestos fibre content is above 0.1% - the material is hazardous waste.

3. If visible asbestos is present and asbestos fibre content is above 0.1% - the material is hazardous waste.
4. If visible asbestos is present and asbestos fibre content is below 0.1% - the parent material is non-hazardous BUT the asbestos is hazardous waste. In this case the material will be given two EWC codes and will be treated as though all the material is hazardous waste until the visible asbestos has been removed.

The above effectively means that if asbestos is visibly present then it will require disposal to a hazardous treatment centre and will remain hazardous waste until the fragments of ACM have been removed.

### **3.4.2 Risks to Human Health**

Risks associated with asbestos within soils or waste construction materials are generally less understood than other contaminants. Historically, reference is often made to an ageing ICRL<sup>4</sup> threshold of 0.001%. In practice, and in SLR's experience, the actual risk present relates to the propensity for fibre release. Risks will generally be lower when the asbestos is bound in a firm matrix (such as asbestos cement) and where the "soil" is cohesive. Recently two joint industry working groups have looked at the issue of asbestos within soils and Ciria recently published a guide to managing asbestos risks in soil<sup>2</sup>. The guidance offered by the Ciria document is significant in terms of longer-term asbestos risk and forms part of the reason for this updated asbestos statement.

The most reliable way to determine "actual" risks from asbestos is to undertake asbestos air monitoring while the material is disturbed under controlled conditions. This can be undertaken by creating conditions that might reasonably be expected to occur in the future and is known as activity based sampling (ABS). It should be noted however that under the Control of Asbestos Regulations (CAR) 2012, this could constitute an intentional release of asbestos fibres and thus true ABS is not permitted in the UK. In this case however the 2013 site investigation was not designed solely to consider fibre release – there was a generally requirement to investigate (and therefore disturb) the material quite apart from any presence of asbestos.

From the above a distinction also needs to be made between short-term, acute asbestos exposure and longer term risks. In this case the two scenarios that we need to consider at Porthmellon are:

1. Short-term risks during the processing and placement of the legacy waste material – these can usually be managed with a combination of asbestos air monitoring, further soil testing, PPE/RPE and asbestos awareness training;
2. Longer-term risks associated with the use of material that contains asbestos in visual screening bunds.

To assess the short term risks during the construction phase of the work we can consider the physical nature of the asbestos, the laboratory analysis and the results of air monitoring. With respect to the latter CAR 2012 sets control limits (0.1 f/ml over four hours and 0.6 f/ml over 10 minutes) and a clearance indicator threshold (<0.01 f/ml) for the concentration of asbestos in air associated with work activities. Employers are also required to reduce exposure to asbestos to the lowest level practical and the known presence of asbestos in a premises should be recorded (although admittedly this is aimed at the built environment).

**From the above it follows that we can state that the processing and placement of**

---

<sup>4</sup> Interdepartmental Committee on the Remediation of Contaminated Land

**legacy wastes as part of the Contract will not result in excessive asbestos risk if:**

1. The CAR Control Limit is not exceeded;
2. Other measures, perhaps those discussed in the Asbestos Protocol below, are adopted to further reduce exposure to asbestos;
3. The presence of asbestos is documented in advance of the works (as per this document) and once the material has been permanently recovered in visual screening bunds (similar to an Asbestos Register).

In terms of longer-term risks associated with the permanent reuse of material that may contain asbestos in visual screening bunds, in SLR's 2013 report a similar approach to the above was used. The report essential states that since neither the Control Limit or Clearance Indicator set by CAR was exceeded while the material was actively disturbed, significant asbestos fibre release should not occur once the material has been placed.

While we largely remain of the same opinion as above, the Ciria C733 document entitled "Asbestos in soil and Made Ground: a guide to understanding and managing risks" was released in 2014 and suggests alternative methods for the assessment of longer-term asbestos fibre risk. It states that neither the Control Limit or Clearance Indicator set by CAR should be used as generic assessment criteria for assessing long-term risks posed by asbestos. C733 goes on to state that exposure-risk models that will predict risks associated with lung cancer and mesothelioma are available and that these are a better method by which to predict long-term risks.

SLR would comment that to date a level of risk assessment as above has not been undertaken. Risks have so far been assessed based on soil concentrations of asbestos, the type of asbestos encountered and by reference to the CAR Control Limit and Clearance Indicator. It would be possible to undertake an additional risk assessment in line with comments within C733. The following information would be required:

- Exposure estimate in fb/ml.hours;
- Type of asbestos;
- Duration of exposure;
- Age of subject when exposure started; and potentially
- Information about whether the exposed individual is a smoker.

In particular we would note that much lower detection limits on asbestos air monitoring would be required to complete the above. We would also need to carefully consider the sites commercial use, versus adjacent residential properties, school and foot path.

In summary of the above, in terms of the justification of the reuse of the legacy waste in screening bunds and which is likely to contain asbestos, SLR's view is that there are two options:

1. Undertake a further phase of site investigation, specific air monitoring and risk assessment to demonstrate that risks are likely to be within acceptable limits; or
2. Undertake remedial works that will break the linkage between the source of contamination (the legacy waste in bunds) and receptors (future site workers, local residents etc).

**Given the unique setting of the site and the attention it has attracted from local residents in terms of the presence of asbestos it is considered that the simplest way to manage asbestos risk in legacy waste may be to:**

1. Manage short term risks during the construction phase;



2. Mitigate long term risks by placing a cover system or suitable membrane above the material to prevent long term exposure.

### **3.5 Interpretation of Asbestos Results at Porthmellon**

#### **3.5.1 Visual Assessment**

Materials suspected to contain asbestos were observed in several areas of the site at surface level, notably those areas marked on Drawing 1. The August 2015 site visit also identified suspected surface level ACMs, including within recently placed construction waste. Although the presence of other asbestos materials cannot be entirely discounted the only materials observed on site were fragmented cement sheets (i.e. Type 1 asbestos).

In addition to asbestos observed at surface level, fragmented asbestos was identified in all four material types investigated in 2013 i.e. ash, green waste/soil, mixed wastes and C&D waste.

Within the ash material no asbestos was visible at surface level in 2013 or 2015. Within trial pits occasional fragments of asbestos sheet were generally reported. These are likely to be present due to cross-contamination by other waste streams or, possibly, where asbestos containing materials have been placed in the incinerator. In one case (TP110) a pocket of asbestos was encountered at a depth of around 2m. This particular area of the site is at the interface of other materials such as bulky and mixed waste.

Asbestos materials within the soil/green waste appear to be limited to the southern end of stockpile on the inner (i.e. site) face. In this area several large sheets are present along with fragmented asbestos. Asbestos was not observed in about 50% of the stockpile during the 2013 site investigation, however additional asbestos may be present within the stockpile now.

Asbestos containing materials were most evident in 2013 in the area of trial pits TP108 and TP109. This area is probably formed by a core of ash material, but in reality comprises mixed waste made up of soil, ash, construction materials, bulky waste and other wastes. Asbestos cement sheet is present at surface level and fragmented within the deeper layers of waste. Efforts have been made to remove some of this material, however numerous fragments of suspected asbestos sheet were observed during the August 2015 site visit.

In the C&D waste stockpile only rare incidences of asbestos cement in fragmented form were identified. Only limited asbestos fragments were visible at surface level in 2015. On the basis that the C&D waste stockpile is frequently added to further ACMs could be present.

On the basis of the above an initial (i.e. qualitative) view of asbestos risk remains largely as per the 2013 report, namely:

1. Asbestos materials have been accepted to the site historically;
2. The August 2015 site visit indicates that in some cases asbestos is likely to have been accepted to the site quite recently;
3. Site staff have undergone asbestos training to increase awareness and there is evidence that efforts have been made to remove some ACMs to sealed skips;
4. Asbestos appears to be concentrated in several key areas of the site, but there is potential for small amounts of asbestos to be present anywhere on site;
5. Based on the type of asbestos present, the risk of significant fibre release is likely to be low. The predominant asbestos type appears to be cement sheet. Cement sheet is usually only 10% to 15% asbestos and the fibres are bound within a firm matrix. Providing the material is not significantly agitated (e.g. crushed, cut etc) risks

associated with the material being present at the site now, or in the future within bunds, are likely to be low.

### **3.5.2 Laboratory Analysis Results**

From the 2013 site investigation the initial laboratory analysis results indicated the presence of asbestos in the majority of samples. This level of analysis comprised a simple screen. Further, quantitative analysis was then undertaken on 13 samples. This indicated measurable concentrations of asbestos in the following samples:

- TP101 (ash waste) 0.029% asbestos;
- TP104 (soil/green waste) 0.002% asbestos;
- TP109 (mixed waste) 0.008% asbestos;
- TP110 (mixed waste/ash waste) 0.01% asbestos; and
- TP111 (C&D waste) 0.437% asbestos.

It is not appropriate to speculate directly as to the risk that the above poses, since this is a function of the actual release of respirable asbestos fibres. We would comment however that asbestos fibre concentrations were generally quite low and in most cases below the 0.1% threshold that would render the material hazardous waste if off-site disposal was required.

### **3.5.3 Air Monitoring Results**

The results of visual assessment and laboratory analysis from the 2013 site investigation confirms the presence of asbestos both as fragmented asbestos sheet and loose fibres. In order to assess the actual potential for asbestos fibre release into the air (and therefore the potential for human receptors to be at risk) SLR undertook asbestos air monitoring during the 2013 site investigation. In that report (Appendix A) SLR's conclusions with respect to asbestos air monitoring were.

- That the movement of soils during the site investigation did not result in excessive asbestos fibre release into the air (in other words the Control Limit was not exceeded); and
- That the movement of the same material to construct bunds in the future is unlikely to result in excessive risks to human health.

While we would generally stand by the above comments, as discussed in Section 3.4.2 above the level of assessment undertaken to date serves only to illustrate that short term risks while the material is processed and placed are likely to be within acceptable limits. Risks associated with the long term presence of asbestos-impacted material within visual screening bunds need to be assessed separately using dedicated risk-models and lower detection limits OR the source-pathway-receptor linkage should be broken.

## **3.6 Short Term Risks during Construction**

From the above sections SL's view would be that short term risks as the material is processed, stockpiled and placed within visual screening bunds are likely to be low as long as certain controls are put in place. Suggested control measures are discussed in Section 4 of this document. They include:

1. a continued "watching brief" for asbestos type and retention of a qualified consultant to re-evaluate risks if further types of asbestos are encountered;
2. reduction of soil disturbance and unnecessary excavation;
3. provision of detailed method statements and asbestos awareness training;

4. avoiding double handling of material;
5. reducing drop heights and avoiding cross contamination;
6. dust suppression with mains quality water and/or surfactants;
7. provision of disposable overalls and P3 rated filter masks.

### **3.7 Longer Term Risks to the Development**

In 2013 SLR commented that the presence of fragments of asbestos and loose asbestos fibres in ash, mixed waste, soil/green waste and C&D waste need not prevent its use on site for the construction of bunds. The work undertaken in 2013 suggests that the risks of exposing site workers and local residents to respirable fibres are likely to be low. We remain of the opinion that the material can be reused on site, however at this stage to justify the reuse of the material would require:

1. An additional phase of site investigation and risk assessment; OR
2. Reuse of the material below some form of clean cover system or capping layer.

Of the above two options the use of a cover system to cap the material is considered the most viable option. The Contractor appointed to construct the visual screening bunds will ultimately be responsible for the management and placement of the material and for providing a design for, and implementation of, a capping system. SLR would suggest that the following strategy would be appropriate in this instance:

1. Short-term risks should be managed as per Section 3.6 above. A suggested Asbestos Protocol is also presented as Section 4 of this document;
2. While the visible asbestos present comprises only of fragmented asbestos sheeting there is not likely to be a net environmental benefit associated with its removal. This is the case since it is highly unlikely that all fragments would be removed, loose fibres are also present and the material itself is low risk. Legacy wastes containing this material can therefore be used in bund construction without removal of the ACMs providing the below criteria are met;
3. A watching brief for other types (i.e. Type 2) of asbestos should be maintained. Type 2 asbestos should be removed under controlled conditions if encountered on the basis that it represents a higher risk;
4. Likewise larger asbestos sheets should be removed if encountered since they are likely to become fragmented and cause further asbestos contamination;
5. Once the material has been successfully placed in bunds a cover or capping system should be used to break the long-term source-pathway-receptor linkage. Reference to Ciria C733, Section 15.2.1 is suggested. An example cover system in this document comprises of 1000 gauge geotextile protected with 300mm of aggregate. Such a cover system is likely to be sufficient at Porthmellon;
6. Following the above the works should be recorded and a record of the material containing asbestos kept on site for future reference and as any maintenance of the bunds are required.

### **3.8 Waste Disposal**

Section 3.4.1 above commented on four possible scenarios in relation to soil/granular material that could contain asbestos, and with reference to its waste classification if disposal is required:

1. If no visible asbestos is present and asbestos fibre content is below 0.1% - the material is non-hazardous waste;
2. If no visible asbestos is present and asbestos fibre content is above 0.1% - the material is hazardous waste;

3. If visible asbestos is present and asbestos fibre content is above 0.1% - the material is hazardous waste.
4. If visible asbestos is present and asbestos fibre content is below 0.1% - the parent material is non-hazardous BUT the asbestos is hazardous waste. In this case the material will be given two EWC codes and will be treated as though all the material is hazardous waste until the visible asbestos has been removed.

In the case of materials at Porthmellon Scenario 4 applies in most cases and Scenario 3 applies in the case of material recovered from TP111 in the C&D waste.

Assuming that the legacy waste materials are successfully used on site, then the above is not relevant. If any of the material requires off-site disposal then:

1. All material is considered hazardous waste until the ACMs are removed;
2. When asbestos fibre content exceeds 0.1% the material is hazardous waste even if ACMs are not present. This is currently the case only in TP111.

It should also be noted that there will be a requirement for the screening of the majority of the legacy wastes to remove extraneous materials such as timber, plastics, metal, plasterboard and other wastes. Where such material is separated and requires off-site disposal care should be taken that ACMs are not present within the material. If ACMs are present within the material then Scenario 4 also applies i.e. the material will need to be treated as hazardous waste until the ACMs are removed.

### **3.9 Summary**

In summary of the above sections SLR would comment that our view of the nature and extent of asbestos in legacy waste materials is largely unchanged since 2013. We remain of the opinion that the material is suitable for use in the construction of visual screening bunds if certain precautions are taken.

In terms of changes in our recommendations from the 2013 report we would note that:

1. The way in which the material should be classified if any off-site disposal is required has changed/confirmed in guidance released since 2013. The material should be regarded as hazardous waste if any visible ACMs are present and if asbestos fibres above 0.1% are present;
2. We can no longer state that long-term risks are within acceptable limits if the material is used without a cover system/capping layer. To do so would require an additional level of risk assessment. Our view, particularly given the sensitivity of the site and local residents concerns, is that the most appropriate course of action is to cap the waste reused in bunds with "clean" soils or a capping system.

Short-term risks associated with the processing, stockpiling and placement of the material is generally regarded as a low-risk activity, however a number of precautions and health and safety measures will be required. The successful Contractor will be responsible for the implementation of such measures, however the remainder of this document makes some recommendations that would be regarded by SLR as suitable in this case.

## **4.0 SUGGESTED ASBESTOS PROTOCOL**

This document presents a proposed Asbestos Management and Monitoring Protocol for the management of risks from asbestos containing materials (ACMs) during the processing, stockpiling and permanent placement of legacy waste materials in visual screening bunds.

It should be noted that the Contractor will be required to produce their own Risk Assessments and Method Statements (in particular a CAR 2012 compliant risk assessment) and manage any asbestos licensing/notification issues. The following is intended as a guide to this process and should be regarded as the minimum standard for the management of asbestos risks during the works.

### **4.1 Background**

The previous sections of this document present a summary of known asbestos issues in legacy waste materials. Loose asbestos fibres have been identified in the material, however the CAR 2012 Control Limit 0.1 fibres per millilitre of air) has not been exceeded during the disturbance of the material by trial pitting.

ACMs are present within the material, generally as fragmented asbestos cement sheet. This material is considered relatively low risk and will therefore not generally require removal from the waste prior to the use of the material in bunds. There is potential for other types of asbestos to be present however and this may require removal.

With respect to longer-term potential health risks arising from the permanent reuse of the material, there are discussed in the sections above. It is considered that the material is suitable for recovery in bunds providing that:

- Short-term risks during processing and placement are managed as below (or by equivalent means);
- The material is capped to prevent future contact once bund construction is complete.

### **4.2 Purpose of Document**

The baseline position under this Protocol is that:

- Cement bonded ACMs are known to be present at the site; BUT
- Those ACMs will not be removed/remediated unless asbestos-containing materials are identified that present a higher risk profile than that currently identified;
- Retention and processing of legacy waste on site is subject to certain controls as documented below.

The purpose of this document is to provide a mechanism by which the Contractor can assess the nature of asbestos present and the level of potential health risk as the processing of the material proceeds if and when further asbestos-containing materials are encountered and confirmed.

The above is provided in the sections below in the form of an Asbestos Management and Monitoring Protocol for the identification and management of potential risk from asbestos-containing materials.

The key principles of this document are as follows:

- The Contractor must be satisfied prior to commencement of the development that based on current information there are no known issues likely to result in additional costs due to asbestos;
- The Contractor must work in accordance with the Asbestos Management and Monitoring Protocol with respect to the management of asbestos risk and/or produce an equally robust methodology;
- Fragmented “Type 1” asbestos may be removed from the materials if preferred, but this is not required to demonstrate that the material is suitable for use for bund construction as long as bunds are completed with a cover system;
- Larger fragments of Type 1 asbestos (for example partial or whole sheets of asbestos cement) will be removed to suitable containers (i.e. sealed skips) to prevent further cross contamination;
- Type 2 asbestos will require removal from the waste in all cases – which will require additional controls and legislative compliance;

In practical terms the above is proposed to work as follows:

- The Contractor will produce a CAR-compliant risk assessment;
- Based on current potential health risk levels works are likely to be able to commence without specific asbestos-related health and safety measures;
- The Contractor will ensure that employees engaged in site activities have had an appropriate level of asbestos awareness training in order to control “perceived” asbestos-related health risks;
- Where asbestos containing materials are encountered on site an initial Type Assessment will be undertaken by the Contractor;
- Based on the Type Assessment certain types of asbestos-containing materials are deemed to present a very low risk and will therefore trigger no specific action i.e. they do not need to be removed from the waste;
- Based on the Type Assessment certain other types of asbestos-containing materials may be such that risks will require re-assessment before works recommence. In this case the Contractor will supply a Suitably Qualified Person (SQP) to confirm whether more hazardous forms of asbestos-containing materials are present;
- Where the above confirms the presence of larger Type 1 ACMs or Type 2 asbestos these will be removed from the waste by the Contractor.

## **4.3 Legislation and Limits of Responsibility**

### **4.3.1 General Responsibilities and Relevant Legislation**

Table 3 below describes general Health and Safety responsibilities under relevant, current legislation. In particular Table 3 sets out specific responsibilities for the Client, the Contractor and any sub-contractor(s).

**Table 3 - Managing Asbestos Risk on Site – Legal Duties**

<b>Legislation</b>	<b>Client Duties</b>	<b>Main Contractor Duties</b>	<b>Subcontractor Duties</b>
Health and Safety at Work Act	Seek evidence that a safe system of work is in place before allowing work to begin.	Ensure there is a safe system of work in cases where risks cannot be eliminated/avoided.	Ensure there is a safe system of work in cases where risks cannot be eliminated/avoided.
Management of Health and Safety at Work Regulations 1999	Cooperate and coordinate with other employers on site.  Decide on and specify the level of supervision and monitoring of work.	Carry out suitable and sufficient risk assessment and review it if circumstances change.  Cooperate and coordinate with other employers on site.  Provide instruction and training to staff including risks to their health and safety.  Put in place procedures for serious or imminent danger.	Cooperate and coordinate with other employers on site  Carry out suitable and sufficient risk assessment and review it if circumstances change.  Provide instruction and training to staff.
Control of Substances Hazardous to Health Regulations 2002		Carry out risk assessment.  Prevent exposure or adequately control.  Monitor exposure.  Provide suitable PPE.	Carry out risk assessment.  Prevent exposure or adequately control.  Monitor exposure.  Provide suitable PPE.
Construction, Design and Management Regulations 2007	Provide suitable information to contractors.  Appoint competent contractor to do the work envisaged.  Allow sufficient time and resources for the project.	Establish site rules and communicate them to all concerned.  Train staff and ensure competence in all cases.  Plan and manage & monitor construction work.  Suitable welfare arrangements & site security.	

### 4.3.2 Control of Asbestos Regulations 2012

In addition to the above general legislation, all parties are required to comply as far as reasonably practicable with the Control of Asbestos Regulations (CAR) 2012. CAR 2012 were introduced to combine domestic legislation regarding:

- Prohibition of Asbestos;
- Control of Asbestos at Work;
- Asbestos Licensing.

CAR 2012 came into force on 6 April 2012 and updated CAR 2006 to take account of the European Commission's view that the UK had not fully implemented the EU Directive on exposure to asbestos (Directive 2009/148/EC).

Although the Regulations are aimed predominantly at the built environment and do not specifically address asbestos soil contamination, since they introduce the "Duty to Manage" asbestos, the Client has identified areas in which they can currently demonstrate compliance – as summarised in Table 4 below.

**Table 4 - Control of Asbestos Regulations – Client Compliance**

<b>Client Duties</b>	<b>Client Compliance</b>
Take reasonable steps to determine the location and condition of materials likely to contain asbestos.	Site investigations completed to, results included with this document.
Presume materials contain asbestos unless there is strong evidence that they do not.	Fundamental concept during site investigation. Proposed Protocol makes provision for identification of high-risk asbestos types.
Keep an up-to-date record of the location and condition of the asbestos-containing materials (ACMs) or presumed ACMs in the premises.	All incidences of asbestos containing materials recorded to date as per sections above. Record to be updated By the Contractor if and when further asbestos is identified.
Assess the risk of the likelihood of anyone being exposed to fibres from these materials.	Air-monitoring undertaken. Further air monitoring to be undertaken on a regular basis.
Prepare a plan setting out how the risks from the materials are to be managed.	As detailed in this document and task risk assessments to be completed by the Contractor.
Take the necessary steps to put the plan into action.	TBC – one of the purposes of this document.
Review and monitor the plan periodically.	Risk assessment to be updated continually as required.
Provide information on the location and condition of the materials to anyone who is liable to work on or disturb them.	Detailed in the sections above from previous site investigation.

### 4.3.3 Specific Responsibilities

In addition to the legislation and duties discussed above the following key responsibilities are of note.



### Continued Asbestos Air Monitoring

The current status of the site in terms of potential human health risks from exposure to and inhalation of airborne asbestos fibres are based on a site study during which airborne asbestos fibre monitoring was undertaken. This has not indicated the release of asbestos fibres above the Control Limit.

Notwithstanding the above the Contractor should make provision for at least the following during the processing, stockpiling and placement of the legacy waste materials:

- Daily asbestos air monitoring for at least the first week whilst waste is disturbed;
- Further asbestos air monitoring at defined intervals (e.g. weekly or monthly) and the provision of interim monitoring reports to confirm asbestos human health risk status.

The Contractor will also undertake:

- Specific asbestos air monitoring if potentially more hazardous asbestos-containing materials are identified and that require removal from the waste as defined in the Asbestos Identification and Management Protocol.

### Personal Protective Equipment

The supply and use of PPE/RPE will be the responsibility of the Contractor and will be linked to the Contractor's own Method Statements and Risk Assessments. The following is produced as a guide only:

If moisture levels are maintained and dust suppressed, and on the basis of previous asbestos fibre air monitoring, there is unlikely to be the need for specific PPE or RPE at the site unless asbestos of a type that requires specific measures is identified as per the sections below. PPE for all Operatives and Contractors should comprise as a minimum the following:

- Steel toe capped and mid-soled boots;
- Hard hats; and
- High visibility clothing.

Operatives that are tasked with the removal of asbestos sheet materials to sealed containers should be equipped with the following additional PPE/RPE:

- Disposable overalls with hoods;
- Half face respirators with asbestos filters or P3 rated particle masks; and
- Safety spectacles (enclosed goggles not required).

Excavator drivers should remain within the cab of the vehicle with the windows shut at all times within the working area and will therefore only be required to wear "standard" site PPE unless otherwise determined by the Operator.

High visibility clothing will be worn while walking around the site, but will not be worn over the top of disposable overalls worn by Operatives engaged in asbestos sheet removal in the working area during the site works.

Used, disposable PPE (e.g. overalls and gloves) will be double-bagged, identified and disposed to a suitable facility along with any asbestos cement recovered.

PPE/RPE that should be worn by the SQP during the removal of small amounts of Type 2 asbestos is discussed in Section 4.5.6.

### Decontamination Facilities

It is currently not considered likely that formal decontamination facilities will be required unless Type 2 asbestos is later identified, however adequate welfare facilities should be provided for all Operatives and Contractors. The Contractor may wish to make provision for decontamination facilities at the start of the works in case Type 2 asbestos is later identified and requires removal.

### Asbestos Awareness and “Rumour Control”

The main aim of this document is to provide a protocol for the management of significant potential asbestos risks such that:

- Delays and costs associated with any asbestos-containing materials identified are kept to a minimum;
- Works will not be delayed by the presence of asbestos-containing materials unless there is an “actual” risk; BUT
- No site worker is put at risk unduly through indecision or a failure to provide mitigation of elevated potential asbestos risk.

The practical consequences of the above are as follows:

- All site staff (the Contractor and any sub-contractors) need to be aware of current levels of potential health risk associated with exposure to and inhalation of airborne asbestos fibres and that potentially significantly elevated risks might be present if increased concentrations and/or other forms of asbestos-containing materials are encountered on site;
- Key individuals (and ideally as many site staff involved in groundworks as reasonably possible) need to be able to make an informed decision as to whether any asbestos-containing materials encountered are very low or low risk (and works can continue without removal of ACMs) or whether the asbestos identified requires removal under additional precautions;
- In the case of the latter the Contractor need to appoint a specialist Suitably Qualified Person (SQP) to attend site and “mediate” the situation. It will be the SQP’s decision as to whether the asbestos identified requires removal;

From the above it is considered vital that the Contractor makes allowance for asbestos awareness training for all (or at least the majority) of ground workers and that duties associated with making decisions regarding asbestos are assigned.

## **4.4 Protocol for the Identification and Management of Asbestos Risk**

### **4.4.1 Introduction**

It is proposed that works proceed on the basis of currently known asbestos risks. No specific asbestos-related mitigation will be undertaken and waste processing works will commence on site, subject to relevant health and safety legislation.

It is therefore considered appropriate that the costs related to the asbestos management risk are included within the Contract, including any costs incurred for works carried out by a Licensed Asbestos Contractor (if it is demonstrated that this should be required). To minimise potential delays, it is suggested that a Licensed Asbestos Contractor be selected by the Contractor, but effectively held 'on stand-by' until such a time as any licensable work is required.

In order to state with confidence that potential health risks associated with asbestos-containing materials are low there is required to be a mechanism by which potential asbestos risk can be continually re-assessed and additional precautions taken as necessary. There are two methods by which potential asbestos risk is proposed to be monitored upon commencement of the works as follows:

- Regular asbestos air monitoring whilst waste is disturbed on site;
- A protocol to be applied if suspected/potential asbestos-containing materials are encountered on site – different actions (from no specific action to localised removal) to be undertaken based on asbestos-containing material type and quantity.

With respect to asbestos air monitoring, the Contractor will undertake routine asbestos air monitoring on a regular basis and provide a risk assessment update. This should not in addition however prevent the Contractor from undertaking further routine asbestos monitoring at his cost as is seen fit. Additionally, asbestos air monitoring will be undertaken by the Contractor whenever the nature of any asbestos-containing materials identified is warranted – as discussed later in this section.

The remainder of this section provides a protocol for both the identification of asbestos containing materials and a procedure for managing any significantly elevated health risks.

#### **4.4.2 Stage 1 – Asbestos Awareness Training**

Since the Asbestos Management and Monitoring Protocol initially relies on the visual identification of suspected/potential asbestos-containing materials, it is considered vital that a high proportion of site staff and at least key individuals (who should be available on site at very short notice) have undertaken at least basic asbestos awareness training.

The provision of asbestos awareness training will be to meet the following objectives:

- To manage perceived health risks associated with asbestos – typically perceived risks are higher than actual risks and standing time due to indecision or poor training should be avoided;
- To enable visual identification of suspected/potential asbestos-containing materials such that potential health risks can be reviewed;
- To enable any initial asbestos type assessment such that the type of action required can be judged.

Asbestos awareness training should be provided at the beginning of the project and periodically through the project to allow for staff changes. This should be included within the Contractor's contract price.

#### **4.4.3 Stage 2 – Notification/Recording**

All suspected potential asbestos-containing materials (regardless of type) should be noted immediately they are encountered. If encountered by a ground worker an immediate line manager or assigned personnel should be informed.

The type of suspected potential asbestos should be noted and the location it was encountered recorded on a plan. These details should pass from the sub-contractor to the Contractor and from the Contractor to the Client. Aside from any specific action required (as below) these records shall be held on site by all parties through the duration of the works.

#### **4.4.4 Stage 3 – Visual Identification**

Once suspected asbestos containing materials have been noted a Competent Person (i.e. a member of staff employed directly by the Contractor or sub-contractor, who has as a minimum completed an asbestos awareness course and is familiar with the site's history of asbestos assessment) will confirm on a visual basis that asbestos is potentially likely to be present within the material encountered.

#### **4.4.5 Stage 4 – Asbestos Type Assessment**

Following the above an SQP appointed by the Contractor will determine the type of asbestos present on a visual basis. The type of asbestos-containing material will determine the nature of any further action or mitigation as below.

Potential asbestos-containing material type will be documented by the SQP and recorded as one of two basic types as follows:

- Type 1 – asbestos contained within a firm matrix – this includes asbestos cement products, textured decorative coatings, asbestos paints and any item of bitumen, plastic, resin or rubber (e.g. vinyl floor tiles, electric cables, roofing felt).
- Type 2 – asbestos not contained within a firm matrix – for this project these are any asbestos containing materials not listed above, but particularly asbestos insulation (e.g. lagging materials) and asbestos insulating board (AIB).

From the above Type 1 asbestos materials will either require no action or practical steps to avoid cross-contamination. Type 2 asbestos materials (which have generally not been identified to date) will require removal.

It should be assumed that any suspected asbestos encountered contains asbestos fibres unless proven otherwise by a UKAS accredited laboratory.

#### **4.4.6 Stage 5 – Asbestos Risk Mitigation**

##### **Type 1 Asbestos Actions**

Where Type 1 asbestos containing materials (those within a firm matrix) are identified and confirmed, significantly elevated risks to site workers should not be present. These materials have a low propensity for asbestos fibre release and so present a low risk to human health.

It is anticipated that Type 1 asbestos products, if encountered, will be encountered as either:

- bituminised materials such as damp proof membrane; or

- Whole or partially damaged sheets of asbestos or large products which may contain asbestos (cabling, tiles etc); or
- Fragmented asbestos sheet distributed within the soil matrix.

Type 1 asbestos products may typically be addressed by a non-licensed contractor that has completed the appropriate training and complies with the relevant provisions of CAR 2012.

The procedure for managing potential health risks associated with the above are as follows:

#### Bituminised Materials

These materials should be removed to a sealed container i.e. a dedicated asbestos skip. It would be prudent to remove these materials to prevent further cross-contamination.

Works should continue following the above and the nature and location of the asbestos noted.

#### Sheets or Large Pieces of Asbestos Products

These materials should be dampened with mains quality water and removed as quickly as possible to a sealed container i.e. a dedicated asbestos skip. It would be prudent to remove these materials to prevent further cross-contamination.

Works should continue following the above and the nature and location of the asbestos noted.

#### Fragmented Asbestos (e.g. fragmented asbestos sheet)

In this case if the materials are randomly fragmented and distributed through the waste materials there is considered no value in attempting to remove them to a container since they will have already been disturbed. These materials can remain in legacy waste even when ultimately placed in visual screening bunds.

Where the above occurs the presence of the asbestos-containing materials should be noted and works resumed as soon as possible.

### **Type 2 Asbestos Actions**

#### Legal and Licensing Issues

Removal of all ACMs is regulated by CAR 2012.

All non-licensed work needs to be carried out with the appropriate controls in place.

For notifiable non-licensed work (NNLW), employers also have additional requirements to:

- notify work with asbestos to the relevant enforcing authority;
- ensure medical examinations are carried out; and
- maintain registers of work (health records).

Whether a type of asbestos work is either licensable, NNLW or non-licensed work has to be determined in each case and will depend on the type of work that is being planned, the type of material that is going to be worked on and its condition. The identification of the type of

ACM to be worked on and an assessment of its condition are important parts of the risk assessment, which needs to be completed before work is commenced.

Licensable work with asbestos is defined as work:

- where worker exposure to asbestos is not sporadic and of low intensity (infrequent periods of work done in a way that won't release high levels of asbestos fibres, i.e. by not using power tools); or
- where the risk assessment cannot clearly demonstrate that the control limit will not be exceeded i.e. 0.1 asbestos fibres per cubic centimetre of air (0.1 f/cm<sup>3</sup>); or
- on asbestos coating; or
- on asbestos lagging; or
- on asbestos insulation or asbestos insulating board where the risk assessment demonstrates that the work is not short duration work, e.g. when work with these materials will take no more than two hours in any seven day period, and no one person works for more than one hour in that two hour period.

Friable ACMs such as thermal insulation/lagging, insulating board and spray coatings, in most circumstances, will require removal upon by a Licensed Asbestos Removal Contractor under a plan of work subsequent to submission of a 14 day notification to the HSE.

Examples of NNLW include, (assuming in all cases exposure is sporadic and of low intensity and will not exceed the control limit):

- minor, short duration, work involving asbestos insulation, e.g. hand-picking small fragments of pipe insulation where the exterior coating has been broken or damaged;
- minor work involving AIB, when short duration, e.g. hand-picking small fragments of AIB;
- removal of asbestos paper and cardboard products if not firmly bonded in a matrix;
- removal of asbestos cement (AC) which is substantially degraded e.g. badly fire-damaged or de-laminated material, or where substantial breakage is unavoidable to achieve removal.

To be exempt from the requirement to have a licence the work must be:

- Sporadic and low intensity – to be considered sporadic and low intensity the concentration of asbestos in the air should not exceed 0.6f/cm<sup>3</sup> measured over 10 minutes; and
- Carried out in such a way that the exposure of workers to asbestos will not exceed the legal control limit of 0.1 asbestos fibres per cubic centimetre of air (0.1 f/cm<sup>3</sup>); and
- Meet at least one of four other conditions:
  - o It is a short non-continuous maintenance task, with only non-friable materials (friability describes how likely an ACM is to release asbestos fibres when worked on, so non-friable materials will only release a small number of fibres during work); or

- o It is a removal task, where the ACMs are in reasonable condition and are not being deliberately broken up, and the asbestos fibres are firmly contained within a matrix, e.g. the asbestos is coated, covered or contained within another material, such as cement, paint or plastic; or
- o It is a task where the ACMs are in good condition and are being sealed or encapsulated to ensure they are not easily damaged in the future; or
- o It is an air monitoring and control task to check fibre concentrations in the air, or it's the collection and analysis of asbestos samples to confirm the presence of asbestos in a material.

In order to ensure full compliance with the regulations, it is strongly recommended, however, that all materials that actually require removal are removed by a Licensed Asbestos Removal Contractor in accordance with "Managing and Working with Asbestos. Control of Asbestos Regulations 2012, Approved Code of Practice and Guidance, L143 (Second Edition)".

The appropriate notification should be served only in those circumstances that are prescribed by CAR 2012.

#### Small Amounts of Loose Asbestos

If the Contractor's SQP identifies Type 2 asbestos, work will cease in that area and ground workers will be deployed on another area of the site where possible.

The SQP will assess whether the asbestos identified is a small, isolated incidence or a larger pocket of material.

If only a small amount of loose fibre is identified this will be deemed by the SQP as suitable for removal into marked asbestos sampling bags, as if to be submitted to a UKAS accredited laboratory for analysis for example. In this situation the exercise may not be considered Licensable (although it is recommended that this approach is agreed with the HSE in advance of the works). The SQP will undertake the sampling of the asbestos while benefitting from appropriate RPE and PPE, which as a minimum will comprise;

- A professionally "face fitted" half face respirator with P3 rated air filters;
- Disposable overalls.

The SQP will remove the bagged asbestos to a suitable disposal container.

#### Larger Pockets of Loose Asbestos

As above, if the Contractor's SQP identifies Type 2 asbestos, work will cease in that area and ground workers will be deployed on another area of the site where possible

If the attending SQP considers that a volume of potential loose or fibrous asbestos may be present, the Contractor will arrange for the material to be removed by a Licensed Asbestos Removal Contractor, only following the preparation of a suitable and sufficient Plan of Work and submission of formal notification to the HSE as required by the CAR 2012.

On expiry of the statutory 14 day notification period, the asbestos will be removed by the Licensed Asbestos Removal Contractor under the relevant provisions of CAR 2012.

In the intervening period, all suspected/confirmed asbestos materials shall be covered and the area cordoned off and suitable warning signs erected to prohibit entry to the area.

During the removal works the Contractor will arrange for asbestos air monitoring around the perimeter of the working area to ensure the safety of workers at the site. The Contractor should make best endeavour to limit construction to a restricted area to be minimised and work shall continue in other areas of the site.

Once any removal works have been completed to the satisfaction of the SQP, works will resume in the impacted area.



## **5.0 CLOSURE**

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Council of the Isles of Scilly; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

## Drawings



## LEGEND

- C/L HT 2.0m
- Fence
- X Gate
- Tree
- ▨ Asbestos visible at surface level



19 HOLLINGWORTH COURT  
TURKEY MILL  
MAIDSTONE  
KENT  
ME14 5PP  
T: 01622 609242  
F: 01622 695872  
www.slrconsulting.com

Moorwell Waste Management Site  
Location of Asbestos Containing Materials

**DWG No. 1**

scale NTS

Date JUNE 2013

## Appendices

---

## **Appendix A – Waste Material Reuse Feasibility Study and Risk Assessment 2013**



global environmental solutions

Moorwell Waste Management Site, St Mary's, Isles of Scilly

Waste Material Reuse Feasibility Study  
And Risk Assessment

July 2013

Council of the Isles of Scilly



Version: Rev 2

## CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Terms of Reference .....	1
1.2	Background.....	1
1.3	Report Objective .....	3
1.4	Scope of Works.....	3
1.5	Report Format.....	4
<b>2.0</b>	<b>REVIEW OF PREVIOUS ASSESSMENTS .....</b>	<b>5</b>
2.1	SLR's Human Health and Environmental Risk Assessment, March 2009.....	5
2.2	SLR's Human Health and Environmental Risk Assessments Follow-on Site Investigation, December 2009.....	10
2.3	SLR's Isles of Scilly Monitoring Review, March 2011.....	12
<b>3.0</b>	<b>SLR SITE INVESTIGATION – APRIL 2013 .....</b>	<b>17</b>
3.1	Management of Contamination/Asbestos Risks.....	17
3.2	Investigation Scope of Works .....	18
3.3	Site Inspection .....	18
3.4	Trial Pits .....	18
3.5	Hand Excavated Pits.....	18
3.6	Waste Sampling .....	18
3.7	Groundwater Sampling .....	19
3.8	Laboratory Analysis .....	19
<b>4.0</b>	<b>RESULTS .....</b>	<b>20</b>
4.1	Ground Conditions .....	20
4.2	Evidence of Contamination.....	29
4.3	Asbestos .....	29
4.4	Asbestos Air Monitoring Results.....	32
4.5	Waste Sampling Analytical Results.....	33
4.6	Waste Sampling Asbestos Results .....	37
4.7	Leachability Analysis .....	39
4.8	Groundwater Results.....	40
<b>5.0</b>	<b>CONCEPTUAL MODEL.....</b>	<b>42</b>
<b>6.0</b>	<b>GENERIC QUANTITATIVE RISK ASSESSMENT .....</b>	<b>44</b>
6.1	Human Health Risk Assessment .....	44
6.2	Controlled Waters Risk Assessment.....	44
6.3	PPL 1 - Soils Risks to Human Health Other than Asbestos .....	45
6.4	PPL 2 - Soil Impacts to New Services.....	49
6.5	PPL 4 – Impact to Controlled Waters.....	49
6.6	PPL 1 and 3 - Asbestos Risk Assessment .....	51
<b>7.0</b>	<b>WASTE CLASSIFICATION .....</b>	<b>55</b>
<b>8.0</b>	<b>CONCLUSIONS AND MATERIAL REUSE POTENTIAL.....</b>	<b>56</b>
8.1	Assessment Summary .....	56
8.2	Reuse Potential and Recommendations .....	57

## TABLES

Table 1 – Waste Stockpile Volumes 2011.....	1
Table 2 – Waste Stockpile Volumes 2013.....	2
Table 3 – Moorwell Aquifer Characteristics .....	5
Table 4 - Water Quality Monitoring Results for Detected List I Substances (2009).....	6
Table 5 - Water Quality Monitoring Results for Detected List II Substances (2009).....	7
Table 6 – Gas Screening Results.....	9
Table 7 - Summary of Groundwater Quality Results for BH's J, K, L and M 2009.....	15
Table 8 - Gas Survey Results 2009 .....	16

<b>Table 9 – Ash Waste Metals and Inorganics .....</b>	<b>33</b>
<b>Table 10 – Ash Waste PAHs and Petroleum Hydrocarbons.....</b>	<b>33</b>
<b>Table 11 – Soil/Green Waste Metals and Inorganics .....</b>	<b>34</b>
<b>Table 12 – Soil/Green Waste PAHs and Petroleum Hydrocarbons.....</b>	<b>34</b>
<b>Table 13 – Mixed Waste Metals and Inorganics .....</b>	<b>35</b>
<b>Table 14 – Mixed Waste PAHs and Petroleum Hydrocarbons .....</b>	<b>35</b>
<b>Table 15 – C&amp;D Waste Metals and Inorganics .....</b>	<b>36</b>
<b>Table 16 – C&amp;D Waste PAHs and Petroleum Hydrocarbons.....</b>	<b>36</b>
<b>Table 17 – Asbestos Screen Results .....</b>	<b>37</b>
<b>Table 18 – Asbestos Quantification Results .....</b>	<b>38</b>
<b>Table 19 – Leachability Analysis Results.....</b>	<b>39</b>
<b>Table 20 – Groundwater Analysis Results .....</b>	<b>40</b>
<b>Table 21 – Conceptual Model .....</b>	<b>42</b>
<b>Table 22 – Generic Risk Assessment – Ash Waste Metals .....</b>	<b>46</b>
<b>Table 23 - Generic Risk Assessment – Ash Waste PAHs and Petroleum Hydrocarbons .....</b>	<b>46</b>
<b>Table 24 - Generic Risk Assessment – Soil/Green Waste Metals .....</b>	<b>46</b>
<b>Table 25 - Generic Risk Assessment – Soil/Green Waste PAHs and Petroleum Hydrocarbons .....</b>	<b>47</b>
<b>Table 26 - Generic Risk Assessment – Mixed Waste Metals.....</b>	<b>47</b>
<b>Table 27 - Generic Risk Assessment – Mixed Waste PAHs and Petroleum Hydrocarbons .....</b>	<b>48</b>
<b>Table 28 - Generic Risk Assessment – C&amp;D Waste Metals .....</b>	<b>48</b>
<b>Table 29 - Generic Risk Assessment – C&amp;D Waste PAHs and Petroleum Hydrocarbons .....</b>	<b>48</b>
<b>Table 30 – Generic Risk Assessment - Groundwater .....</b>	<b>50</b>

## FIGURES

<b>Figure 1 – Comparison of 2011 and 2013 Waste Volumes .....</b>	<b>2</b>
<b>Figure 2 – Possible Site Layout Following Redevelopment.....</b>	<b>56</b>

## DRAWINGS

<b>Drawing 1</b>	<b>Location of Asbestos Containing Materials</b>
<b>Drawing 2</b>	<b>Trial Pit Location Plan</b>

## APPENDICES

<b>Appendix A</b>	<b>Trial Pit Logs</b>
<b>Appendix B</b>	<b>Laboratory Analysis – Soils</b>
<b>Appendix C</b>	<b>Asbestos Air Monitoring Results</b>
<b>Appendix D</b>	<b>Laboratory Analysis – Groundwater</b>
<b>Appendix E</b>	<b>Generic Assessment Criteria</b>
<b>Appendix F</b>	<b>Waste Classification Results</b>



## 1.0 INTRODUCTION

### 1.1 Terms of Reference

This report describes a site investigation undertaken in relation to materials currently stockpiled at the Moorwell Waste Management Site (WMS) as part of an assessment to determine the feasibility of reuse of part, or all, of the material within future development at the Site.

The assessment has been carried out by SLR Consulting Limited (SLR) on behalf of the Council of the Isles of Scilly (CioS).

### 1.2 Background

#### 1.2.1 Existing Stockpiled Waste Materials

Prior to seeking Planning Consent for, and ultimately developing, a new waste facility at Moorwell there is a requirement to address existing site legacy waste issues.

For a number of years waste materials have been accepted to the site. In some cases waste materials (e.g. domestic waste, cardboard, certain bulky wastes) are used as feedstock for an incinerator. Other wastes (e.g. glass, metal and other recyclables) are temporarily stored on site and sent for mainland disposal/recycling on a campaign basis.

Waste materials such as soil/green waste and construction and demolition (C&D) waste have historically had no onwards disposal route and have increased in volume on an annual basis as a result. Incinerator bottom ash (IBA) has also accumulated at the site.

In 2011 a survey of the site indicated the following volumes of material to be present at the site:

**Table 1 – Waste Stockpile Volumes 2011**

<b>Waste Type</b>	<b>Estimated Volume</b>
Glass	108m3
Soil Waste	1,580m3
C&D Waste	2,206m3
Domestic Waste	2,336m3
Bulky waste	3,283m3
Soil/Green Waste	6,069m3
Ash Waste	14,664m3
Metals	Unknown

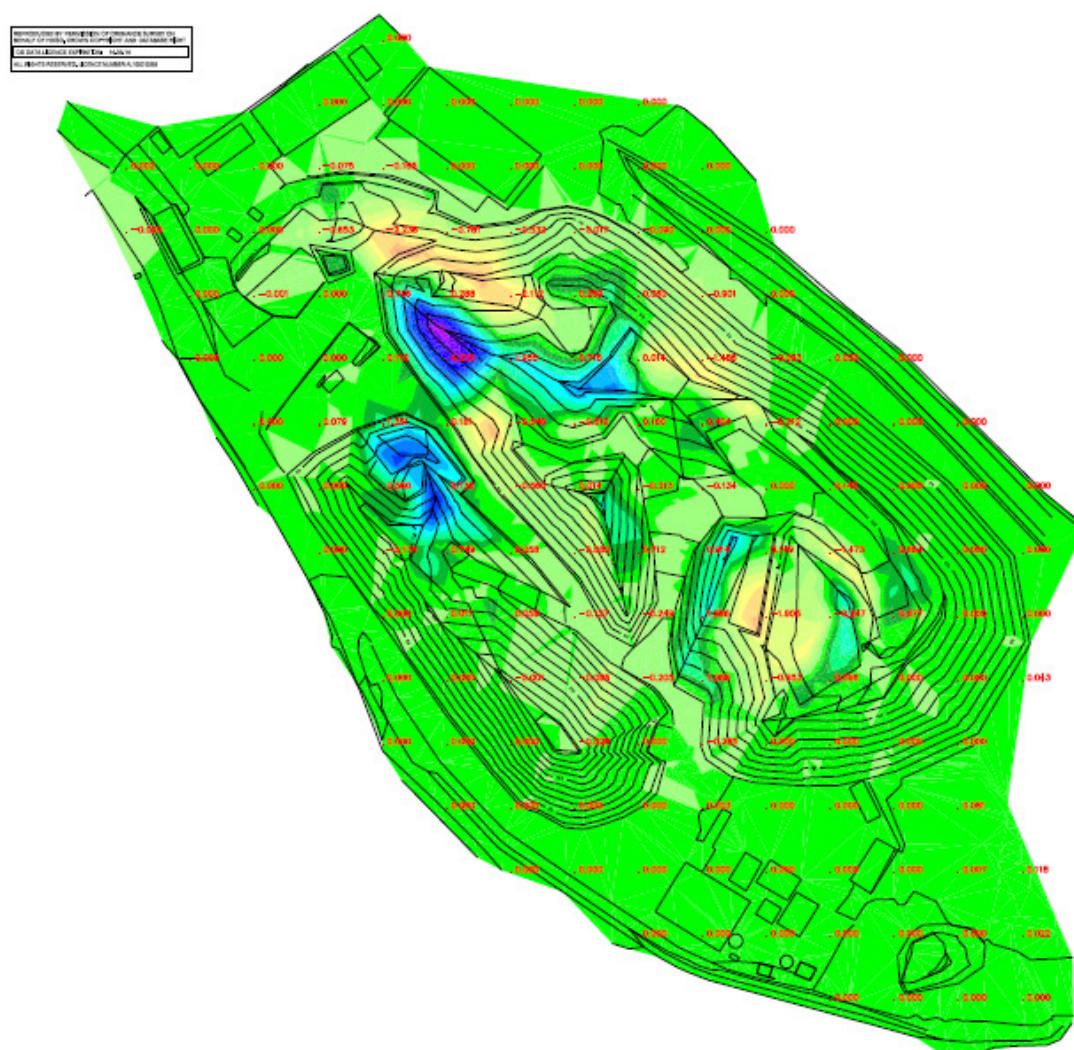
In early 2013 a revised survey of the site was undertaken. This survey had difficulty in distinguishing some of the above specific waste types (due to a back-log of domestic and bulky waste) and indicated an overall increase in waste volumes as shown in Table 2.

**Table 2 – Waste Stockpile Volumes 2013**

Waste Type	Estimated Volume
Ash and General Waste	23,205m <sup>3</sup>
Soil/Green Waste	6,303m <sup>3</sup>
Loose Vegetation 1	173m <sup>3</sup>
Loose Vegetation 2	12m <sup>3</sup>
Hardcore Stockpile	100m <sup>3</sup>

Notwithstanding the above, the overall increase in waste material volumes was estimated at less than 1000m<sup>3</sup> in a two-year period. In terms of the height of material stockpiles this meant that only materials coloured blue in Figure 1 below were above that observed in 2011. The relatively small increase in waste material volumes within this period of time is due to continued operation of the incinerator for suitable materials, the removal of recyclable materials to the mainland and the processing and off-site reuse of some C&D waste.

**Figure 1 – Comparison of 2011 and 2013 Waste Volumes**



### **1.2.2 Waste Material Reuse Options**

A variety of on and off-site reuse/recovery options are likely to be available for waste materials currently stockpiled at Moorwell. We note however, that any future development of the Moorwell WMS will result in a requirement for visual screening bunds. On this basis, prior to consideration of off-site (or off-island) reuse options, consideration has been given to which materials might be suitable for bund construction or other engineering tasks. The reuse of materials already located at Moorwell will reduce the requirement for the import of raw resources to the site and will ultimately result in a lower landfill burden.

Currently it is believed that, subject to proving “suitability for use” on an environmental and geotechnical basis, the following reuse options may be available at Moorwell as part of future development subject to Planning Consent and a suitable Environmental Permit:

- Incinerator bottom ash – could be suitable for the construction of bunds. A re-grading of existing bunds may also be possible in some areas to prevent unnecessary excavation;
- Soil/green waste – could be suitable to form a growing medium over the ash bund; and
- C&D waste – hard materials could be suitable for production of secondary aggregates for use in site construction projects. Fine (soil) material could be suitable as soil forming materials over ash bunds.

The purpose of this assessment is to provide evidence in support of the reuse of the above materials by proving that the material will not result in harm to human health or the environment if it was to be retained at the site in the long-term. Materials with existing disposal routes (recyclable materials, bulky waste, domestic waste) are not considered by this study.

### **1.3 Report Objective**

SLR has previously undertaken assessments at the site in relation to the potential risks posed by stockpiled materials. These assessments (dated March 2009 and December 2009) concentrated on risks to Controlled Waters and via the migration of landfill gases and concluded that a high level of risk is not likely to be present. At a practical level these assessments indicate that the site is not causing significant pollution and therefore that the reuse of material already present is plausible. The purpose of this report is to consider the suitability of the materials for re-use at Moorwell more directly and as such considers predominantly human health risks, including risks associated with the potential presence of asbestos containing materials (ACMs).

At the request of the Environment Agency a single round of groundwater monitoring has also been undertaken from three monitoring wells located between the stockpiled material and adjacent Site of Special Scientific Interest (SSSI). The results have been compared to those reported in 2009 to assess whether groundwater quality has improved or deteriorated since this time.

### **1.4 Scope of Works**

The scope of works for the assessment was as follows:

1. Manage health and safety risks associated with the potential presence of ACMs;
2. Excavate trial pits from which to visually assess waste materials and obtain representative samples;

3. Undertake on site testing of samples for the presence of volatile organic compounds (VOCs);
4. Recover sub-samples for laboratory analysis of a range of contaminants with potential to be present in waste materials;
5. Undertake groundwater sampling from existing wells;
6. Determine risks to human health by comparison of laboratory analysis to Generic Assessment Criteria (GAC);
7. Compare groundwater analysis to previous results, relevant Environmental Quality Standards (EQS) and Drinking Water Standards (DWS); and
8. Discuss risks associated with asbestos and practical management of asbestos containing materials.

## **1.5 Report Format**

Section 2 summarises previous reports and assessments completed for the site. Section 3 presents the methodology for the site investigation and Section 4 summarises the results. Section 5 presents a conceptual model for the site and Section 6 provides a generic quantitative risk assessment. Section 7 presents the results of a waste classification of materials currently stockpiled at the site.

## 2.0 REVIEW OF PREVIOUS ASSESSMENTS

### 2.1 SLR's Human Health and Environmental Risk Assessment, March 2009

#### 2.1.1 Report Purpose

This study was commissioned by the Environment Agency (EA) and its purpose was to:

- A. Undertake an initial phase of work to determine the environmental and human health risks associated with the existing landfill operation at Moorwell; and
- B. Undertake a further expanded assessment of the risks specifically posed by the Moorwell Landfill to Joaney's Well, given the use of this well to help meet the potable water supply requirements of the population of St Mary's.

#### 2.1.2 Information Sources

In addition to site visits and monitoring undertaken by SLR the report made use of numerous reports produced by other consultants, Ordnance Survey maps, EA data, pumping records for a local abstraction well (Joaney's Well) and a report supplied by the South West Water Authority.

#### 2.1.3 Desk Study Information

##### Geology

The bedrock of the island comprises granite, which is overlain by superficial deposits that can be divided into three categories as follows:

- Blown Sand: localised thin deposits of fine grained wind blown sand.
- Alluvium: comprising grey to brown organic silty clays, with occasional thin sandy layers, and typically ranging in thickness from 3 to 4m.
- Glacial Deposits: locally referred to as Ram, these deposits are typically present above the weathered granite bedrock in the upland areas and on some hillslopes.

##### Hydrogeology

Aquifer characteristics are summarised in Table 3 below. In terms of groundwater flow directions below the Lower Moors, these are either north-westward toward the sea at Porth Mellon, or south-eastward toward the coast at Old Town Bay. At the coast the freshwater discharges to the sea.

**Table 3 – Moorwell Aquifer Characteristics**

Geological Unit	Characteristics
Alluvium	<ul style="list-style-type: none"><li>– Effectively acts as an aquitard, due to relatively low vertical hydraulic conductivity given the silty clay dominated grain size.</li><li>– Typically 3 to 4m thick.</li><li>– Horizontal permeability may be enhanced by occasional interbedded sand layers, although bulk permeability expected to be <math>&lt; 1 \times 10^{-6} \text{m/s}</math> given likely limited lateral and localised extent of these sand horizons.</li><li>– High organic carbon content especially in the uppermost horizons (due to</li></ul>

Geological Unit	Characteristics
	depositional environment and previous vegetation growth – roots etc) should provide significant retardation and degradation of potential contaminants migrating slowly through the alluvium.
	– Localised presence of windows of enhanced permeability allowing increased vertical leakage through the alluvium aquitard, as identified at one drilling location near Joaney's Well (see text in Section 2.4).
Glacial Deposits	<ul style="list-style-type: none"> <li>– Represents the main aquifer that is confined by the overlying alluvium aquitard.</li> <li>– Up to 2m thick.</li> <li>– Previous estimates of permeability range between <math>1 \times 10^{-5}</math> to <math>3 \times 10^{-4}</math> m/s, reflecting its sand and gravel dominated composition.</li> <li>– Pumping tests completed on Joaney's Well (thought to tap this aquifer) on a number of previous occasions have given permeability estimates ranging between <math>5 \times 10^{-4}</math> m/s and <math>8 \times 10^{-4}</math> m/s (assuming a saturated aquifer thickness of 1m).</li> <li>– A short term pumping test completed by SLR during February 2009, with pumping from BH K, gave a permeability of c. <math>1 \times 10^{-4}</math> m/s.</li> </ul>
Granite	<ul style="list-style-type: none"> <li>– The uppermost 0.3 to 0.7m of granite is weathered and so is more permeable than the fresh underlying granite.</li> <li>– Relatively low permeability compared to the overlying glacial deposits.</li> <li>– Able to support small abstractions.</li> </ul>

### 2.1.4 Groundwater Quality

In February 2009 the EA collected groundwater samples for the glacial deposits groundwater monitoring boreholes located around the perimeter of Moorwell (boreholes BHJ, BHK, BHL, and BHM and Old Moor Well). The results are summarised in Tables 4 and 5 for List I and II substances. Comparison of the results, with regard to DWS (Drinking Water Standards), EQS (freshwater Environmental Quality Standards), MRVs (Minimum Reporting Values) and WHO (World health Organisation) standards, indicated the following:

- Groundwater quality from boreholes BHK and BHL had elevated ammonia (as N), arsenic, chloride, iron, manganese and sodium concentrations;
- BHL groundwater also had List I substances tetrachloroethene, trichloroethene and 1,2-dichloroethane concentrations that were elevated above minimum reporting values (MRVs);
- BHM groundwater had elevated iron, manganese and mercury concentrations, while BHJ had elevated arsenic, chromium, copper and lead; and
- The Old Moor well had slightly elevated arsenic, iron and manganese concentrations.

**Table 4 - Water Quality Monitoring Results for Detected List I Substances (2009)**

Parameter	Sampled Date	Units	DWS	EQS (freshwater)	MRV	Landfill BH J	Landfill BH K	Landfill BH L	Landfill BH M	Old Moor Well
						Groundwater				
CHLOROXURON (herbicide)	12 <sup>th</sup> February 2009	ug/l	0.1	n/a	n/a	<0.04	<0.04	0.084	<0.04	<0.04
MCPB (herbicide)		ug/l	0.1	n/a	n/a	<0.04	<0.042	0.045	<0.04	<0.04
PROPAZINE (herbicide)		ug/l	0.1	n/a	n/a	<0.04	<0.042	0.045	<0.04	<0.04
1,2-DIMETHYL-BENZENE {O-XYLENE}		ug/l	10	30	3	<0.1	<0.1	0.113	0.161	<0.1
M, P- XYLENE		ug/l	10	30	3	<0.2	<0.2	<0.2	0.22	<0.2

CADMIUM - AS CD		ug/l	5	5	1	4.39	<0.1	<1	0.11	<0.1
MERCURY - AS HG		ug/l	1	1	0.1	0.077	<0.01	<0.01	<b>0.283</b>	<0.01
ATRAZINE	17 <sup>th</sup> March 2006	ug/l	0.1	2	0.03	0.008	<0.001	<0.001	<0.001	Not sampled
CADMIUM - AS CD		ug/l	5	5	1	0.45	<0.1	<0.1	0.32	
MERCURY - AS HG		ug/l	1	1	0.1	0.05	<0.01	<0.01	0.05	
TETRACHLORO-ETHENE		ug/l	10	10	0.1	<0.1	<0.1	<b>3.1</b>	<0.1	
TRICHLOROETHENE		ug/l	10	10	0.1	<0.1	<0.1	<b>0.927</b>	<0.1	
1,2-DICHLORO-ETHANE		ug/l	3	10	1	<1	<1	<b>1.48</b>	<1	
BENZENE		ug/l	1	30	1	<0.1	<0.1	0.264	<0.1	

**Table 5 - Water Quality Monitoring Results for Detected List II Substances (2009)**

Parameter	Units	DWS	EQS (freshwater)	WHO (Health)	Landfill BH J	Landfill BH K	Landfill BH L	Landfill BH M	Old Moor Well
					Groundwater				
Ammonia ( N )	mg/l	0.39	0.015	-	<0.03	<b>0.474</b>	<b>0.528</b>	0.0411	0.0847
Arsenic	ug/l	10	50	10	<b>26.9</b>	<b>105</b>	<b>279</b>	8.31	<b>15</b>
Chloride	mg/l	250	250	-	144	<b>385</b>	<b>462</b>	153	151
Chromium	ug/l	50	10 - 200	50	<b>16.6</b>	0.807	5.78	3.48	0.85
Copper	ug/l	2000	6 - 10	2000	<b>218</b>	1.34	13.7	3.69	6.41
Iron (Diss)	ug/l	200	1000	-	68	<b>17100</b>	<b>59300</b>	<b>2540</b>	<b>207</b>
Lead	ug/l	25	10-250	10	<b>265</b>	0.608	7.88	2.22	2.14
Manganese (Diss)	ug/l	50	-	500	40.5	<b>474</b>	<b>610</b>	<b>227</b>	<b>87.5</b>
Sodium (Diss)	mg/l	200	170	-	98.6	<b>209</b>	<b>331</b>	120	99.7
Ammonia ( N )	mg/l	0.39	0.015	-	<0.03	<b>0.451</b>	<b>0.573</b>	<0.03	Not sampled
Arsenic (Diss)	ug/l	10	50	10	n/a	n/a	n/a	n/a	
Chloride	mg/l	250	250	-	132	<b>424</b>	<b>545</b>	202	
Chromium	ug/l	50	10 - 200	50	4.8	<0.5	1.2	<0.5	
Copper (Diss)	ug/l	2000	6 - 10	2000	<b>14</b>	<1	2.2	3.2	
Iron (Diss)	ug/l	200	1000	-	988	<b>16900</b>	<b>55600</b>	<b>1650</b>	
Lead	ug/l	25	10-250	10	<b>17.6</b>	<2	<2	<2	
Manganese (Diss)	ug/l	50	-	500	48	<b>509</b>	<b>688</b>	<b>162</b>	
Sodium (Diss)	mg/l	200	170	-	89.8	<b>212</b>	<b>230</b>	134	

### 2.1.5 Conceptual Hydrogeological Site Model

Based on the available historical hydrogeological information and water quality data presented in the 2009 report, the conceptual hydrogeological model for Moorwell Landfill and Lower Moors area including Joaney's Well, was summarised with the following 'source – pathway – target/ receptor' scenario:

### Source

- Moorwell Landfill is a land-raise site that is operated on the principle of dilute and attenuate, and with no engineered containment. Landfilling at the site started in 1965, with the waste tipped directly onto the Lower Moors;
- Domestic, commercial and industrial wastes are accepted at the site, including garden, farm and inert waste (demolition materials, rubble and glass). The maximum depth of waste, including the green waste and incinerator ash disposal areas, is estimated to be up to c.8m in places;
- It is understood that historically much of the combustible waste was typically burnt at the site; however, since 1978 the waste has been incinerated, with the incinerator ash then being landfilled at the site;
- Available information together with observations during the SLR site visits indicate that only partial combustion of the wastes has been achieved on occasions in the past;
- Leaching test results on samples of the incinerator ash waste from the site using deionised water indicate an initial high Total Organic Carbon (TOC) confirming the presence of unburned degradable organic material in the incinerator residues;
- Elevated concentrations of List II substances, including ammonia, chloride, sulphate and metals (arsenic, antimony, chromium, nickel, copper, zinc, iron, manganese and lead) are also present;
- List I substances including industrial solvents, herbicides, PAH's (naphthalene and acenaphthene) and heavy metals (cadmium and mercury) are likely to be present within the leachate, albeit at relatively low concentrations; and
- These leaching test results suggest that leachate that is generated by precipitation percolating through the uncapped wastes at the Moorwell Landfill site is representative of that from aged non-hazardous wastes.

### Pathways

- The majority of the landfill waste at Moorwell Landfill site is likely to be located on 1 to 2m of alluvium, with low permeability characteristics due to the silt and clay dominated grain size of the alluvium;
- The upper horizon of the alluvium is likely to be very organic rich, given the presence of wetland vegetation across this part of the Lower Moors prior to the start of landfilling at the site;
- The high organic carbon content and low permeability of the alluvium should help to minimise and slow down leachate migration through the alluvium and into the underlying glacial deposits aquifer, as a result of retardation of metallic elements, and retardation and biodegradation of organic List I substances (including hydrocarbons, herbicides and pesticides);
- There may be localised pathways through the alluvium, possibly associated with building foundations and services in the immediate vicinity of the site, that allow relatively rapid leachate migration down into the glacial deposits groundwater system below the landfill site; and
- As there is no sidewall containment around the perimeter of the landfill, leachate and contaminated surface water runoff from the landfill are able to migrate laterally into the drainage ditches that run along the eastern and south-eastern perimeters of the landfill site and which form the upper reaches of the Lower Moors drainage system.

### Receptors

- The primary receptors for any leachate that is able to migrate from the Moorwell Landfill site are:



- The groundwater system within the glacial deposits aquifer that underlies the Lower Moors area; and
- The Lower Moors surface water drainage system, which ultimately drains to Old Town Bay;
- The glacial deposits aquifer is utilised by Joaney's Well, located approximately 400m to the east of the landfill boundary on the opposite side of the Lower Moors and so this public water supply well is also considered to be a potential receptor; and
- There are no other potable groundwater abstractions in the vicinity of the site, and the old Moor Well, old round and square incinerator wells are disused.

### 2.1.6 Gas Risk Screening

An initial gas screening survey was completed in February 2009, using a hand held GA2000 portable gas metre supplied by Geotechnical Instruments Limited. The results, recreated in Table 6 below, indicated that the current level of risk presented by the landfill with regard to potential landfill gas can be assessed as 'low'.

**Table 6 – Gas Screening Results**

Location	Position (Locations in the immediate vicinity of the landfill and incinerator are shown on Drawing No. 2)	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Barometric Pressure (mb)
Surface water drains in workshop and garage area of Landfill Site	Location 1: Middle of yard in front of garages	0	0.1	19.5	1028
	Location 2: Rainwater drain at corner of garage	0	0.1	19.5	1028
Road drains in industrial estate to immediate north of Landfill Site	SU 90929 10698	0	0.1	20.7	1028
	SU 90873 10653	0	0.1	21	1028
Road drains on Jacksons Hill (residential lane leading off Landfill access road (Moor Well Lane))	SU 90800 10650	0	0.1	20.7	1028
	SU 90815 10579	0	0.1	20.9	1028
Road drains in residential area on lane (Pilot's Retreat) running off Church Road and overlooking landfill site	SU 90893 10421	0	0.1	21.1	1028
	SU 90837 10460	0	0.1	21.1	1028
BH J	Perimeter groundwater boreholes wells around Moorwell Landfill	0	0.1	20.9	1027
BH K		0	0.1	21.0	1028
BH L		0	0.1	20.7	1028
BH M		0	0.1	20.7	1028
Old Moor Well		0	0.1	20.7	1028
Old Round Incinerator Well		0	0.1	20.9	1028
Old Square Incinerator Well		0	0.2	20.9	1027
Surface water drains on concrete pad surrounding incinerator	Location 3: SU 90961 10507	0	0	20.9	1028
	Location 4: SU 90971 10519	0	0.1	20.9	1027
	Location 5: SU 90959 10518	0	0.1	21.1	1027

### 2.1.7 Key Risk Assessment Outputs and Conclusions

Based on the available information reviewed in 2009, the overall risk presented by the Moorwell site to human health and the adjacent groundwater and surface water environments under current conditions was considered to be near zero to low. However,

given the sensitive site setting the following key conclusions and recommendations were provided:

#### Surface Water

- The monitoring data for March 2006 and 2009 suggested that the surface water quality within the Lower Moors drainage system downstream of the landfill site was not significantly impacted by either List I or II substances derived from landfill leachate; and
- Further surface water quality sampling was recommended during the summer and the risk assessment reviewed to confirm that the level of risk to surface water was unchanged under low rainfall conditions.

#### Groundwater

- The available hydrogeological monitoring data confirmed that groundwater quality in the glacial deposits aquifer at the down-gradient (north-eastern) perimeter of the landfill was impacted by leachate leakage from the Moorwell site;
- Under the abstraction regime over recent years for Joaney's Well, the cone of influence due to the periodic abstraction from this well was considered very unlikely to extend as far as Moorwell, except possibly on rare occasions when pumping duration is increased significantly;
- A groundwater monitoring programme was recommended for the perimeter groundwater monitoring boreholes along with a new monitoring location(s) on the Lower Moors between the landfill site and Joaney's Well; and
- Further investigations were recommended in order to better define the risks to Joaney's Well from the Moorwell site.

#### Landfill Gas & APC Residues

- The site setting, landfill design and waste inputs at the site suggested that the risk posed from any landfill gas that may be generated at the site was low.

## **2.2 SLR's Human Health and Environmental Risk Assessments Follow-on Site Investigation, December 2009**

### **2.2.1 Report Purpose**

The report was commissioned by the DEFRA and the EA to complete follow-on hydrogeological site investigations in the vicinities of the Moorwell Landfill Site on St Mary's, and the historic landfill sites located on the off-islands of Bryher, St Martin's and St Agnes.

The scope of works was based on recommendations made by the March 2009 investigation as summarised above.

### **2.2.2 Moorwell Scope of Works**

The scope of works included the following:

- Repeat groundwater and surface water sampling was completed between 2<sup>nd</sup> and 5<sup>th</sup> September 2009;
- Drilling and installations of additional boreholes were completed in September and October 2009;
- A gas monitoring programme was completed in October 2009; and

- A 72 hour constant rate pumping test, immediately followed by a recovery test, was carried out in Joaney's Well.

### **2.2.3 Results of Groundwater Sampling from the Moorwell Boreholes**

- Groundwater quality in boreholes BHJ, BHK, and BHM was slightly impacted by leachate from Moorwell Landfill site, as indicated by ammoniacal nitrogen, chloride, sodium, arsenic, lead, iron and manganese concentrations that failed to meet UK DWS. The elevated metal concentrations were considered very likely to reflect the relatively acidic pH, which also did not meet UK DWS;
- Chloride, sodium, ammoniacal nitrogen and manganese concentrations had not changed significantly between February and September 2009. This suggested that seasonal recharge affects were limited;
- A number of hazardous (List I) substances were detected in boreholes BHK, BHL and BHM, although within the UK DWS;
- Non-hazardous (List II and general) substances that exceeded UK DWS, and hazardous (List I) substances that had been detected are summarised in Table 7, below;
- Substances tentatively identified within the sample taken from BHJ on 3<sup>rd</sup> September 2009 were simazine (0.01ug/l approx.), di-n-butyl phthalate (6ug/l approx.) and bisphenol A (0.34ug/l approx.);
- Substances tentatively identified within the sample taken from BHK on 2<sup>nd</sup> September 2009 were sec-butylbenzene (0.02ug/l approx.) and benzophenone (0.07ug/l approx.);
- The only substance tentatively identified within the sample taken from the BHL on 2<sup>nd</sup> September 2009 was bisphenol A (0.07ug/l approx.); and
- There were no tentatively identified substances within sample from BHM, for 2<sup>nd</sup> September 2009.

### **2.2.4 Gas Monitoring Programme**

The gas monitoring results obtained in 2009 are summarised in Table 8. The results did not indicate significant concentrations of methane, with all results (steady and peak) equal or less than 0.3%.

The in-waste monitoring boreholes gave very low (0.1% or lower) methane concentrations, suggesting that the waste mass is unlikely to be producing significant volumes and concentrations of methane.

### **2.2.5 Moorwell Conclusions**

- Groundwater quality in the glacial deposits aquifer on the eastern (down-gradient) perimeter of the landfill site continued to be slightly impacted by leachate. Ammoniacal nitrogen, chloride, sodium arsenic, lead, iron and manganese concentrations failed to meet UK DWS. A number of hazardous (List I) substances were detected in boreholes BHK, BHL and BHM, although within the UK DWS. Comparison of groundwater quality results for February and September 2009 suggested that seasonal recharge affects were limited;
- Groundwater quality in the old large diameter wells located in the immediate vicinity and up-gradient of Moorwell typically met UK DWS, with the exceptions of iron, manganese and nitrate. Mercury, cadmium and tetrachloroethene were also detected on occasions, although well within UK DWS;

- Comparison of groundwater quality results for February and September 2009 for all wells suggested that seasonal recharge affects on the groundwater quality of the underlying glacial deposits aquifer were limited; and
- The gas monitoring results did not indicate significant concentrations of methane, either within the waste or around the northern and western perimeters of the landfill with all results (steady and peak) equal or less than 0.3%. This was thought to reflect the dominant ash waste stream.

## **2.2.6 Recommendations**

The following key recommendations were provided:

### **Moorwell Landfill and Lower Moors Groundwater and Surface Water Monitoring Programme**

#### *Objectives:*

- assess the ongoing impact of the Moorwell Landfill site on the groundwater and surface water quality of the Lower Moors and Joaney's Well;
- confirm groundwater quality at the new Lower Moors groundwater monitoring borehole (LM GW1/09) and provide an early warning to any potential contamination of Joaney's Well; and
- provide a baseline that extends throughout the year against which any future developments at the Moorwell Landfill site and risks to Joaney's Well can be assessed.

### **Moorwell Landfill Site Gas Monitoring**

#### *Objectives:*

- confirm that gas concentrations remain low throughout the year and under different climatic conditions.

## **2.3 SLR's Isles of Scilly Monitoring Review, March 2011**

### **2.3.1 Report Purpose**

The Environment Agency undertook additional groundwater and gas monitoring in March 2010 following recommendations made by SLR, as summarised above. In March 2011 SLR summarised this data in an addendum report.

### **2.3.2 Groundwater Data**

#### **Aunt Joaney's Well**

There was very little difference between the March 2010 data and the 2009 monitoring data at Aunt Joaney's Well. The only determinand with a greater maximum concentration than seen previously was zinc, with a new maximum of 14.9ug/l when compared to the previous maximum of 10.6ug/l. This concentration was still below the old UK DWS of 5mg/l and below the new 2010 Environmental Quality Standard<sup>1</sup> (EQS) of 75ug/l (dependant on the hardness of the water – within the 100-250mg/l CaCO<sub>3</sub> range).

---

<sup>1</sup> Environment Agency, 2010. H1 Environmental Risk Assessment – Annex (d). GEHO0810BSXL-E-E.

### Lower Moors Borehole (LM GW1/09)

The March 2010 data showed marked decreases in lead, chromium, manganese and copper, when compared to previous monitoring data, with manganese showing the greatest decrease (3910ug/l 6<sup>th</sup> October 2009 and 306ug/l 1<sup>st</sup> March 2010).

The pH had also decreased over the monitoring period from 6.51 (6<sup>th</sup> October 2009) to 5.96 (1<sup>st</sup> March 2010).

The March 2010 chloride concentration remained elevated (314mg/l) similar to previous concentrations, and the ammonia concentration remained low, as previously, at 0.03mg/l.

Given that the monitoring location had only been sampled in October 2009 and March 2010, it was not clear whether the decrease in the concentrations of these parameters was a seasonal trend and whether these concentrations may rise again. Further monitoring was therefore recommended in order to investigate the significance and reproducibility of the results.

### Old Round Incinerator Well

The March 2010 data showed decreases in lead, chromium, manganese and copper, again with manganese showing the greatest decrease (232ug/l 5<sup>th</sup> September 2009 to 12.9ug/l 1<sup>st</sup> March 2010).

Chloride and ammonia concentrations from March 2010 remained similar to previous monitoring data.

### Moorwell Landfill Groundwater Monitoring Boreholes (K & L)

Borehole K showed very little change between the March 2010 data and the 2009 monitoring data. Ammonia and chloride concentrations (0.449mg/l and 362mg/l respectively) remained at similarly elevated levels to previous data.

Borehole L showed slight decreases in lead, chromium, manganese and copper. As above, manganese showed the greatest decrease (664ug/l 2<sup>nd</sup> September 2009 to 268ug/l 1<sup>st</sup> March 2010).

### Surface Water Data

Due to access issues only the upstream surface water location near Moorwell Landfill (Location I) was sampled during the March 2010 monitoring event.

It was noted that a number of non-hazardous pollutants (copper, iron, lead, manganese and chromium in particular) increased in concentration across the monitoring period (February 2009 to March 2010) e.g. lead concentrations had increased from 2.08ug/l to 31.6ug/l. Manganese concentrations showed the greatest increase from 103ug/l in February 2009 to 260ug/l in March 2010.

Ammonia concentrations also increased from 0.226mg/l in 2009 to 2.81mg/l in March 2010. Chloride concentrations remained at similar levels across the period.

The location of the sampling point immediately up-stream of Moorwell suggested that the site was unlikely to be the source of these elevated contaminants; a possible source is the industrial estate to the immediate north of Moorwell, and immediately up-stream of this sampling point.

### **2.3.3 Gas Data**

No methane was detected during the March 2010 sampling event, and the maximum concentration seen in the October 2009 sampling event was 0.3% volume.

The highest methane concentrations (0.3% in October 2009) were noted in G2/09, which is located within made ground just outside the landfill boundary. This borehole also contained the highest carbon dioxide concentrations (9-14.4%) and the lowest oxygen concentrations (1.3-2.6%) across both monitoring rounds.

Carbon dioxide concentrations were typically higher in the western perimeter gas wells than within the waste gas wells. It was noted that peat and organic clays were encountered within the perimeter gas monitoring boreholes, and so naturally occurring methane and carbon dioxide are likely to be present where there are anaerobic conditions.

Oxygen concentrations detected with the exception of G2/09 were typically within the range of 18 – 21%.

### **2.3.4 Conclusions and Recommendations**

The following key conclusions were drawn from the data review:

- groundwater quality across St Mary's had typically improved since the 2009 monitoring period. Manganese, lead, chromium and copper had decreased in most monitoring locations with chloride and ammonia remaining at similar concentrations;
- surface water quality upstream of Moorwell had declined since 2009 and downstream surface water quality was thought likely to reflect this. Manganese, lead, iron, chromium, copper and ammonia had all increased in concentrations over the monitoring period;
- gas levels had remained similar over the two monitoring periods, with GW2/09 showing elevated carbon dioxide and low oxygen levels. Methane levels remained low across the monitoring locations;
- it was recommended that the monitoring recommendations set out in the Human Health and Environmental Risk Assessments were continued, in order to provide further data across the different seasons and to provide confirmation of the early trends seen in the available monitoring data; and
- there were no indications that Moorwell was having a significant impact on the water quality of Aunt Joaney's Well.

**Table 7 - Summary of Groundwater Quality Results for BH's J, K, L and M 2009**

Determinand	Units	UK DWS	Landfill BH J		Landfill BH K		Landfill BH L		Landfill BH M	
			12-Feb-09	03-Sep-09	12-Feb-09	02-Sep-09	12-Feb-09	02-Sep-09	12-Feb-09	02-Sep-09
			15:00	15:53	12:00	15:26	14:00	15:38	13:30	15:48
Non-Hazardous (List II and General Substances) - Exceedances above UK DWS										
Ammoniacal Nitrogen	mg/l	0.39	<0.03	1.47	0.474	0.437	0.528	0.825	0.0411	0.059
Antimony	ug/l	5	<20	5.7	<10	2.4	<10	<1	<10	<1
Arsenic	ug/l	10	26.9	120	105	130	279	495	8.31	10.3
Chloride	mg/l	250	144	159	385	353	462	441	153	157
Iron (dissolved)	ug/l	200	68	9660	17100	15900	59300	44900	2540	3780
Lead	ug/l	25	265	38.1	0.608	12.4	7.88	5.4	2.22	10.7
Manganese (dissolved)	ug/l	50	40.5	724	474	444	610	603	227	232
Nitrate - as N	mg/l	11	11.3	<0.196	<0.196	<0.196	0.221	<0.196	2.33	4.13
pH	pH Unit	6.5 - 9.5	6.4	6.74	6	6.14	6.27	6.46	6.16	6.12
Sodium (dissolved)	mg/l	200	98.6	122	209	197	331	200	120	116
Hazardous (List I) Substances – Detections										
Mercury	ug/l	1(DWS) 0.1 (MRV)	0.077	0.015	<0.01	<0.01	<0.01	<0.01	0.283	0.219
Cadmium	ug/l	5(DWS) 1 (MRV)	4.39	0.93	<0.1	0.16	<1	<0.1	0.11	0.23
1,2-Dimethylbenzene (o-xylene)	ug/l	10(DWS) 3 (MRV)	<0.1	<0.1	<0.1	<0.1	0.113	<0.1	0.161	<0.1
Chloroxuron	ug/l	0.1	<0.04	<0.01	<0.04	<0.01	0.084	<0.01	<0.04	<0.01
Ethylbenzene	ug/l	-	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	0.1
Toluene	ug/l	4 (MRV)	<2	<0.1	<2	0.17	<2	<0.1	<2	0.18
m,p-xylene	ug/l	3 (MRV)	<0.2	<0.2	<0.2	<0.2	<0.2	0.21	0.22	<0.2

**Table 8 - Gas Survey Results 2009**

Monitoring Point	Date	Methane (CH <sub>4</sub> ) (%)		Carbon Dioxide (CO <sub>2</sub> ) (%)		Oxygen (O <sub>2</sub> ) (%)		Barometric Pressure (mBars)	Temp (°C)	weather
		Peak	Steady	Peak	Steady	Peak	Steady			
Conduit chamber near landfill entrance	8 <sup>th</sup> October 2009	0	0	0.1	0.1	20.2	20.1	1017	14.8	Sunny
Sewer chamber nearest to weighbridge		0	0	0.1	0.1	20.2	20.2	1017	14.8	Sunny
Old Moorwell Well		0	0	0.1	0.1	20.1	20.1	1017	14.8	Sunny
G1/09		0	0	0.5	0.5	19.2	19.3	1017	14.8	Sunny
G2/09		0.3	0.3	14.4	14.4	3.2	2.6	1017	14.8	Sunny
G3/09		0.1	0	3.7	3.7	17.2	17.1	1017	14.8	Sunny
G4/09		0	0	2.4	2.2	18.5	18.4	1017	14.8	Sunny
L3		0.1	0	2.8	2.7	17.2	17.2	1017	14.8	Sunny
L2		0	0	2	2	18.1	18.1	1017	14.8	Sunny
L1		0.1	0.1	3.1	3.1	16.8	16.8	1017	14.8	Sunny



### **3.0 SLR SITE INVESTIGATION – APRIL 2013**

#### **3.1 Management of Contamination/Asbestos Risks**

Prior to the 2013 site investigation it was considered reasonable to assume that a variety of contaminants could be present within waste materials at Moorwell, although existing site investigation data (as summarised above) indicated no specific risks to human health or the environment. It was also considered that “standard” risks associated with direct contact with potentially contaminated materials during the site investigation could be managed using personal protective equipment (PPE), welfare facilities etc. Asbestos was considered likely to be the only contaminant that would require additional precautions to protect site staff and off-site residents.

Although there were not believed to be high risks associated with the presence of asbestos at the site, on the basis that both SLR and other interested parties (for example the local Resident’s Group) were aware of the possible presence of asbestos, certain health and safety precautions were required to be taken.

The significance of the site investigation in terms of the presence of asbestos is discussed later in this report. The key reasons for providing a level of assessment in relation to asbestos were:

1. To prove that the site investigation itself did not result in excessive asbestos fibre release while waste materials were disturbed; and
2. To use the data obtained to assess risks associated with current daily activities at the site and the reuse of materials in the future that might contain asbestos.

The following precautions were taken during the site investigation in relation to the possible presence of asbestos and other contamination:

- A detailed method statement and risk assessment was produced in advance of the works and reviewed by CloS;
- The site investigation was supervised by SLR at all times and all individuals involved had received at least basic asbestos awareness training;
- Prior to trial pitting the surface of the site was inspected for asbestos containing materials (such that trial pitting did not knowingly take place through asbestos) and other hazards;
- Only those personnel directly involved in the site investigation were allowed within the working area, which was defined by SLR’s Engineer and based on the location of air monitoring as discussed below;
- During the site investigation asbestos air monitoring was carried out by a UKAS accredited laboratory. This monitoring was undertaken as a combination of the following:
  1. Representative monitoring around the perimeter of the site in relation to wind direction and the assessment of asbestos fibres crossing the boundary of the area;
  2. Representative monitoring within the excavator cabs; and
  3. Specific monitoring between the site and local residents.
- Mains quality water was made available to dampen soils and other materials if excessive dust was noted; and
- PPE included steel toe capped and mid-soled boots, disposable overalls with hoods, hard hats and half face respirators with asbestos filters or P3 rated particle masks.

### **3.2 Investigation Scope of Works**

The scope of works for the site investigation comprised the following elements:

- Site walkover to visually assess surface asbestos fragments, other potential contaminants and hazards;
- Excavation of trial holes by mechanical excavator;
- Excavation of shallow, hand dug pits;
- Visual assessment of shallow soils from the above excavations;
- Collection of representative soil samples for laboratory analysis; and
- Groundwater sampling from existing monitoring wells.

### **3.3 Site Inspection**

During the initial inspection of the site suspected asbestos containing materials were identified as whole or fragmented asbestos cement bonded sheets. Samples of three different types of materials were taken for laboratory analysis. The locations in which asbestos were predominantly identified are shown on Drawing 1. These areas were avoided during subsequent trial pitting such that deliberate disturbance of asbestos did not occur.

### **3.4 Trial Pits**

Fourteen trial pits (designated TP101 to TP114) were excavated by mechanical excavator on 24<sup>th</sup> and 25<sup>th</sup> April 2013. The location of trial pits are shown on Drawing 2. The rationale for trial pit locations was to give a good general coverage of waste materials that may later be suitable for construction of bunds at the site or use in other construction activities. Trial pits were located as follows:

- TP101 to TP103 – IBA stockpile;
- TP104 to TP107 – soil/green waste stockpile;
- TP108 to TP110 – general waste comprising ash, soil and other materials;
- TP111 to TP114 – C&D waste.

Trial pits were generally around 4m in length and extended to depths up to 3.6m.

### **3.5 Hand Excavated Pits**

Three hand pits (HP115 to HP116) were excavated on the southern face of the soil/green waste stockpile. Shallow soil samples were collected in this area to avoid disturbance of the vegetated bunds that currently shield local residents from the site and since a public footpath is present in this area.

### **3.6 Waste Sampling**

During the excavation of trial pits and hand pits representative samples were collected at 1m intervals. On site headspace testing was then undertaken using a Photo Ionisation Detector (PID) to screen for VOCs. Sub-samples were then collected for laboratory analysis. On the basis that all materials sampled were stockpiled (i.e. no natural strata was encountered) composite samples through the waste profile were generally taken for laboratory analysis.

During waste sampling care was taken to avoid cross contamination of samples. Samples were collected using a fresh pair of nitrile gloves and transferred to laboratory prepared vessels. All samples were packaged in cool boxes and dispatched to a UKAS and MCERTS accredited laboratory under Chain of Custody paperwork.

### **3.7 Groundwater Sampling**

Groundwater samples were collected from three existing monitoring wells (BHK, BHL and BHM) located between the waste stockpiles and adjacent SSSI. Borehole locations are shown on Drawing 2.

All three boreholes have previously been fitted with in-line pumps and receive an electricity supply from the site workshop. After clearing areas of vegetation from around the boreholes they were purged for around 10 minutes using the pumps. After water levels had recharged the water was sampled directly from the pumps using laboratory prepared vessels.

### **3.8 Laboratory Analysis**

Selected samples of ash, C&D waste and soil/green waste were tested for the following suite of contamination testing:

- Heavy metals;
- Total petroleum hydrocarbons (TPH - working group method);
- Poly aromatic hydrocarbons (PAHs);
- Polychlorinated Bi-phenyls (PCBs);
- Phosphates, nitrates and sulphates;
- pH and total organic carbon (TOC); and
- Asbestos.

One sample of each material type was additionally submitted for leachability analysis and three samples of asbestos were tested.

All three groundwater samples were tested for the following suite of contamination testing:

- Heavy metals;
- Chloride;
- Sulphate;
- Nitrate;
- Ammoniacal nitrogen;
- Hardness;
- Conductivity;
- pH;
- Volatile organic compounds (VOCs) and semi volatile organic compounds (SVOCs); and
- Pesticides and herbicides.

## **4.0 RESULTS**

### **4.1 Ground Conditions**

Trial pit logs are included as Appendix A. A description of each material is presented below.

#### **4.1.1 IBA**

Material excavated in TP101 to TP103 comprised incinerator bottom ash, although significant amounts of unburned matter (newspaper, textiles, plastic etc) were present. Other extraneous materials included metal fragments, wire, ceramics, occasional construction materials and glass.

Suspected asbestos containing materials were identified in all three trial pits comprising of single fragments of cement bonded sheet in TP101 and TP102 and five small fragments in TP103.

**Plate 1 – TP101**





**Plate 2 – Extraneous Materials within IBA**



**Plate 3 – Suspected Asbestos Fragment within IBA**





#### **4.1.2 Soil/Green waste**

At surface level the main soil/green waste stockpile appears as a uniformly vegetated stockpile with a high soil content. Discreet stockpiles of vegetation are also present.

On the outer (south-east) side of the bunds very shallow, hand dug samples were collected to avoid the use of an excavator. Here the material comprised a brown silty/sandy topsoil with frequent vegetation.

**Plate 4 – Soil/Green Waste Stockpile**



In TP104 and TP105 (northern end of the stockpile) the material comprised a dark brown topsoil material, variably silty, sand and gravelly, with frequent plant matter (roots, branches etc). Occasional instances of C&D waste, plastic and metal were noted, however the material predominantly comprised “soily” waste with a slight organic odour.

In TP106, beneath a layer of soily material the core of the bund was noted to comprise of a mixture of soil, incinerator bottom ash and C&D waste. Material located near the top of the stockpile appeared to contain a higher soil content. One small fragment of asbestos was noted in this trial pit.



**Plate 5 – Soil in Southern Portion of Bund**



**Plate 6 – Ash Core Identified in TP106**





In TP107 the trial pit terminated at a depth of 1.2m on the basis that an asbestos sheet was encountered. It is considered likely that the core of the bund in this area would be similar to that in TP106. In this respect approximately half of the soil/green waste bund comprises soil and green waste. The other half comprises a mixture of materials with a soil covering and is more likely to contain extraneous materials.

#### **Plate 7 – TP107 and Asbestos Sheeting**



#### **4.1.3 General Waste Stockpile**

The centre of the site is occupied by a large stockpile formed from a variety of materials. The north end of the stockpile comprises C&D waste and the southern end comprises IBA. It is currently unclear where the boundary of these materials lies due to the presence of bulky waste over the majority of the stockpile. It has always been assumed that the bulk of this stockpile comprises ash.

TP108, TP109 and TP110 were constructed in locations shown on Drawing 2. In the area of TP108 and TP109 asbestos containing materials (large sheets) were noted to be present on the surface of the stockpile and were avoided. Conditions within TP108 comprised a mixture of various materials with a matrix of sand and ashy material. Other materials noted within the trial pit were concrete and bricks, plasterboard fragments, plastic piping and plastic sheet, ceramics and metal. Construction materials appeared to increase with depth.

TP109 was constructed to the rear of a 'peninsula' of material that appeared to comprise a mixture of materials with a soil matrix. The material encountered within the trial pit comprised a sandy and clayey silt with frequent inclusions of other waste types and fragments of asbestos. From a depth of 2m the material appeared to comprise predominantly of ash and C&D waste.

TP110 comprised IBA although a pocket of broken asbestos sheet was identified at 2.1m.



**Plate 8 – Suspected Asbestos Present on Stockpile Surface**



**Plate 9 – Sampling from TP108**





**Plate 10 – Variable Materials in TP109**



**Plate 11 – Asbestos Pocket in TP110**





#### **4.1.4 C&D Waste**

The C&D waste was variable in nature and comprised materials such as brick and concrete rubble, gravels, granite boulders and some ceramics. Other materials present as extraneous materials included metal, plastic, wood and plasterboard fragments.

TP111 was located at the top of the C&D stockpile. In this area some movement was noted during excavation, which may indicate that construction materials have been placed over other waste types (e.g. bulky waste). TP111 was terminated at 1m due to stability concerns.

Material in TP112 predominantly comprised a sandy gravel with other materials as noted above. At 2m occasional evidence of domestic waste (likely to be cross-contamination) was witnessed and very occasional fragments of asbestos were observed.

Material similar to the above was encountered in TP113 and TP114 along with large metal lintels. Again occasional asbestos fragments were observed.

**Plate 12 – Typical C&D Materials**





**Plate 13 – Trial Pitting of C&D Waste**



**Plate 14 – TP111**





**Plate 15 – TP112**



#### **4.2 Evidence of Contamination**

No visual or olfactory evidence of specific contamination was identified during the site investigation other than the presence of asbestos containing materials. No evidence of organic contamination (e.g. oils, solvents etc) was observed.

Headspace testing was undertaken on all samples and indicated low concentrations of VOCs. Headspace testing is a method whereby a small sub-sample is placed in a sealed container (for example a tub or bag), left for approximately 20 minutes and a PID used to sample the air above the sample for evidence of VOCs. While this does not record an actual concentration for use in risk assessment, it does give an indication of whether organic contamination is present and which samples should be selected for further analysis.

Although no specific contamination was generally observed we would comment that in some cases cross-contamination of waste streams has occurred. C&D waste often contained metals, plastics and some domestic waste for example, and much of the central stockpile contained a variety of materials. This is not necessarily an environmental risk but will require management if and when materials are later excavated and sorted.

#### **4.3 Asbestos**

As discussed throughout this report, asbestos (or rather material that appears to be asbestos on a visual basis) is present at the site and generally comprises broken or whole sheets. Asbestos was noted both at surface level and within trial pits in some cases. No fibrous or particularly friable material was identified.

Plates 16 to 18 below show the typical types of asbestos present at surface level. Samples of all three materials (Asbestos Samples 1, 2 and 3) were collected and tested. Of these three samples only Sample 3 was actually later confirmed to contain asbestos. These results are included as Appendix B and indicate the presence of chrysotile (white) asbestos only in this sample.

From the above we would comment that there are materials located across the bulky waste stockpile with the visual appearance of asbestos but that do not actually contain asbestos fibres. We would further note however, that where suspected asbestos containing materials were identified within trial pits it was generally material such as that shown in Plate 18 below and that has been confirmed to contain chrysotile asbestos.

**Plate 18 – Asbestos Sample 1**





**Plate 19 – Asbestos Sample 2**



**Plate 20 – Asbestos Sample 3**





#### 4.4 Asbestos Air Monitoring Results

Throughout the site investigation asbestos air monitoring was undertaken around the perimeter of the working area and within the cab of the excavator. The purpose of the air monitoring was to demonstrate that no unacceptable fibre release had occurred. The results of the air monitoring are included as Appendix C.

Fibre counts on microscope slides ranged from only 0.5 to 4.5 fibres, with a corresponding fibre concentration of <0.01 fibres/ml in most cases. A conservative “fail” in an enclosed environment (for example the stripping of asbestos materials within a building) would occur where 18 fibres were observed across 200 microscope fields and in this respect asbestos risk during the site investigation was very low.

Additionally, under UKAS accreditation, the analyst must include all fibres within the count, rather than specific asbestos fibres and it is quite common therefore for synthetic fibres to be included within the fibre count, especially within the excavator cab.

**Plate 21 – Asbestos Air Monitoring Pump**



## 4.5 Waste Sampling Analytical Results

The results of the chemical testing of samples of ash, soil/green waste, general/mixed waste and C&D waste are summarised in the Tables below. Full laboratory analysis certificates are included as Appendix B.

PCBs have not been included below on the basis that PCBs were below laboratory method detection limits (i.e. <5ug/kg) in all samples tested. One sample from the soil/green waste was additionally tested for pesticides and herbicides, however again no concentrations were recorded.

**Table 9 – Ash Waste Metals and Inorganics**

Contaminants	Number of samples	Number of non-detects	Range (mg/kg)		Average	Highest
			Min	Max		
Arsenic	3	0	14.8	40.6	25	TP102
Cadmium	3	0	3.1	5.7	4.8	TP102
Chromium	3	0	27.1	75.4	53	TP102
Hexavalent Chromium	3	3	<0.3	<0.3	<0.3	-
Copper	3	0	699	1038	860	TP103
Lead	3	0	375	940	700	TP102
Mercury	3	0	0.2	1.3	0.6	TP101
Nickel	3	0	46.3	111.8	74	TP102
Selenium	3	3	<1	<1	<1	-
Zinc	3	0	957	2085	1700	TP102

**Table 10 – Ash Waste PAHs and Petroleum Hydrocarbons**

Contaminants	Number of samples	Number of non-detects	Range (mg/kg)		Average	Highest
			Min	Max		
Naphthalene	2	2	<0.04	<0.04	<0.04	-
Acenaphthylene	2	2	<0.03	<0.03	<0.03	-
Acenaphthene	2	2	<0.05	<0.05	<0.05	-
Fluorene	2	2	<0.04	<0.04	<0.04	-
Phenanthrene	2	0	0.03	0.1	0.1	TP103
Anthracene	2	2	<0.04	<0.04	<0.04	-
Fluoranthene	2	0	0.09	0.3	0.21	TP103
Pyrene	2	0	0.09	0.3	0.19	TP103
Benz(a)anthracene	2	0	0.13	0.4	0.24	TP103
Chrysene	2	0	0.12	0.3	0.22	TP103
Benzo(b)fluoranthene	2	0	0.18	0.5	0.33	TP103
Benzo(k)fluoranthene	2	0	0.07	0.2	0.13	TP103
Benzo(a)pyrene	2	0	0.12	0.4	0.27	TP103
Indeno(123cd)pyrene	2	0	0.12	0.29	0.21	TP103
Dibenzo(ah)anthracene	2	1	<0.04	0.07	0.06	TP103
Benzo(ghi)perylene	2	0	0.11	0.3	0.19	TP103
PAH 16 Total	2	0	1.1	3	2.1	TP103
Aliphatics C5-C6	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C6-C8	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C8-C10	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C10-C12	2	2	<0.2	0.2	<0.2	-

Contaminants	Number of	Number	Range (mg/kg)		Average	Highest
Aliphatics >C12-C16	2	2	<4	4	<4	-
Aliphatics >C16-C21	2	2	<7	7	<7	-
Aliphatics >C21-C35	2	1	<7	111	59	TP103
Total Aliphatics C5-C35	2	1	<19	111	65	TP103
Aromatics C6-C7	2	2	<0.1	0.1	<0.1	-
Aromatics >C7-C8	2	2	<0.1	0.1	<0.1	-
Aromatics >EC8-EC10	2	2	<0.1	0.1	<0.1	-
Aromatics >EC10-EC12	2	2	<0.2	0.2	<0.2	-
Aromatics >EC12-EC16	2	2	<4	4	<4	-
Aromatics >EC16-EC21	2	2	<7	7	<7	-
Aromatics >EC21-EC35	2	1	<7	76	42	TP103
Total Aromatics C6-C35	2	1	<19	76	48	TP103
TPH (Aliphatics and Aromatics C5-C35)	2	1	<38	187	120	TP103

Table 11 – Soil/Green Waste Metals and Inorganics

Contaminants	Number of samples	Number of non-detects	Range (mg/kg)		Average	Highest
			Min	Max		
Arsenic	7	0	9.8	16.6	13	HP116
Barium	1	0	79	79	79	TP107
Beryllium	1	0	1	1	1	TP107
Cadmium	7	0	0.4	1.8	0.75	TP106
Chromium	7	0	8.9	33.3	17	TP106
Copper	7	0	45	216	98	TP106
Lead	7	0	121	1408	360	TP104
Mercury	7	3	<0.1	0.2	0.16	TP104
Nickel	7	0	7.4	23.5	15	TP104
Selenium	7	7	<1	<1	<1	-
Vanadium	1	0	12	12	12	TP107
Water Soluble Boron	1	0	3.1	3.1	3.1	TP107
Zinc	7	0	193	767	370	TP104
Hexavalent Chromium	7	7	<0.3	<0.3	<0.3	-
Nitrate as NO3 #M	2	0	86.6	630.3	360	TP105
Ortho Phosphate as PO4	2	0	0.6	8.3	4.5	TP105
Sulphate as SO4 (2:1 Ext)	1	0	0.19	0.2	0.19	TP105

Table 12 – Soil/Green Waste PAHs and Petroleum Hydrocarbons

Contaminants	Number of samples	Number of non-detects	Range (mg/kg)		Average	Highest
			Min	Max		
Naphthalene	2	2	<0.04	<0.04	<0.04	-
Acenaphthylene	2	2	<0.03	<0.03	<0.03	-
Acenaphthene	2	2	<0.05	<0.05	<0.05	-
Fluorene	2	2	<0.04	<0.04	<0.04	-
Phenanthrene	2	0	0.1	0.1	0.1	TP106
Anthracene	2	2	<0.04	<0.04	<0.04	-
Fluoranthene	2	0	0.2	0.2	0.19	TP106
Pyrene	2	0	0.1	0.2	0.16	TP106
Benz(a)anthracene	2	0	0.1	0.2	0.18	TP106
Chrysene	2	0	0.1	0.2	0.16	TP106

Contaminants	Number of	Number	Range (mg/kg)		Average	Highest
Benzo(b)fluoranthene	2	0	0.2	0.2	0.21	TP106
Benzo(k)fluoranthene	2	0	0.1	0.1	0.09	TP106
Benzo(a)pyrene	2	0	0.1	0.2	0.16	TP106
Indeno(123cd)pyrene	2	0	0.1	0.14	0.12	TP106
Dibenzo(ah)anthracene	2	2	<0.04	<0.04	<0.04	-
Benzo(ghi)perylene	2	0	0.11	0.1	0.12	TP106
PAH 16 Total	2	0	1.3	1.6	1.5	TP106
Aliphatics C5-C6	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C6-C8	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C8-C10	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C10-C12	2	2	<0.2	0.2	<0.2	-
Aliphatics >C12-C16	2	2	<4	4	<4	-
Aliphatics >C16-C21	2	2	<7	7	<7	-
Aliphatics >C21-C35	2	1	<7	41	24	TP104
Total Aliphatics C5-C35	2	1	<19	41	30	TP104
Aromatics C6-C7	2	2	<0.1	0.1	<0.1	-
Aromatics >C7-C8	2	2	<0.1	0.1	<0.1	-
Aromatics >EC8-EC10	2	2	<0.1	0.1	<0.1	-
Aromatics >EC10-EC12	2	2	<0.2	0.2	<0.2	-
Aromatics >EC12-EC16	2	2	<4	4	<4	-
Aromatics >EC16-EC21	2	2	<7	7	<7	-
Aromatics >EC21-EC35	2	1	<7	73	40	TP104
Total Aromatics C6-C35	2	1	<19	73	46	TP104
TPH (Aliphatics and Aromatics C5-C35)	2	1	<38	114	76	TP104

Table 13 – Mixed Waste Metals and Inorganics

Contaminants	Number of samples	Number of non-detects	Range (mg/kg)		Average	Highest
			Min	Max		
Arsenic	3	0	12.8	15.2	14	TP110
Cadmium	3	0	0.5	3.2	2	TP110
Chromium	3	0	15.5	91	55	TP109
Copper	3	0	70	807	440	TP110
Lead	3	0	128	585	430	TP110
Mercury	3	0	0.2	0.3	0.27	TP108
Nickel	3	0	13.5	67.7	47	TP109
Selenium	3	3	<1	<1	<1	-
Zinc	3	0	343	2116	1200	TP110
Hexavalent Chromium	3	3	<0.3	<0.3	<0.3	-

Table 14 – Mixed Waste PAHs and Petroleum Hydrocarbons

Contaminants	Number of samples	Number of non-detects	Range (mg/kg)		Average	Highest
			Min	Max		
Naphthalene	2	1	<0.04	0.1	0.1	TP109
Acenaphthylene	2	1	<0.03	0.1	0.1	TP109
Acenaphthene	2	2	<0.05	<0.05	<0.05	-
Fluorene	2	1	<0.04	0.1	0.05	TP109
Phenanthrene	2	0	0.1	0.6	0.3	TP109
Anthracene	2	1	<0.04	0.1	0.1	TP109

Contaminants	Number	Number	Range (mg/kg)		Average	Highest
Fluoranthene	2	0	0.1	1.1	0.61	TP109
Pyrene	2	0	0.1	0.9	0.5	TP109
Benz(a)anthracene	2	0	0.1	0.7	0.39	TP109
Chrysene	2	0	0.1	0.6	0.34	TP109
Benzo(b)fluoranthene	2	0	0.1	0.7	0.42	TP109
Benzo(k)fluoranthene	2	0	0.04	0.3	0.17	TP109
Benzo(a)pyrene	2	0	0.1	0.6	0.34	TP109
Indeno(123cd)pyrene	2	0	0.05	0.37	0.21	TP109
Dibenzo(ah)anthracene	2	1	<0.04	0.1	0.07	TP109
Benzo(ghi)perylene	2	0	0.06	0.3	0.2	TP109
PAH 16 Total	2	0	0.8	6.6	3.7	TP109
Aliphatics C5-C6	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C6-C8	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C8-C10	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C10-C12	2	2	<0.2	0.2	<0.2	-
Aliphatics >C12-C16	2	2	<4	4	<4	-
Aliphatics >C16-C21	2	2	<7	7	<7	-
Aliphatics >C21-C35	2	1	<7	21	14	TP109
Total Aliphatics C5-C35	2	1	<19	21	20	TP109
Aromatics C6-C7	2	2	<0.1	0.1	<0.1	-
Aromatics >C7-C8	2	2	<0.1	0.1	<0.1	-
Aromatics >EC8-EC10	2	2	<0.1	0.1	<0.1	-
Aromatics >EC10-EC12	2	2	<0.2	0.2	<0.2	-
Aromatics >EC12-EC16	2	2	<4	4	<4	-
Aromatics >EC16-EC21	2	2	<7	7	<7	-
Aromatics >EC21-EC35	2	2	<7	7	<7	-
Total Aromatics C6-C35	2	2	<19	19	<19	-
TPH (Aliphatics and Aromatics C5-C35)	2	2	<38	38	<38	-

Table 15 – C&amp;D Waste Metals and Inorganics

Contaminants	Number of samples	Number of non-detects	Range (mg/kg)		Average	Highest
			Min	Max		
Arsenic	4	0	9.9	50.4	23	TP113
Cadmium	4	0	0.2	0.8	0.4	TP113
Chromium	4	0	9	71.6	26	TP113
Copper	4	0	34	59	43	TP113
Lead	4	0	77	192	140	TP112
Mercury	4	0	0.2	0.5	0.28	TP114
Nickel	4	0	7.4	52.7	20	TP113
Selenium	4	4	<1	<1	<1	-
Zinc	4	0	167	250	210	TP111
Hexavalent Chromium	4	4	<0.3	<0.3	<0.3	-

Table 16 – C&amp;D Waste PAHs and Petroleum Hydrocarbons

Contaminants	Number of samples	Number of non-detects	Range (mg/kg)		Average	Highest
			Min	Max		
Naphthalene	2	2	<0.04	<0.04	<0.04	-
Acenaphthylene	2	0	0.03	0.1	0.04	TP112

Contaminants	Number of	Number of	Range (mg/kg)		Average	Highest
Acenaphthene	2	2	<0.05	<0.05	<0.05	-
Fluorene	2	1	<0.04	0.1	0.05	TP112
Phenanthrene	2	0	0.2	0.6	0.4	TP112
Anthracene	2	0	0.1	0.2	0.1	TP112
Fluoranthene	2	0	0.4	0.9	0.65	TP112
Pyrene	2	0	0.3	0.8	0.55	TP112
Benz(a)anthracene	2	0	0.3	0.6	0.42	TP112
Chrysene	2	0	0.2	0.5	0.34	TP112
Benzo(b)fluoranthene	2	0	0.3	0.5	0.4	TP112
Benzo(k)fluoranthene	2	0	0.1	0.2	0.15	TP112
Benzo(a)pyrene	2	0	0.2	0.4	0.31	TP112
Indeno(123cd)pyrene	2	0	0.16	0.27	0.22	TP112
Dibenzo(ah)anthracene	2	1	<0.04	0.07	0.06	TP112
Benzo(ghi)perylene	2	0	0.14	0.3	0.2	TP112
PAH 16 Total	2	0	2.3	5.3	3.8	TP112
Aliphatics C5-C6	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C6-C8	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C8-C10	2	2	<0.1	<0.1	<0.1	-
Aliphatics >C10-C12	2	2	<0.2	0.2	<0.2	-
Aliphatics >C12-C16	2	1	<4	18	11	TP113
Aliphatics >C16-C21	2	1	<7	103	55	TP113
Aliphatics >C21-C35	2	0	71	162	120	TP113
Total Aliphatics C5-C35	2	0	71	283	180	TP113
Aromatics C6-C7	2	2	<0.1	0.1	<0.1	-
Aromatics >C7-C8	2	2	<0.1	0.1	<0.1	-
Aromatics >EC8-EC10	2	2	<0.1	0.1	<0.1	-
Aromatics >EC10-EC12	2	2	<0.2	0.2	<0.2	-
Aromatics >EC12-EC16	2	2	<4	4	<4	-
Aromatics >EC16-EC21	2	1	<7	12	9.5	TP113
Aromatics >EC21-EC35	2	0	117	244	190	TP113
Total Aromatics C6-C35	2	0	117	256	190	TP113
TPH (Aliphatics and Aromatics C5-C35)	2	0	188	539	370	TP113

#### 4.6 Waste Sampling Asbestos Results

In the first instance 17 soil/waste samples were submitted for an asbestos screen. This level of analysis is designed only to establish whether asbestos is present within a given sample.

The results of this process (Appendix B) are summarised in Table 17 below. The results indicated the presence of chrysotile (white) asbestos in most samples and amosite (brown) and crocidolite (blue) asbestos in several samples.

**Table 17 – Asbestos Screen Results**

	Asbestos Screen	Asbestos Screen (2)	Asbestos Screen (3)	General Description (Bulk Analysis)	General Description (2)	General Description (3)
TP 101	Chrysotile	Amosite	Crocidolite	Soil-Silt/Stone/Brick/Fibre Bundles	Soil-Silt/Stone/Brick/Fibre Bundles	Soil-Silt/Stone/Brick/Trace Fibre
TP 102	Chrysotile	Amosite	NA	Soil-Silt/Stone/Brick/Fibre Bundles	Soil-Silt/Stone/Brick/Fibre Bundle	NA
TP 103	Chrysotile	Amosite	NA	Soil-Silt/Stone/Brick/Fibre	Soil-Silt/Stone/Brick/Fibre	NA



	Asbestos Screen	Asbestos Screen (2)	Asbestos Screen (3)	General Description (Bulk Analysis)	General Description (2)	General Description (3)
				Bundles	Bundle	
TP 104	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/Fibre Bundles	NA	NA
TP 105	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/Fibre Bundle	NA	NA
TP 106	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Trace Fibres	NA	NA
TP 107	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Fibre Bundles	NA	NA
TP 108	NAD	NA	NA	Soil- Silt/Stone/Brick/MMMF	NA	NA
TP 109	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Fibre Bundle	NA	NA
TP 110	Chrysotile	Amosite	NA	Soil- Silt/Stone/Brick/MMMF/ Fibre Bundle	Soil- Silt/Stone/Brick/MMMF /Fibre Bundle	NA
TP 111	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Fibre Bundle	NA	NA
TP 112	Chrysotile	Crocidolite	Amosite	Soil- Silt/Brick/Stone/MMMF/ Tile	Soil- Silt/Brick/Stone/MMMF /Tile	Soil- Silt/Brick/Stone/MMMF /Trace Fibres
TP 113	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Trace Fibres	NA	NA
TP 114	NAD	NA	NA	Soil- Silt/Stone/Brick/MMMF	NA	NA
HP 115	NAD	NA	NA	Soil- Silt/Stone/Brick/MMMF	NA	NA
HP 116	NAD	NA	NA	Soil- Silt/Stone/Brick/MMMF	NA	NA
HP 117	Chrysotile	NA	NA	Soil- Silt/Stone/Brick/MMMF/ Trace Fibres	NA	NA

On the basis of the above results the 13 samples in which asbestos had been detected were submitted for further quantitative analysis to determine the actual concentration of asbestos on a percent, weight for weight basis. The results are summarised in Table 18.

**Table 18 – Asbestos Quantification Results**

	Asbestos Mass %
TP101	0.029
TP102	<0.001
TP103	<0.001
TP104	0.002
TP105	<0.001
TP106	NA
TP107	<0.001
TP109	0.008
TP110	0.01
TP111	0.437
TP112	NA
TP113	NA
HP117	NA

The above results indicate asbestos at trace amounts and/or below detection limits in 8 samples. The highest concentration was in a sample of C&D waste (0.473% w/w) and the average concentration of asbestos was below 0.1% w/w, which is the carcinogenic and Hazardous Waste threshold.

#### 4.7 Leachability Analysis

In order to assess the leaching potential of waste materials at Moorwell, and notwithstanding the fact that groundwater analysis gives a more reliable indication of actual impact to controlled waters, one sample of each material type was submitted for laboratory leaching tests. The results are shown below.

**Table 19 – Leachability Analysis Results**

Contaminants	Number of samples	Number of non-detects	Range (mg/l)		Average	Highest
			Min	Max		
Arsenic	4	1	<0.0025	0.006	0.004	TP103
Boron	4	4	<0.0005	<0.0005	<0.0005	-
Cadmium	4	2	<0.0015	0.02	0.005	TP109
Chromium	4	3	<0.007	0.02	0.01	TP109
Copper	4	3	<0.005	0.01	0.007	TP109
Lead	4	4	<0.001	<0.001	<0.001	-
Nickel	4	2	<0.002	0.006	0.003	TP109
Selenium	4	4	<0.003	<0.003	<0.003	-
Zinc	4	1	<0.003	0.05	0.02	TP112
Naphthalene	4	2	<0.000014	0.00005	0.00003	TP106
Acenaphthylene	4	4	<0.000013	<0.000013	<0.000013	-
Acenaphthene	4	3	<0.00001	0.00006	0.00003	TP112
Fluorene	4	3	<0.00001	0.00005	0.00002	TP112
Phenanthrene	4	1	<0.00001	0.0003	0.0001	TP112
Anthracene	4	3	<0.00001	0.00007	0.00003	TP112
Fluoranthene	4	0	0.00003	0.0005	0.0002	TP112
Pyrene	4	0	0.00003	0.0004	0.0002	TP112
Benz(a)anthracene	4	0	0.00003	0.003	0.0001	TP112
Chrysene	4	0	0.00003	0.0002	0.0001	TP112
Benzo(b)fluoranthene	4	0	0.00006	0.0004	0.0002	TP112
Benzo(k)fluoranthene	4	0	0.00006	0.0004	0.0002	TP112
Benzo(a)pyrene	4	0	0.00004	0.0002	0.00009	TP112
Indeno(123cd)pyrene	4	0	0.00004	0.0001	0.00008	TP112
Dibenzo(ah)anthracene	4	2	<0.00001	0.00003	0.00002	TP112
Benzo(ghi)perylene	4	0	0.00002	0.00008	0.00005	TP112
Aliphatics C5-C6	4	4	<0.005	0.005	0.005	-
Aliphatics >C6-C8	4	4	<0.005	0.005	0.005	-
Aliphatics >C8-C10	4	4	<0.005	0.005	<0.005	-
Aliphatics >C10-C12	4	4	<0.005	0.005	<0.005	-
Aliphatics >C12-C16	4	4	<0.01	0.01	<0.01	-
Aliphatics >C16-C21	4	3	<0.01	0.19	<0.01	TP103
Aliphatics >C21-C35	4	3	<0.01	13.26	3.32	TP103
Total Aliphatics C5-C35	4	3	<0.01	13.45	3.37	TP103
Aromatics C6-C7	4	4	<0.005	0.005	<0.005	-
Aromatics >C7-C8	4	4	<0.005	0.005	<0.005	-
Aromatics >EC8-EC10	4	4	<0.005	0.005	<0.005	-

Contaminants	Number	Number	Range (mg/l)		Average	Highest
<b>Aromatics &gt;EC10-EC12</b>	4	4	<0.005	0.005	<0.005	-
<b>Aromatics &gt;EC12-EC16</b>	4	4	<0.01	0.01	<0.01	-
<b>Aromatics &gt;EC16-EC21</b>	4	4	<0.01	0.01	<0.01	-
<b>Aromatics &gt;EC21-EC35</b>	4	3	<0.01	0.79	<0.01	TP103
<b>Total Aromatics C6-C35</b>	4	3	<0.01	0.79	<0.01	TP103
<b>TPH (Aliphatics and Aromatics C5-C35)</b>	4	3	<0.01	14.24	3.57	TP103
<b>Organic Carbon</b>	0	0	0	<2		-

#### 4.8 Groundwater Results

The results of the chemical testing of groundwater samples are summarised in Table 20 below. Full laboratory analysis certificates are included as Appendix D.

Only contaminants reported above laboratory detection limits are included below. Those groups of contaminants not recorded above detection limits include:

- VOCs;
- SVOCs;
- PAHs;
- Phthalates;
- Organochlorine Pesticides; and
- Organophosphorus Pesticides.

**Table 20 – Groundwater Analysis Results**

Contaminants	Number of samples	Number of non-detects	Range (mg/l)		Average	Highest
			Min	Max		
<b>Aluminium</b>	3	2	<0.0015	0.02	0.008	BHK
<b>Antimony</b>	3	3	<0.002	<0.002	<0.002	-
<b>Arsenic</b>	3	0	0.007	0.008	0.007	BHK
<b>Barium</b>	3	0	0.018	0.025	0.021	BHM
<b>Beryllium</b>	3	3	<0.0005	<0.0005	<0.0005	-
<b>Boron</b>	3	0	0.138	0.286	0.210	BHM
<b>Cadmium</b>	3	3	<0.00003	<0.00003	<0.00003	-
<b>Chromium</b>	3	0	0.001	0.001	0.001	BHL
<b>Cobalt</b>	3	1	<0.0001	0.001	0.0004	BHK
<b>Copper</b>	3	2	<0.003	0.009	0.005	BHM
<b>Total Iron</b>	3	1	<0.0047	0.089	0.045	BHK
<b>Lead</b>	3	0	0.005	0.007	0.006	BHM
<b>Manganese</b>	3	0	0.164	0.677	0.410	BHL
<b>Mercury</b>	3	3	<0.0005	<0.0005	<0.0005	-
<b>Molybdenum</b>	3	0	0.007	0.012	0.009	BHM
<b>Nickel</b>	3	1	<0.0002	0.001	0.001	BHM
<b>Phosphorus</b>	3	0	0.003	0.009	0.006	BHL
<b>Selenium</b>	3	3	<0.0012	<0.0012	<0.0012	-
<b>Titanium</b>	3	3	<0.005	<0.005	<0.005	-
<b>Vanadium</b>	3	3	<0.0006	<0.0006	<0.0006	-
<b>Zinc</b>	3	0	0.008	0.079	0.035	BHM
<b>Hardness</b>	3	0	95	290	200	BHL
<b>Sulphate (soluble)</b>	3	0	66.4	95.1	85	BHK

Contaminants	Number	Number	Range (mg/l)		Average	Highest
<b>Chloride</b>	3	0	136.2	380	290	BHL
<b>Nitrate</b>	3	0	0.7	11.5	4.5	BHM
<b>Ammoniacal Nitrogen</b>	3	2	<0.03	0.41	0.16	BHK

## 5.0 CONCEPTUAL MODEL

Table 21 presents a simple, qualitative assessment known as a Conceptual Model. The purpose of the Conceptual Model is to identify potential sources of contamination, receptors that could be a risk and pathways that connect them. Its purpose is to inform which potential pollution linkages (PPLs) should be taken forward for further assessment. Unless all three elements of a pollutant linkage (i.e. the source, pathway and receptor) are in place a significant risk is not considered to exist and no further, quantitative, assessment is required.

For the purposes of the model below we have assumed that the waste materials present (although only the ash, soil/green waste, C&D waste and mixed soily waste) could be used within bund construction in the long term. On this basis human receptors could include workers at the site, visitors, local residents etc.

**Table 21 – Conceptual Model**

<b>Sources</b>	<b>Contaminant</b>	<b>Investigation Conclusions</b>	
	History	Deposition of a variety of waste types at the site over several decades. Precise nature of the materials not known but have been loosely characterised according to type.	
	Heavy metals	Elevated concentrations present, particularly in the ash. Low concentrations in other materials and in groundwater samples.	
	PAHs	Low concentrations generally recorded in all materials. Below detection limits in groundwater samples.	
	Hydrocarbons & oils	Low concentrations recorded in all media. No visual or olfactory evidence of contamination identified.	
	Gases / vapours	Low gas concentrations / flows recorded in previous assessments.	
	Asbestos	Present both on the surface of the site and buried within other wastes. Positively identified by laboratory analysis.	
<b>Receptors</b>	<b>Receptor</b>	<b>Description</b>	<b>Sensitivity</b>
	Future site users	Current/future site staff	Low
	Neighbours	Residential properties adjacent to the site	Low/Medium
	Buildings / Services	Future new buildings onsite, new service corridors at shallow depth	Low/Medium
	Groundwater	The groundwater system within the glacial deposits aquifer that underlies the Lower Moors area.	Low/Medium
	Surface waters	The Lower Moors surface water drainage system, which ultimately drains to Old Town Bay;	Low/Medium
<b>Pathways</b>	<b>Pathway</b>	<b>Linkage</b>	<b>Significance</b>
	Dermal contact, ingestion or inhalation	Onsite Plausible pathway although exposure to materials in bunds will be limited once constructed. Asbestos present on site.	Medium
	Vapour/ gas migration into buildings / outdoors	Onsite No evidence of significant organic contamination. Landfill gas risk is low.	Low
		Offsite No evidence of significant organic contamination. Landfill gas risk is low.	Low
	Ground to controlled waters	GW Plausible, although leachability results indicate low leaching potential generally.	Low/Medium
		SW As above. Existing studies generally indicate low risks.	Low/Medium
<b>Pollutant Linkages</b>	<b>Exposure Pathway</b>	<b>Assessment</b>	
	Onsite health	Direct contact plausible and needs to be managed along with asbestos risk.	
	Offsite health	Unlikely to be present but asbestos risks need to be quantified.	
	Buildings / Services	Unlikely to be present but building materials should be selected in relation to site conditions.	

Sources	Contaminant	Investigation Conclusions
	Groundwater	Existing studies indicate low risks to date.
	Surface water	Existing studies indicate low risks to date.
<b>Overall risk assessment</b>		<b>LOW/MEDIUM</b>

Based upon the above model, the most significant potential pollutant linkages (PPL) appear to be:

- PPL 1:** Inhalation of soil dust and asbestos fibres by future site users, and exposure of site workers to shallow materials used in bund construction.
- PPL 2:** Localised impacts in shallow Made Ground impacting new service corridors.
- PPL 3:** Inhalation of wind-blown asbestos fibres by off-site human receptors.
- PPL 4:** Impact to groundwater and local surface waters.

## **6.0 GENERIC QUANTITATIVE RISK ASSESSMENT**

A Generic Risk Assessment has been undertaken for the four potential pollutant linkages identified in Section 5.

### **6.1 Human Health Risk Assessment**

For PPL1 – human health risks from soil derived contaminants (other than asbestos, which is discussed separately) - the soil data for the sampled soils was compared to selected generic risk assessment criteria (GAC). The site will feature bunds constructed from materials already stockpiled at the site and as such the chemical quality of all four material types sampled during the site investigation has been used in the assessment.

With regard to the assessment of the results, it should be noted that the generic risk assessment criteria are drawn from several sources of guidance, some from non-statutory guidance and some informal. SLR uses a combination of assessment criteria that are currently available to assist in the screening of soil data prior to determining whether further action is required. The following assessment criteria have been used for the assessment of contaminant levels in soil:

- Soil Guideline Values (SGVs) – since March 2002, the Department for Environment, Food and Rural Affairs (Defra) and the Environment Agency have been involved in publishing a series of reports that provide a scientifically based framework for the assessment of risks to human health from land contamination;
- LQM (Land Quality Management)/CIEH (Chartered Institute of Environmental Health) Generic Assessment Criteria (GAC) – Land Quality Management and the Chartered Institute of Environmental Health have published GACs derived following CLR (Contaminated Land Report) technical guidance and using the Environment Agency's CLEA (Contaminated Land Exposure Assessment) UK model;
- SLR's own in-house screening criteria derived following CLR technical guidance using the CLEA UK model; and
- CLAIRE (Contaminated Land – Applications in Real Environments)/ AGS (Association of Geotechnical Specialists) / EIC (Environmental Industries Commission) Generic Assessment Criteria (GAC) – these institutions have published publically available GACs derived following CLR technical guidance and using the Environment Agency's CLEA UK model

The SGVs and GAC have been developed as a guide for regulators and developers; if the concentrations recorded on site are lower than the SGV / GAC it is generally accepted that the contaminants in question are present at acceptable concentrations which aren't capable of putting human health at significant risk - as long as the humans make normal use of the site. An exceedance of these values indicates to an assessor that soil contaminant concentrations need to be considered further. SGVs combine both authoritative science and policy judgements.

The commercial / industrial land uses GACs have been used in this assessment for a 1% soil organic matter content.

### **6.2 Controlled Waters Risk Assessment**

Risks to groundwater and surface water from dissolved contaminants have been assessed in previous reports. At the request of the EA however, additional samples were collected from three Moorwell boreholes. These results have been assessed by screening the site results against generic water quality standards and previous results.



These criteria are protective of the environmental quality of surface waters (EQS) or of human health (via Drinking Water Standards). The screening criteria are drawn from the following list with criteria from the latter standards/guidance only being used where Environmental Quality Standards and UK Drinking Water Standards are not available:

- Environmental Quality Standards (EQS) – used in the UK for amongst others, volatile organic compound contamination assessment within surface water. EQS are derived from toxicity data, noting chronic effects after long-term exposure or at sensitive life stages of target aquatic species. The EQS quoted have been taken from the EAs online chemical standards database, unless stated v2.0 19 April 2011<sup>2</sup>.
- UK Drinking Water Standards (UK DWS) – are for the protection for human health and derive from either the Water Supply (Water Quality) Regulations 1989 or 2000.
- EU Drinking Water Standards (EU DWS) – are for the protection of human health and derive from the Council Directive 98/83/EC.
- World Health Organisation Guidelines (WHO Health) protect health and derive from the World Health Organisation Guidelines for Drinking Water Quality, 1984.

For soil contaminants, the assessment comprises a qualitative review, comprising an evaluation of the results of the WAC testing of soils and comparison to the recorded quality of the underlying groundwater.

### **6.3 PPL 1 - Soils Risks to Human Health Other than Asbestos**

The soil analytical results from the site were grouped together for the four material types:

- IBS (ash waste);
- Soil/Green waste;
- General/Mixed waste (the central stockpiled material beneath the bulky waste); and
- C&D waste.

The individual sample results and maximum recorded concentrations for each contaminant were compared to generic assessment criteria (GAC) comprised of published soil guideline values (SGVs) and screening criteria derived using CLEA UK. The GAC and their sources are detailed in Appendix E.

The site will continue to operate as a waste facility, although in the future materials will be recycled and will not continue to contribute to semi-permanent stockpiles on site as currently. The purpose of this assessment is to establish whether the four material types sampled will be suitable for use in bund construction. The selected GAC for the Site are therefore for the standard commercial / industrial use.

The key results from the risk assessment process are summarised in the tables below.

The generic assessment indicates no exceedances of the GACs for any of the contaminants of concern. This means that with respect to the contaminants included within the assessment all material types are likely to be suitable for reuse on site in bund construction.

---

<sup>2</sup> <http://evidence.environment-agency.gov.uk/ChemicalStandards/Home.aspx>

**Table 22 – Generic Risk Assessment – Ash Waste Metals**

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Arsenic	640	40.6	Max	0	0.0634	Pass
Cadmium	230	5.7	Max	0	0.0248	Pass
Chromium	30000	75.4	Max	0	0.0025	Pass
Copper	72000	1038	Max	0	0.0144	Pass
Lead	5700	940	Max	0	0.1649	Pass
Mercury	3600	1.3	Max	0	0.0004	Pass
Nickel	1800	111.8	Max	0	0.0621	Pass
Selenium	13000	1	Max	0	0.0001	Pass
Zinc	670000	2085	Max	0	0.0031	Pass

Note: All concentrations in mg/kg  
Contaminants with no GAC or no detects omitted, full results in Appendix B.  
Highlighted cell represents a MVT Failure

**Table 23 - Generic Risk Assessment – Ash Waste PAHs and Petroleum Hydrocarbons**

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Naphthalene	76	0.04	Max	0	0.0005	Pass
Fluorene	153	0.04	Max	0	0.0003	Pass
Benzo(a)pyrene	14	0.42	Max	0	0.0300	Pass
Dibenzo(ah)anthracene	14	0.07	Max	0	0.0050	Pass
Aliphatics C5-C6	300	0.10	Max	0	0.0003	Pass
Aliphatics >C6-C8	150	0.10	Max	0	0.0007	Pass
Aliphatics >C8-C10	82	0.10	Max	0	0.0012	Pass
Aliphatics >C10-C12	50	0.20	Max	0	0.0040	Pass
Aliphatics >C12-C16	5000	4.00	Max	0	0.0008	Pass
Aliphatics >C16-C21	5000	7.00	Max	0	0.0014	Pass
Aliphatics >C21-C35	5000	111	Max	0	0.0222	Pass
Aromatics >EC8-EC10	620	0.10	Max	0	0.0002	Pass
Aromatics >EC10-EC12	370	0.20	Max	0	0.0005	Pass
Aromatics >EC12-EC16	5000	4	Max	0	0.0008	Pass
Aromatics >EC16-EC21	5000	7	Max	0	0.0014	Pass
Aromatics >EC21-EC35	5000	76	Max	0	0.0152	Pass

Note: All concentrations in mg/kg  
Contaminants with no GAC or no detects omitted, full results in Appendix B.  
Highlighted cell represents a MVT Failure

**Table 24 - Generic Risk Assessment – Soil/Green Waste Metals**

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Arsenic	640	16.6	Max	0	0.0259	Pass
Beryllium	420	0.6	Max	0	0.0014	Pass
Cadmium	230	1.8	Max	0	0.0078	Pass
Chromium	30000	33.3	Max	0	0.0011	Pass
Copper	72000	216	Max	0	0.0030	Pass
Lead	5700	1408	Max	0	0.2470	Pass

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Mercury	3600	0.2	Max	0	0.0001	Pass
Nickel	1800	23.5	Max	0	0.0131	Pass
Selenium	13000	1	Max	0	0.0001	Pass
Vanadium	3200	12	Max	0	0.0038	Pass
Zinc	670000	767	Max	0	0.0011	Pass

Note: All concentrations in mg/kg  
Contaminants with no GAC or no detects omitted, full results in Appendix B.  
Highlighted cell represents a MVT Failure

**Table 25 - Generic Risk Assessment – Soil/Green Waste PAHs and Petroleum Hydrocarbons**

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Naphthalene	76	0.04	Max	0	0.0005	Pass
Fluorene	153	0.04	Max	0	0.0003	Pass
Benzo(a)pyrene	14	0.2	Max	0	0.0121	Pass
Dibenzo(ah)anthracene	14	0.04	Max	0	0.0029	Pass
Aliphatics C5-C6	300	0.1	Max	0	0.0003	Pass
Aliphatics >C6-C8	150	0.1	Max	0	0.0007	Pass
Aliphatics >C8-C10	82	0.1	Max	0	0.0012	Pass
Aliphatics >C10-C12	50	0.2	Max	0	0.0040	Pass
Aliphatics >C12-C16	5000	4	Max	0	0.0008	Pass
Aliphatics >C16-C21	5000	7	Max	0	0.0014	Pass
Aliphatics >C21-C35	5000	41	Max	0	0.0082	Pass
Aromatics >EC8-EC10	620	0.1	Max	0	0.0002	Pass
Aromatics >EC10-EC12	370	0.2	Max	0	0.0005	Pass
Aromatics >EC12-EC16	5000	4	Max	0	0.0008	Pass
Aromatics >EC16-EC21	5000	7	Max	0	0.0014	Pass
Aromatics >EC21-EC35	5000	73	Max	0	0.0146	Pass

Note: All concentrations in mg/kg  
Contaminants with no GAC or no detects omitted, full results in Appendix B.  
Highlighted cell represents a MVT Failure

**Table 26 - Generic Risk Assessment – Mixed Waste Metals**

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Arsenic	640	15.2	Max	0	0.0238	Pass
Cadmium	230	3.2	Max	0	0.0139	Pass
Chromium	30000	91	Max	0	0.0030	Pass
Copper	72000	807	Max	0	0.0112	Pass
Lead	5700	585	Max	0	0.1026	Pass
Mercury	3600	0.3	Max	0	0.0001	Pass
Nickel	1800	67.7	Max	0	0.0376	Pass
Selenium	13000	1	Max	0	0.0001	Pass
Zinc	670000	2116	Max	0	0.0032	Pass

Note: All concentrations in mg/kg  
Contaminants with no GAC or no detects omitted, full results in Appendix B.  
Highlighted cell represents a MVT Failure

**Table 27 - Generic Risk Assessment – Mixed Waste PAHs and Petroleum Hydrocarbons**

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Naphthalene	76	0.1	Max	0	0.0008	Pass
Fluorene	153	0.1	Max	0	0.0003	Pass
Benzo(a)pyrene	14	0.6	Max	0	0.0429	Pass
Dibenzo(ah)anthracene	14	0.1	Max	0	0.0071	Pass
Aliphatics C5-C6	300	0.1	Max	0	0.0003	Pass
Aliphatics >C6-C8	150	0.1	Max	0	0.0007	Pass
Aliphatics >C8-C10	82	0.1	Max	0	0.0012	Pass
Aliphatics >C10-C12	50	0.2	Max	0	0.0040	Pass
Aliphatics >C12-C16	5000	4	Max	0	0.0008	Pass
Aliphatics >C16-C21	5000	7	Max	0	0.0014	Pass
Aliphatics >C21-C35	5000	21	Max	0	0.0042	Pass
Aromatics >EC8-EC10	620	0.1	Max	0	0.0002	Pass
Aromatics >EC10-EC12	370	0.2	Max	0	0.0005	Pass
Aromatics >EC12-EC16	5000	4	Max	0	0.0008	Pass
Aromatics >EC16-EC21	5000	7	Max	0	0.0014	Pass
Aromatics >EC21-EC35	5000	7	Max	0	0.0014	Pass

Note: All concentrations in mg/kg  
Contaminants with no GAC or no detects omitted, full results in Appendix B.  
Highlighted cell represents a MVT Failure

**Table 28 - Generic Risk Assessment – C&D Waste Metals**

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Arsenic	640	50.4	Max	0	0.0788	Pass
Cadmium	230	0.8	Max	0	0.0035	Pass
Chromium	30000	71.6	Max	0	0.0024	Pass
Copper	72000	59	Max	0	0.0008	Pass
Lead	5700	192	Max	0	0.0337	Pass
Mercury	3600	0.5	Max	0	0.0001	Pass
Nickel	1800	52.7	Max	0	0.0293	Pass
Selenium	13000	1	Max	0	0.0001	Pass
Zinc	670000	250	Max	0	0.0004	Pass

Note: All concentrations in mg/kg  
Contaminants with no GAC or no detects omitted, full results in Appendix B.  
Highlighted cell represents a MVT Failure

**Table 29 - Generic Risk Assessment – C&D Waste PAHs and Petroleum Hydrocarbons**

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Naphthalene	76	0.04	Max	0	0.0005	Pass
Fluorene	153	0.05	Max	0	0.0003	Pass
Benzo(a)pyrene	14	0.43	Max	0	0.0307	Pass
Dibenzo(ah)anthracene	14	0.07	Max	0	0.0050	Pass

Contaminants	Selected GAC (mg/kg)	RC	RC type	No. over GAC	Hazard Quotient	Pass or fail MVT?
Aliphatics C5-C6	300	0.1	Max	0	0.0003	Pass
Aliphatics >C6-C8	150	0.1	Max	0	0.0007	Pass
Aliphatics >C8-C10	82	0.1	Max	0	0.0012	Pass
Aliphatics >C10-C12	50	0.2	Max	0	0.0040	Pass
Aliphatics >C12-C16	5000	18	Max	0	0.0036	Pass
Aliphatics >C16-C21	5000	103	Max	0	0.0206	Pass
Aliphatics >C21-C35	5000	162	Max	0	0.0324	Pass
Aromatics >EC8-EC10	620	0.1	Max	0	0.0002	Pass
Aromatics >EC10-EC12	370	0.2	Max	0	0.0005	Pass
Aromatics >EC12-EC16	5000	4	Max	0	0.0008	Pass
Aromatics >EC16-EC21	5000	12	Max	0	0.0024	Pass
Aromatics >EC21-EC35	5000	244	Max	0	0.0488	Pass

Note: All concentrations in mg/kg  
Contaminants with no GAC or no detects omitted, full results in Appendix B.  
Highlighted cell represents a MVT Failure

#### 6.4 PPL 2 - Soil Impacts to New Services

There are various guidance documents available in terms of assessing risks and the level of protection required for installing new services in contaminated land. Given the investigation findings, SLR has assumed that any new services that will be constructed on site will be protected appropriately e.g. new water pipes etc. In reality such services are unlikely to be constructed through waste materials at Moorwell.

As such this pollutant linkage is not suitable for quantitative assessment. This pathway can be mitigated by designing appropriate engineered measures within newly constructed service corridors, such as clean gravel or site won deeper sand for pipe bedding and the use of geotextile membranes within the service trench excavations to ensure no preferential pathways are created.

#### 6.5 PPL 4 – Impact to Controlled Waters

Concentrations of potential contaminants in the stockpiled materials pose a potential risk to the quality of controlled waters off site via:

- Leaching of contaminants from stockpiled material;
- Impact on the groundwater system within the glacial deposits aquifer that underlies the Lower Moors area;
- Lateral migration to the adjacent surface water drainage system; and / or
- Lateral migration to Joaney's Well, located approximately 400m to the east of the landfill boundary on the opposite side of the Lower Moors.

As discussed in Section 2.0 of this report, extensive risk assessment has already been undertaken in relation to potential risks to Controlled Waters and these risks, subject to additional monitoring, are believed to be low. For completeness however, the results of groundwater monitoring from boreholes BHK, BHL and BHM have been subjected to a generic screen against selected water quality standards (WQS) to determine whether there are any critical contaminants of concern.

Additionally the results have been compared to the maximum concentrations recorded in these boreholes during previous monitoring visits and a qualitative assessment of the leachate results is presented.

### 6.5.1 Generic Assessment – Groundwater

Table 30 shows a comparison of all three groundwater samples to EQS and DWS values where available, along with a comparison with the maximum concentration recorded previously from any borehole.

Only contaminants reported above laboratory detection limits are included below. Those groups of contaminants not recorded above detection limits include:

- VOCs;
- SVOCs;
- PAHs;
- Phthalates;
- Organochlorine Pesticides; and
- Organophosphorus Pesticides.

**Table 30 – Generic Risk Assessment - Groundwater**

Contaminants	BHL	BHK	BHM	EQS Freshwater	DWS	Max Previous Result
<b>Aluminium</b>	<0.0015	0.0198	<0.0015	n/a	0.02	-
<b>Antimony</b>	<0.002	<0.002	<0.002	n/a	0.005	<0.02
<b>Arsenic</b>	0.0076	0.0079	0.0066	0.05	0.01	0.495
<b>Barium</b>	0.0176	0.019	0.0254	n/a	1	-
<b>Beryllium</b>	<0.0005	<0.0005	<0.0005	n/a	n/a	-
<b>Boron</b>	0.138	0.204	0.286	2	1	-
<b>Cadmium</b>	<0.00003	<0.00003	<0.00003	0.005	0.005	0.00439
<b>Chromium</b>	0.0009	0.0008	0.0009	0.01*	0.05	0.0166
<b>Cobalt</b>	<0.0001	0.0008	0.0002	n/a	n/a	-
<b>Copper</b>	<0.003	<0.003	0.009	0.04*	2	0.218
<b>Total Iron</b>	0.0396	0.0892	<0.0047	1	0.2	59.3
<b>Lead</b>	0.0056	0.0047	0.0069	0.01*	0.025	0.265
<b>Manganese</b>	0.6769	0.3789	0.1641	n/a	0.05	0.61
<b>Mercury</b>	<0.0005	<0.0005	<0.0005	0.001	0.001	0.000283
<b>Molybdenum</b>	0.0065	0.0096	0.0117	n/a	n/a	-
<b>Nickel</b>	0.0008	<0.0002	0.0014	0.1*	0.02	-
<b>Phosphorus</b>	0.0092	0.0034	0.0054	n/a	2.2	-
<b>Selenium</b>	<0.0012	<0.0012	<0.0012	n/a	0.01	-
<b>Titanium</b>	<0.005	<0.005	<0.005	n/a	n/a	-
<b>Vanadium</b>	<0.0006	<0.0006	<0.0006	0.02**	n/a	-
<b>Zinc</b>	0.0159	0.0077	0.0792	0.3*	5	-
<b>Hardness</b>	290	207	95	n/a	n/a	-
<b>Sulphate</b>	91.61	95.11	66.36	400	250	-
<b>Chloride</b>	380	335.4	136.2	250	250	462
<b>Nitrate</b>	1.3	0.7	11.5	n/a	50	11.3
<b>Ammoniacal Nitrogen</b>	<0.03	0.41	<0.03	0.015	0.39	0.825

Note: All concentrations in mg/l.  
All result below Limit of Detection (LOD). LOD above WQS.  
\* at 50-100 CaCO<sub>3</sub>/l  
\*\* at 0-200 mg CaCO<sub>3</sub>/l

The above results indicate that only manganese, chloride and ammoniacal nitrogen were detected marginally above the relevant water quality standards. It should be noted that this is a straight comparison with water standards and does not allow for any form of dilution or attenuation. When compared to the maximum recorded concentrations from 2009 (and that have been proven via risk assessment to present no risk to Controlled Waters receptors) all recorded concentrations in 2013 were lower. Additionally, the slightly elevated concentrations of chloride are likely to be due to saline intrusion.

Based on the above, the material currently stockpiled at the site is not considered to be causing groundwater pollution and is likely to be suitable for use in future bunds.

### **6.5.2 Soil Leaching Risks - Qualitative Summary**

Leachability analysis of selected samples is included in Appendix B and summarised in Table 19. The results do not indicate high leaching potential in most cases. More importantly, analysis of samples of the underlying groundwater recorded no evidence of widespread impact as discussed above, indicating that impact to groundwater from contaminants leaching from stockpiled materials does not appear to be occurring on site.

## **6.6 PPL 1 and 3 - Asbestos Risk Assessment**

This section considers risks specifically posed by asbestos containing materials, both to the site itself and off-site human receptors.

### **6.6.1 Why Asbestos is a Human Health Risk**

Asbestos becomes a risk to human health if asbestos fibres are inhaled. There are four main diseases commonly associated with asbestos inhalation; namely:

- Mesothelioma;
- Lung cancer;
- Asbestosis; and
- Pleural thickening.

Asbestos is a Class 1 carcinogen and as such harm to human health could occur at any level of exposure. In practice however, elevated risk is present when a high level of exposure occurs and an individual breathes in asbestos fibres. The Health and Safety Executive (HSE) provides a variety of information in relation to working with asbestos and asbestos risks are controlled in the UK by the Control of Asbestos Regulations 2012.

Risks associated with asbestos within soil or waste construction materials are less understood, although a joint industry working group (JIWG) is currently looking at the issue. Currently in the UK there is no clear approach to the management of asbestos contaminated soil that could be deemed Best Practice. Traditionally reference has been made to an ageing threshold (0.001%w/w) given in ICRCL Guidance Note 64/85, but reference to any sort of generic threshold value that does not consider site specific risks would not be considered appropriate in SLR's view.

SLR has been retained on a significant number of asbestos-contaminated sites in the UK and has considerable experience of dealing with the unique risks present. In practical terms much more important than the percentage of asbestos present is the type of asbestos, the



matrix in which it is present and the propensity for actual fibre release and human exposure. The three main types of asbestos likely to be encountered on a development or waste site are:

1. Chrysotile (white asbestos);
2. Amosite (brown asbestos); and/or
3. Crocidolite (blue asbestos).

Although it is true that the shape and structure of amosite and crocidolite make them potentially more harmful than chrysotile, more important than the asbestos type is usually the matrix in which the asbestos is present and therefore the propensity for asbestos fibre release and actual risk of human inhalation. For this reason we describe the following general asbestos material types:

- Type 1 – asbestos contained within a firm matrix – this includes asbestos cement products, textured decorative coatings, asbestos paints and any item of bitumen, plastic, resin or rubber (e.g. vinyl floor tiles, electric cables, roofing felt).
- Type 2 – asbestos not contained within a firm matrix – for this project these are any asbestos containing materials not listed above, but particularly asbestos insulation (e.g. lagging materials) and asbestos insulating board (AIB).

The risks associated with the above differ substantially. Type 1 asbestos has a much lower propensity for fibre release and in many cases requires no actual remediation when encountered on a development site.

Two of the key objectives of the proposed site investigation at Moorwell were to establish the significance of asbestos at the site and provide evidence that the investigation itself was undertaken safely and with due regard to on and off-site human receptors.

### **6.6.2 Asbestos Risk Assessment**

#### **Visual Assessment**

Materials suspected to contain asbestos were observed in several areas of the site at surface level, notably those areas marked on Drawing 1. Although the presence of other materials cannot be entirely discounted the only materials observed on site were whole or fragmented cement sheets (i.e. Type 1 asbestos).

In addition to asbestos observed at surface level, fragmented asbestos was identified in all four material types investigated i.e. ash, green waste/soil, mixed wastes and C&D waste.

Within the ash material no asbestos is visible at surface level. Within trial pits occasional fragments of asbestos sheet were generally reported. These are likely to be present due to cross-contamination by other waste streams or, possibly, where asbestos containing materials have been placed in the incinerator. In one case (TP110) a pocket of asbestos was encountered at a depth of around 2m. This particular area of the site is at the interface of other materials such as bulky and mixed waste.

Asbestos materials within the soil/green waste appear to be limited to the southern end of stockpile on the inner (i.e. site) face. In this area several large sheets are present along with fragmented asbestos. Asbestos was not observed in about 50% of the stockpile.

Asbestos containing materials are most evident in the area of trial pits TP108 and TP109. This area is probably formed by a core of ash material, but in reality comprises mixed waste

made up of soil, ash, construction materials, bulky waste and other wastes. Asbestos cement sheet is present at surface level and fragmented within the deeper layers of waste.

In the C&D waste stockpile only rare incidences of asbestos cement in fragmented form were identified. Asbestos is not visible at surface level.

On the basis of the above an initial (i.e. qualitative) view of asbestos risk would be:

1. Asbestos materials have been accepted to the site historically, although probably not recently based on staff interviews and given that all staff have recently undergone asbestos training to increase awareness;
2. Asbestos appears to be concentrated in several key areas of the site, but there is potential for small amounts of asbestos to be present anywhere on site;
3. Measures to improve the distribution of asbestos containing materials and limit further cross-contamination would be relatively simple to implement and are recommended. The removal of visible asbestos from the surface of the site to a sealed would improve the situation considerably; and
4. Notwithstanding the above, based on the type of asbestos present, the risk of significant fibre release is likely to be low. The predominant asbestos type appears to be cement sheet. Cement sheet is usually only 10% to 15% asbestos and the fibres are bound within a firm matrix. Providing the material is not significantly agitated (e.g. crushed, cut etc) risks associated with the material being present at the site now, or in the future within bunds, are likely to be low.

#### Laboratory Analysis Results

The initial laboratory analysis results indicated the presence of asbestos in the majority of samples. This level of analysis is a simple screen. Further, quantitative analysis was then undertaken on 13 samples. This indicated measurable concentrations of asbestos in the following samples:

- TP101 (ash waste) 0.029% asbestos;
- TP104 (soil/green waste) 0.002% asbestos;
- TP109 (mixed waste) 0.008% asbestos;
- TP110 (mixed waste/ash waste) 0.01% asbestos; and
- TP111 (C&D waste) 0.437% asbestos.

In all of the above asbestos was detected as loose fibres. These results, while interesting, do not necessarily reflect what was observed on site (for example a positive detection in TP104 where asbestos was not observed and the highest concentration within TP111) and do not necessarily help determine the level of risk present through possible fibre release (as discussed below). We would however, comment that asbestos fibre concentrations are generally quite low and in most cases below the 0.1% threshold that would render the material hazardous waste if off-site disposal was required.

#### Air Monitoring Results

The results of visual assessment and laboratory analysis confirms the presence of asbestos both as fragmented asbestos sheet and small amounts of loose fibres. In order to assess the actual potential for asbestos fibre release into the air (and therefore the potential for human receptors to be at risk) SLR undertook asbestos air monitoring.

Although there are other methods (e.g. dustiness testing) that can be used to assess risks associated with asbestos fibres release from granular materials, SLR's view is that the most

representative way to assess site specific risk is to re-create conditions that might reasonably be expected to occur as the site is developed.

If stockpiled materials that contain small amounts of asbestos are, in the future, used for the construction of permanent bunds, long term risks to human health (on or off-site) are likely to be very low. Once placed the material will not be disturbed, the bunds will be vegetated, direct contact will be negligible and the risk of significant fibre release will, in SLR's view, be very low.

The highest risks associated with asbestos are likely to be during the waste excavation/processing/placement stage where asbestos containing materials could be disturbed. These risks were also recognised during the site investigation itself, which included the excavation of large trial pits within material that contained asbestos. The air monitoring undertaken as discussed in Section 4.4 therefore demonstrates the following:

- That the movement of soils during the site investigation did not result in excessive asbestos fibre release into the air; and
- That the movement of the same material to construct bunds in the future is unlikely to result in excessive risks to human health.

#### Asbestos Risk Summary

Given all of the above our view would be that current site activities are unlikely to represent a significant risk to site operatives, visitors or local residents. Additionally the presence of asbestos containing materials within stockpiled materials need not prevent the re-use of the materials in bunds at Moorwell. The human health risks associated with the asbestos detected are considered to be low. We would however, comment that risks in relation to asbestos need to be continually assessed. In particular we would recommend the following:

- That asbestos containing materials present on the surface of the site and stockpiled materials are removed to sealed containers by trained personnel. This will not only reduce risks associated with further cross contamination but will significantly reduce overall asbestos content;
- All personnel involved with major earthworks during the development of the site should be trained to identify asbestos materials. If other types of asbestos are encountered (e.g. lagging) additional control measures may need to be put into place; and
- Asbestos air monitoring should be undertaken during the excavation of waste and construction of permanent bunds.

## 7.0 WASTE CLASSIFICATION

It is proposed that the legacy waste issues at Moorwell are dealt with in such a way that off-island disposal to landfill is avoided where possible. The reuse of currently stockpiled materials will reduce the need for off-site disposal routes and reduce the need for imported resources.

Notwithstanding the above, a waste classification has been undertaken to determine whether or not the contaminant concentrations would render the material Hazardous or Non-Hazardous Waste. The assessment is included as Appendix F and indicates that the material comprises only Non-Hazardous Waste.

In relation to asbestos, soils and other granular materials become hazardous waste once asbestos content exceeds 0.1% w/w. To put this into context, given the actual percentage of asbestos present in typical asbestos cement sheet it would require the presence of nearly a hundred 10cm by 10cm fragments of asbestos in one tonne of material (about the size of a typical excavator bucket) to render the material hazardous waste assuming significant fibre content was not also present. This volume of asbestos (other than where it has been placed in sheets at surface level) was never encountered at Moorwell during the site investigation.

The current view of the Environment Agency is based on a case where they were asked to comment on at what stage construction and demolition waste impacted with asbestos became Hazardous Waste. The decision taken was based on a distinction between material with and without a separately identifiable phase of asbestos. Where asbestos is identifiable (i.e. visible) and benefit would be had by its removal, the material is Hazardous. Where there is no visibly identifiable phase of asbestos, and overall asbestos content is below 0.1% w/w the material could be non-hazardous.

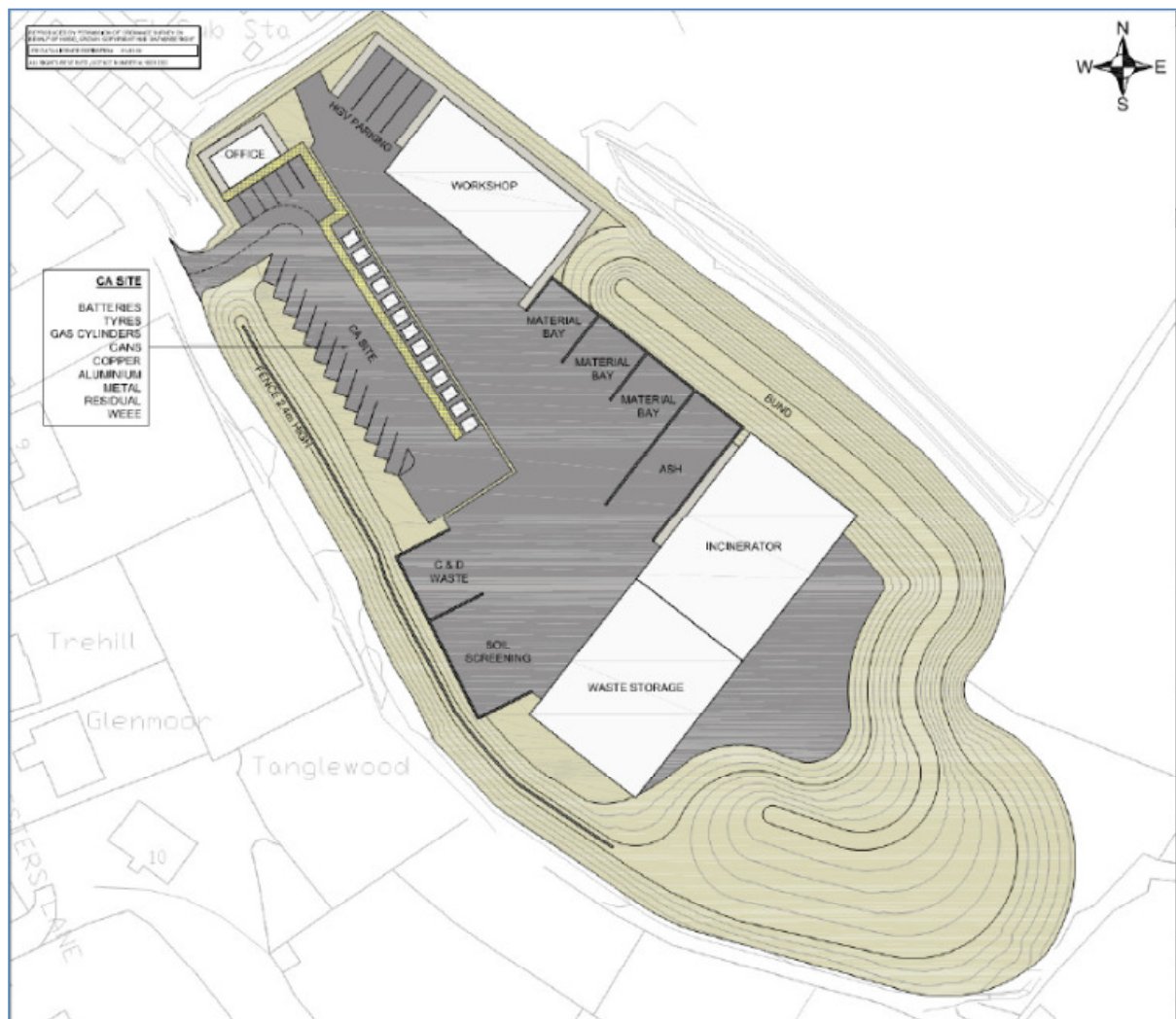
In relation to the above we would comment that it is recommended that asbestos sheets currently located on the surface of the site are placed within sealed skips. We do not necessarily regard this as treatment, rather sensible housekeeping to prevent further cross-contamination. With this material placed in skips our view would be that a separate phase of asbestos (other than the potential for occasional pockets of asbestos) is not likely to be present. In other words we do not see that remediation of stockpiled materials specifically to remove further incidences of asbestos would represent a substantial environmental benefit. On this basis, and since the average measured concentration of asbestos fibres in the material is less than 0.1% w/w, SLR would seek to agree with the Environment Agency that the material is Non-Hazardous Waste.

## 8.0 CONCLUSIONS AND MATERIAL REUSE POTENTIAL

### 8.1 Assessment Summary

The purpose of the site investigation summarised in this report was to establish that materials currently stockpiled at Moorwell do not pose a risk to human or environmental receptors and to provide evidence that the reuse of these materials in bunds would be appropriate if and when the site is redeveloped with new waste management facilities. There is currently no final design for the redevelopment of the site, however various options, including that shown in Figure 2 below are being considered.

**Figure 2 – Possible Site Layout Following Redevelopment**



Any scheme ultimately chosen for the redevelopment of the site is almost certain to require the provision of visual attenuation bunds to shield the site from local residents. It is proposed that materials currently stockpiled at the site are used for this purpose.

A site investigation was undertaken by SLR in April 2013. This followed extensive study undertaken at the site in 2009 where it was established that the site, in its current condition, does not pose a significant risk to Controlled Waters or a local groundwater abstraction borehole.

The 2013 site investigation comprised the excavation of trial pits, sampling from hand-excavated pits, asbestos air monitoring and groundwater sampling. Samples of four key waste types were collected and laboratory analysis undertaken by an accredited laboratory.

The results of the site investigation indicated no visual or olfactory evidence of contamination other than the presence of asbestos containing materials. It was noted however, that in many cases individual waste streams have become mixed. In particular the central stockpile contains a mixture of materials including ash, soil, construction materials etc. In addition this central area of the site contains bulky waste (furniture, mattresses etc) on top of the central stockpile. Although this limited the location and number of trial pits in this area a good coverage of the site was achieved.

A risk assessment was undertaken based on the laboratory analysis of waste samples. The assessment indicates that the concentrations of contaminants present in the IBA (ash waste), soil/green waste, a mixed waste material and C&D waste do not pose a significant risk to human or environmental receptors based on a continued commercial use of the site.

Groundwater analysis generally indicates low concentrations of contamination and in most cases individual dissolved contaminants were below laboratory detection limits and/or Drinking Water Standards. On the basis that levels of contamination have not increased since 2009 (in fact they generally fallen) SLR continues to support the view that the site is not currently causing pollution of Controlled Waters.

The key issue identified in waste materials at the site was the presence of asbestos containing materials. Although these are present in various areas of the site a simple exercise to collect this material and place it within sealed skips for later off-site disposal would considerably improve the situation. In addition, the materials observed on site were noted to comprise lower risk asbestos i.e. those contained within a firm matrix and that are not prone to significant fibre release unless significantly agitated/crushed.

Fragmented asbestos and some loose fibres were identified in all four waste types in which intrusive investigation was undertaken. Based on visual observations and asbestos air monitoring however, SLR's view would be as follows:

- Other than removal of surface asbestos (i.e. asbestos sheets) the volume of asbestos present does not necessarily justify the remediation of the stockpiled material specifically to reduce asbestos content if the materials are to be retained on site in the future;
- The risks posed to human receptors (site operative and local residents) is considered low; and
- Given the above the presence of some asbestos materials in stockpiled waste should not prevent the reuse of the material at Moorwell providing risks are frequently reviewed and certain precautions undertaken.

## **8.2 Reuse Potential and Recommendations**

Given the assessment undertaken and subject to obtaining Planning Permission and a suitable Environmental Permit the materials currently stockpiled at the Moorwell Waste Facility are considered likely to be suitable for use in future bund construction and in the context of the continued operation of the site as a waste facility.

Short term risks during the construction phase are likely to be higher than long term risks associated with recovery of the material in bunds, however it is considered that short term risks can be managed in such a way to avoid unacceptable risks to human health or the environment.



In terms of recommendations for further assessment additional sampling of the waste materials at this stage may not yield a significant benefit. At a high level risks to human health are considered manageable. Some of the waste cannot currently be accessed for sampling due to the presence of overlying materials. For this reason it is unlikely that the material will be fully characterised until commencement of redevelopment of the site and the removal of certain waste types (e.g. bulky waste) commences. In SLR's view, and having established that the material present is generally suitable for use for future bund construction, a watching brief should be maintained throughout the duration of redevelopment works such that if unexpected contamination is encountered risks are re-assessed and remedial works undertaken if deemed necessary.

In relation to risks to Controlled Waters the current level of assessment undertaken indicates that the use of materials discussed in this report for bund construction will not result in a significant, ongoing risk. On the basis that only limited further monitoring has been undertaken since SLR's risk assessment report of December 2009 however, it is recommended that the suggested monitoring works discussed in that report are adopted up to, and throughout the duration of, the proposed site redevelopment works.

---

## Drawings






---

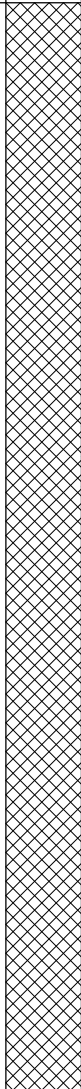
## Appendices

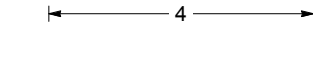


---

## **Appendix A – Trial Pit Logs**

<div> <div>TRIAL PIT LOG</div> </div>				<div> <div>TRIAL PIT No</div> <div>TP101</div> </div>
<div> <div>Client:</div> <div>COUNCIL OF THE ISLES OF SCILLY</div> </div>				<div> <div>SLR</div>  </div>
<div> <div>Project:</div> <div>MOORWELL WASTE MANAGEMENT SITE</div> </div>				
<div> <div>Project No:</div> <div>416.03263.00001</div> </div>	<div> <div>Date:</div> <div>24/04/13</div> </div>	<div> <div>Ground Level:</div> </div>	<div> <div>Co-ordinates:</div> </div>	<div> <div>Sheet:</div> <div>1 of 1</div> </div>

SAMPLES & TESTS				Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	
1.00-3.60	ES HS	HS	<1ppm			(3.60)	MADE GROUND: Dark grey/brown, becoming light brown fine to coarse ash with frequent cemented boulders (>50cm dia). Occasional red/brown staining and sandy pockets.	
2.00	HS	HS	<1ppm				Frequent (10-20%) incinerated metals, plastics, paper and cloth materials, wires and copper cable. Various fragments of ceramics, glass, bone and wood.	
3.00	HS	HS	1ppm				2.50 1 x asbestos cement bound tile approximately 10 x 20cm	
3.60	HS	HS	3ppm					
								Trial Pit complete at 3.60m

<p>GENERAL REMARKS:</p> <p>1. Trial pit dry and stable whilst open.</p>		<p>Trial Pit Dimensions:</p> 	
<p>KEY:</p> <p>V = Hand Vane Shear Strength</p> <p>PP = Pocket Penetrometer Shear Strength</p> <p>D = Small Disturbed Sample</p> <p>B = Large Bulk Sample</p> <p>HS = Head Space Measurement</p>		<p>Shoring/Support: Stability:</p>	
<p>All dimensions in metres</p> <p>Scale 1:25</p>	<p>Contractor :</p> <p>Plant:</p>	<p>Method: Trial Pit/trench</p>	<p>Logged By: SMJ</p> <p>Approved By: DJC</p>

Shoring/Support:  
Stability:

SLR 

Form SLR AGS3 UK TP File 130525 416.03263.00001 MOORWELL LOGS.GPJ 18-07-13

**Trial Pit Dimensions:**

4




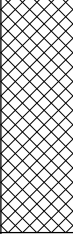

1

**Shoring/Support:**

**Stability:**

SLR Consulting Ltd, 19 Hollingworth Court, Turkey Mill,, Maidstone, Kent, ME14 5PP, Tel: , Fax:   
 LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930



TRIAL PIT LOG				TRIAL PIT No <b>TP103</b>	
Client: <b>COUNCIL OF THE ISLES OF SCILLY</b>					
Project: <b>MOORWELL WASTE MANAGEMENT SITE</b>					
Project No: 416.03263.00001		Date: 24/04/13	Ground Level:	Co-ordinates:	Sheet: 1 of 1

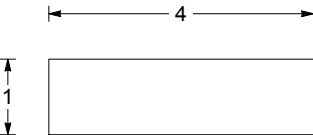
SAMPLES & TESTS				Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	
1	1.00	HS	2ppm				(2.00)	MADE GROUND: Dark Grey/Black medium to coarse ash, with varying amounts (up to 15%) of glass, plastic, ceramics, paper, tin cans and whole bottles.  1.00 One piece of asbestos sheet 20 x 10cm noted.
							2.00	
2	2.00	HS	3ppm				(0.20) 2.20	MADE GROUND: Brick and concrete cobbles (Hardcore and rare concrete boulders (1m x 0.5m ) with large fragments of metal and rare whole bricks.  5 Asbestos fragments <10cm noted.
3	3.00	HS	5ppm				(1.50)	MADE GROUND: Dark Grey/Black slightly clayey, slightly sandy, medium to coarse ash with varying amounts (up to 20%) of glass, plastic, ceramics, paper, tin cans and whole bottles.  Topsoil/loam content increasing with depth, with occasional construction and demolition waste and organic odour noted.
	3.50	ES	1ppm				3.70	3.50 Becoming damp with strong organic odour.
								Water seepage observed with trial pit becoming unstable.  Trial Pit complete at 3.70m

<p><b>GENERAL REMARKS:</b> 1. Trial pit stable to 3.5. 2. Water seepage noted at 3.7m. 3. Trial Pit becoming unstable at 3.7m excavation terminated.</p> <p><b>KEY:</b> V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement</p>	<p><b>Trial Pit Dimensions:</b></p> <p>Shoring/Support: Stability:</p>
---	--


All dimensions in metres Scale 1:25	Contractor : Plant:	Method: Trial Pit/trench	Logged By: DJC	Approved By: DJC
--	------------------------	--------------------------	-------------------	---------------------

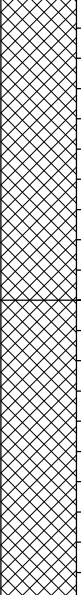
<div> <div>TRIAL PIT LOG</div> <div> <div>Client:</div> <div>COUNCIL OF THE ISLES OF SCILLY</div> </div> <div> <div>Project:</div> <div>MOORWELL WASTE MANAGEMENT SITE</div> </div> </div>				<div>TRIAL PIT No</div> <div>TP104</div>
<div>Project No:</div> <div>416.03263.00001</div>	<div>Date:</div> <div>24/04/13</div>	<div>Ground Level:</div>	<div>Co-ordinates:</div>	<div>Sheet:</div> <div>1 of 1</div>

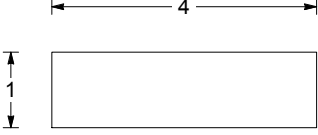
SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
1 1.00 1.00-3.00	ES	HS	3ppm				(0.70)	MADE GROUND: Pale brown slightly silty gravelly SAND. Gravel is fine to coarse angular to sub rounded concrete and slate. Rare concrete cobbles and rare vegetation noted. (SOIL AND GREEN WASTE)	
					0.70		MADE GROUND: Dark brown sandy silty clayey gravelly TOPSOIL. Gravel is concrete, brick, ceramic, slate and flint/quartzite medium to coarse angular to sub rounded. Rare concrete and brick cobbles. Locally with fine white/yellow sand. Significant vegetation inclusions of tree roots and branches up to 5cm dia. also noted.  Organic odour throughout stockpile. 0.90 Some black bag waste observed		
2 2.00		HS	2ppm				(2.30)	2.20 - 3.00 Eastern edge (centre of stockpile) becoming an ash/soil mix.	
3 3.00		HS	4ppm				3.00		Trial Pit complete at 3.00m

<p>GENERAL REMARKS:</p> <p>1. Trial Pit dry and stable whilst open.</p>		<p>Trial Pit Dimensions:</p>  <p>Shoring/Support: Stability:</p>	
<p>KEY:</p> <p>V = Hand Vane Shear Strength</p> <p>PP = Pocket Penetrometer Shear Strength</p> <p>D = Small Disturbed Sample</p> <p>B = Large Bulk Sample</p> <p>HS = Head Space Measurement</p>			
<p>All dimensions in metres</p> <p>Scale 1:25</p>	<p>Contractor :</p> <p>Plant:</p>	<p>Method: Trial Pit/trench</p>	<p>Logged By: SMJ</p> <p>Approved By: DJC</p>




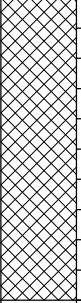
<b>TRIAL PIT LOG</b>				TRIAL PIT No <b>TP105</b>	
Client: <b>COUNCIL OF THE ISLES OF SCILLY</b>					
Project: <b>MOORWELL WASTE MANAGEMENT SITE</b>					
Project No: 416.03263.00001		Date: 24/04/13	Ground Level:	Co-ordinates:	Sheet: 1 of 1

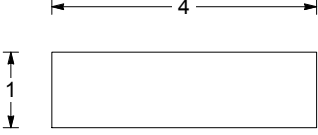
SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
1 1.00 1.00-2.00	ES	HS	1ppm				(1.00)	MADE GROUND: Dark brown gravelly silty SAND. Gravel is sub angular to sub rounded concrete and brick. Frequent fine branch and root inclusions. Rare concrete and brick cobbles, rare plastic and metal waste, rare large logs.	
							1.00	MADE GROUND: Dark brown gravelly silty SAND. Gravel is sub rounded to sub angular medium to coarse concrete and brick. Some roots and branches also noted. 1.00 - 2.00 Material noted to be slightly moist and with some cohesion.	
2 2.00		HS	1ppm				(1.00)		
							2.00		
								Trial Pit complete at 2.00m	
3									

<b>GENERAL REMARKS:</b> 1. Trial pit excavated in side of steep batter.		<b>Trial Pit Dimensions:</b> 	
<b>KEY:</b> V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement		<b>Shoring/Support:</b> Stability:	


All dimensions in metres Scale 1:25	Contractor : Plant:	Method: Trial Pit/trench	Logged By: SMJ	Approved By: DJC
--	------------------------	--------------------------	-------------------	---------------------

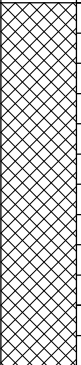
<b>TRIAL PIT LOG</b>				TRIAL PIT No <b>TP106</b>	
Client: <b>COUNCIL OF THE ISLES OF SCILLY</b>					
Project: <b>MOORWELL WASTE MANAGEMENT SITE</b>					
Project No: 416.03263.00001	Date: 24/04/13	Ground Level:	Co-ordinates:	Sheet: 1 of 1	

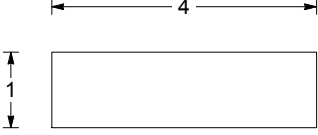
SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50	Ash	HS	1ppm				(1.00)	MADE GROUND: Dark grey/brown, fine to coarse ash with occasional fragments of metal, plastic, paper and brick/concrete cobbles, locally up to boulder size.  Topsoil/loam content increasing with depth.  One piece of asbestos sheet noted 10cm x 2cm.	
1.00	ESSoil	HS	3ppm				1.00	Trial Pit complete at 1.00m	
1									
2									
3									

<b>GENERAL REMARKS:</b> 1. Trial pit stopped at 1.0m.		<b>Trial Pit Dimensions:</b> 	
<b>KEY:</b> V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement		Shoring/Support: Stability:	


All dimensions in metres Scale 1:25	Contractor : Plant:	Method: Trial Pit/trench	Logged By: SMJ	Approved By: DJC
--	------------------------	--------------------------	-------------------	---------------------


<b>TRIAL PIT LOG</b>				TRIAL PIT No <b>TP107</b>	
Client: <b>COUNCIL OF THE ISLES OF SCILLY</b>					
Project: <b>MOORWELL WASTE MANAGEMENT SITE</b>					
Project No: 416.03263.00001	Date: 24/04/13	Ground Level:	Co-ordinates:	Sheet: 1 of 1	


SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
1	1.00	ES	HS	3ppm			(1.20) 1.20	MADE GROUND: Brown sandy silty gravelly clayey TOPSOIL with frequent (30-40%) concrete, brick, corrugated plastic, plastic, metal, paper and wood inclusions and some vegetation.  Asbestos sheet encountered - trial pit stopped.  Trial Pit complete at 1.20m	
2									
3									

<b>GENERAL REMARKS:</b> 1. Trial pit abandoned at 1.2m.		<b>Trial Pit Dimensions:</b> 	
<b>KEY:</b> V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement		<b>Shoring/Support:</b> <b>Stability:</b>	

All dimensions in metres Scale 1:25	Contractor : Plant:	Method: Trial Pit/trench	Logged By: SMJ	Approved By: DJC
--	------------------------	--------------------------	-------------------	---------------------

<div> <div>TRIAL PIT LOG</div> </div>				<div> <div>TRIAL PIT No</div> <div>TP108</div> </div>
<div> <div>Client:</div> <div>COUNCIL OF THE ISLES OF SCILLY</div> </div>				<div> <div>SLR</div>  </div>
<div> <div>Project:</div> <div>MOORWELL WASTE MANAGEMENT SITE</div> </div>				
<div> <div>Project No:</div> <div>416.03263.00001</div> </div>	<div> <div>Date:</div> <div>24/04/13</div> </div>	<div> <div>Ground Level:</div> </div>	<div> <div>Co-ordinates:</div> </div>	<div> <div>Sheet:</div> <div>1 of 1</div> </div>

SAMPLES & TESTS				Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	
1 1.00 1.00-3.00	ES	HS	1ppm			(3.00)	MADE GROUND: Slightly silty ashy SAND. Sand is medium to coarse. with frequent inclusions of concrete, bricks, ceramics, plasterboard fragments, some roots (at shallow depth), plastic piping, plastic sheeting, hose pipe, broken toilets, taps, metal pipework and slate.  Construction and demolition waste size increases with depth.	
2 2.00		HS	3ppm					
3 3.00		HS	2ppm					

<p><b>GENERAL REMARKS:</b></p> <p>1. Trial pit dry and stable whilst open.</p>	<div style="text-align: right;"> <p><b>Trial Pit Dimensions:</b></p>  </div>
<p><b>KEY:</b></p> <p>V = Hand Vane Shear Strength</p> <p>PP = Pocket Penetrometer Shear Strength</p> <p>D = Small Disturbed Sample</p> <p>B = Large Bulk Sample</p> <p>HS = Head Space Measurement</p>	<p><b>Shoring/Support:</b></p> <p><b>Stability:</b></p>


All dimensions in metres Scale 1:25	Contractor : Plant:	Method: Trial Pit/trench	Logged By: SMJ	Approved By: DJC
--	------------------------	--------------------------	-------------------	---------------------

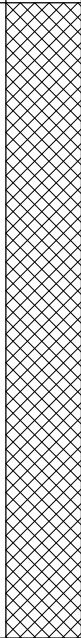


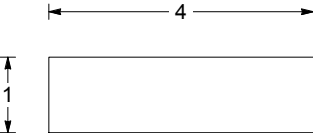
Form SLR AGS3 UK TP File 130525 416.03263.00001 MOORWELL LOGS.GPJ 18-07-13


SLR Consulting Ltd, 19 Hollingworth Court, Turkey Mill,, Maidstone, Kent, ME14 5PP, Tel: , Fax:   
 LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930

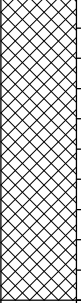


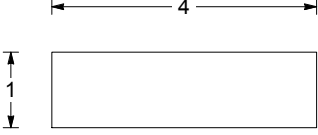
<div> <div>TRIAL PIT LOG</div> </div>				<div> <div>TRIAL PIT No</div> <div>TP110</div> </div>
<div> <div>Client:</div> <div>COUNCIL OF THE ISLES OF SCILLY</div> </div>				<div> <div>SLR</div>  </div>
<div> <div>Project:</div> <div>MOORWELL WASTE MANAGEMENT SITE</div> </div>				
<div> <div>Project No:</div> <div>416.03263.00001</div> </div>	<div> <div>Date:</div> <div>24/04/13</div> </div>	<div> <div>Ground Level:</div> </div>	<div> <div>Co-ordinates:</div> </div>	<div> <div>Sheet:</div> <div>1 of 1</div> </div>

SAMPLES & TESTS				Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	
1 1.00 1.00-2.00	ES	HS	2ppm			(2.10)	MADE GROUND: Dark grey/brown, becoming light brown fine to coarse ash with frequent weakly cemented boulders (>50cm dia). Occasional red/brown staining and sandy pockets.  Waste inclusions include metals, plastics, paper and cloth materials. Wires and copper cable. Various fragments of ceramics, crushed glass, bone and wood.	
2 2.00		HS	1ppm					2.10
3								


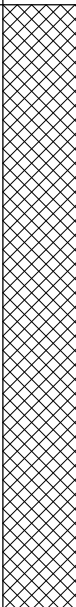
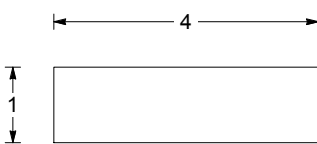
<p>GENERAL REMARKS:</p> <p>1. Trial pit abandoned at 2.1m.</p>		<p>Trial Pit Dimensions:</p>  <p>Shoring/Support: Stability:</p>	
<p>KEY:</p> <p>V = Hand Vane Shear Strength</p> <p>PP = Pocket Penetrometer Shear Strength</p> <p>D = Small Disturbed Sample</p> <p>B = Large Bulk Sample</p> <p>HS = Head Space Measurement</p>			
<p>All dimensions in metres</p> <p>Scale 1:25</p>	<p>Contractor :</p> <p>Plant:</p>	<p>Method: Trial Pit/trench</p>	<p>Logged By:</p> <p>DJC</p>
			<p>Approved By:</p> <p>DJC</p>


<b>TRIAL PIT LOG</b>				TRIAL PIT No <b>TP111</b>	
Client: <b>COUNCIL OF THE ISLES OF SCILLY</b>					
Project: <b>MOORWELL WASTE MANAGEMENT SITE</b>					
Project No: 416.03263.00001		Date: 25/04/13	Ground Level:	Co-ordinates:	Sheet: 1 of 1

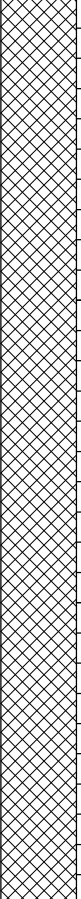
SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
1	1.00	ES	HS	7ppm			(1.00) 1.00	MADE GROUND: Dark brown clayey sandy GRAVEL. Frequent large concrete cobbles and boulders (<0.5m). Medium to coarse gravel size fragments of concrete, slate and brick. Rare plastic and metal inclusions. Frequent wood pieces. Slight organic odour throughout.	
2								Trial pit terminated due to instability. Trial Pit complete at 1.00m	
3									

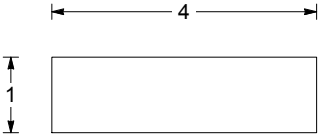
<b>GENERAL REMARKS:</b> 1. Trial pit becoming unstable abandoned at 1.0m.		<b>Trial Pit Dimensions:</b> 	
<b>KEY:</b> V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement		<b>Shoring/Support:</b> <b>Stability:</b>	

All dimensions in metres Scale 1:25	Contractor : Plant:	Method: Trial Pit/trench	Logged By: DJC	Approved By: DJC
--	------------------------	--------------------------	-------------------	---------------------


TRIAL PIT LOG										TRIAL PIT No TP112	
Client: COUNCIL OF THE ISLES OF SCILLY											
Project: MOORWELL WASTE MANAGEMENT SITE											
Project No: 416.03263.00001			Date: 25/04/13		Ground Level:		Co-ordinates:		Sheet: 1 of 1		
SAMPLES & TESTS					STRATA						
Depth	Type No	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION			Instrument/Backfill
1 1.00 1.00-2.00	ES	HS	3ppm				(2.00)	MADE GROUND: Dark brown clayey sandy GRAVEL. Frequent large concrete and granite cobbles and boulders (<0.5m). Medium to coarse gravel size fragments of concrete, slate and brick. Plastic, wood and chipboard inclusions.  Rare Asbestos cement fragments.			
2 2.00		HS	4ppm				2.00	Evidence of domestic waste below 2m.  Trial Pit complete at 2.00m			
3											
GENERAL REMARKS: 1. Trial pit dry and stable whilst open.								Trial Pit Dimensions:   Shoring/Support: Stability:			
KEY: V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement											
All dimensions in metres Scale 1:25			Contractor : Plant:			Method: Trial Pit/trench			Logged By: DJC		Approved By: DJC

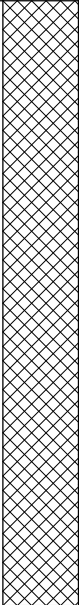
<b>TRIAL PIT LOG</b>				<b>TRIAL PIT No TP113</b>	
Client: <b>COUNCIL OF THE ISLES OF SCILLY</b>					
Project: <b>MOORWELL WASTE MANAGEMENT SITE</b>					
Project No: 416.03263.00001		Date: 25/04/13	Ground Level:	Co-ordinates:	Sheet: 1 of 1

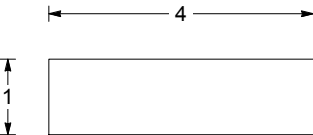
SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
1 1.00 1.00-3.00	ES	HS	2ppm				(3.00)	MADE GROUND: Dark brown clayey sandy GRAVEL. Frequent large concrete and granite cobbles and boulders (<0.5m). Medium to coarse gravel size fragments of concrete, slate and brick. Plastic, wood, chipboard, crushed plasterboard and large metal lintel.  Rare asbestos fragments noted.	
2 2.00		HS	3ppm						
3 3.00		HS	2ppm				3.00	Trial Pit complete at 3.00m	

<b>GENERAL REMARKS:</b> 1. Trial pit dry and stable whilst open.		<b>Trial Pit Dimensions:</b> 	
<b>KEY:</b> V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength D = Small Disturbed Sample B = Large Bulk Sample HS = Head Space Measurement		<b>Shoring/Support:</b> Stability:	

All dimensions in metres Scale 1:25	Contractor : Plant:	Method: Trial Pit/trench	Logged By: DJC	Approved By: DJC
--	------------------------	--------------------------	-------------------	---------------------

<div> <div>TRIAL PIT LOG</div> </div>				<div> <div>TRIAL PIT No</div> <div>TP114</div> </div>
<div> <div>Client:</div> <div>COUNCIL OF THE ISLES OF SCILLY</div> </div>				<div> <div>SLR</div>  </div>
<div> <div>Project:</div> <div>MOORWELL WASTE MANAGEMENT SITE</div> </div>				
<div> <div>Project No:</div> <div>416.03263.00001</div> </div>	<div> <div>Date:</div> <div>25/04/13</div> </div>	<div> <div>Ground Level:</div> </div>	<div> <div>Co-ordinates:</div> </div>	<div> <div>Sheet:</div> <div>1 of 1</div> </div>

SAMPLES & TESTS				Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	
1 1.00 1.00-2.00	ES	HS	2ppm			(2.00)	MADE GROUND: Dark brown clayey sandy GRAVEL with frequent large concrete and granite cobbles and boulders (<0.5m). Medium to coarse gravel size fragments of concrete, slate and brick. Plastic, wood, chipboard, crushed plasterboard.  Rare asbestos fragments.	
2 2.00		HS	3ppm			2.00	1.50 Large pocket of plasterboard and plumbing waste noted.	
3							Trial Pit complete at 2.00m	

<p>GENERAL REMARKS:</p> <p>1. Trial pit dry and stable whilst open.</p>		<p>Trial Pit Dimensions:</p>  <p>Shoring/Support: Stability:</p>	
<p>KEY:</p> <p>V = Hand Vane Shear Strength</p> <p>PP = Pocket Penetrometer Shear Strength</p> <p>D = Small Disturbed Sample</p> <p>B = Large Bulk Sample</p> <p>HS = Head Space Measurement</p>			
<p>All dimensions in metres</p> <p>Scale 1:25</p>	<p>Contractor :</p> <p>Plant:</p>	<p>Method: Trial Pit/trench</p>	<p>Logged By: DJC</p> <p>Approved By: DJC</p>



---

## **Appendix B – Laboratory Analysis – Soils**



# Jones Environmental Laboratory

Unit 3 Deeside Point  
Zone 3  
Deeside Industrial Park  
Deeside  
CH5 2UA

SLR Consulting Ltd  
19 Hollingworth Court  
Turkey Mill  
Maidstone  
ME14 5PP

Tel: +44 (0) 1244 833780  
Fax: +44 (0) 1244 833781



No.4225



**Attention :** Dan Collins  
**Date :** 23rd May, 2013  
**Your reference :** 402.0341.00017  
**Our reference :** Test Report 13/4471 Batch 1 Schedule A  
**Location :** MOORWELL  
**Date samples received :** 11th May, 2013  
**Status :** Final report  
**Issue :** 1

Twenty three samples were received for analysis on 11th May, 2013. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

## Compiled By:

**Jamie Williams B.Sc**  
**Project Co-ordinator**

**Bob Millward B.Sc**  
**Principal Chemist**

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-5	6-7	8-10	11-12	13-14	15-16	17-19	20-21	22-23	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP101	TP102	TP103	TP104	TP105	TP106	TP107	TP108	TP109	TP110			
Depth			3.5				1			2			
COC No / misc													
Containers	V J B	V J	V J	V J B	V J	V J	V J	V J B	V J	V J			
Sample Date	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013			
											LOD	Units	Method No.
Arsenic <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	13.6	NDP	NDP	<0.5	mg/kg	TM30/PM15
Barium <sup>#M</sup>	-	-	-	-	-	-	NDP	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	NDP	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	0.5	NDP	NDP	<0.1	mg/kg	TM30/PM15
Chromium <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	15.5	NDP	NDP	<0.5	mg/kg	TM30/PM15
Copper <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	70	NDP	NDP	<1	mg/kg	TM30/PM15
Lead <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	128	NDP	NDP	<5	mg/kg	TM30/PM15
Mercury <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	0.3	NDP	NDP	<0.1	mg/kg	TM30/PM15
Nickel <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	13.5	NDP	NDP	<0.7	mg/kg	TM30/PM15
Selenium <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	<1	NDP	NDP	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	NDP	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron <sup>#M</sup>	-	-	-	-	-	-	NDP	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	343	NDP	NDP	<5	mg/kg	TM30/PM15
<b>PAH MS</b>													
Naphthalene <sup>#M</sup>	<0.04	-	<0.04	<0.04	-	<0.04	-	-	0.06	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	<0.03	<0.03	-	<0.03	-	-	0.07	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene <sup>#M</sup>	<0.05	-	<0.05	<0.05	-	<0.05	-	-	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene <sup>#M</sup>	<0.04	-	<0.04	<0.04	-	<0.04	-	-	0.05	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene <sup>#M</sup>	0.03	-	0.07	0.07	-	0.10	-	-	0.60	0.07	<0.03	mg/kg	TM4/PM8
Anthracene <sup>#</sup>	<0.04	-	<0.04	<0.04	-	<0.04	-	-	0.13	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene <sup>#M</sup>	0.09	-	0.32	0.15	-	0.22	-	-	1.10	0.11	<0.03	mg/kg	TM4/PM8
Pyrene <sup>#</sup>	0.09	-	0.28	0.14	-	0.18	-	-	0.90	0.09	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene <sup>#</sup>	0.13	-	0.35	0.14	-	0.21	-	-	0.69	0.09	<0.06	mg/kg	TM4/PM8
Chrysene <sup>#M</sup>	0.12	-	0.31	0.14	-	0.17	-	-	0.60	0.07	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene <sup>#M</sup>	0.25	-	0.66	0.27	-	0.32	-	-	1.02	0.14	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene <sup>#</sup>	0.12	-	0.42	0.14	-	0.17	-	-	0.60	0.07	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene <sup>#M</sup>	0.12	-	0.29	0.10	-	0.14	-	-	0.37	0.05	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene <sup>#</sup>	<0.04	-	0.07	<0.04	-	<0.04	-	-	0.10	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene <sup>#</sup>	0.11	-	0.26	0.11	-	0.13	-	-	0.34	0.06	<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.1	-	3.0	1.3	-	1.6	-	-	6.6	0.8	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.18	-	0.48	0.19	-	0.23	-	-	0.73	0.10	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.07	-	0.18	0.08	-	0.09	-	-	0.29	0.04	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	106	-	106	102	-	102	-	-	108	104	<0	%	TM4/PM8
MTBE <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
Benzene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
Toluene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
Ethylbenzene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
m/p-Xylene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
o-Xylene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
Xylenes (sum of isomers) <sup>#</sup>	<0.01	-	<0.01	<0.01	-	<0.01	-	-	<0.01	<0.01	<0.01	mg/kg	TM31/PM12

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-5	6-7	8-10	11-12	13-14	15-16	17-19	20-21	22-23	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP101	TP102	TP103	TP104	TP105	TP106	TP107	TP108	TP109	TP110			
Depth			3.5				1			2			
COC No / misc													
Containers	V J B	V J	V J	V J B	V J	V J	V J	V J B	V J	V J			
Sample Date	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013			
											LOD	Units	Method No.
<b>Pesticides MS</b>													
<b>Organochlorine Pesticides</b>													
Aldrin	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Alpha-BHC	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Beta-BHC	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Dieldrin	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Endosulphan I	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Endosulphan II	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Endosulphan sulphate	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Endrin	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Gamma-BHC	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Heptachlor	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Heptachlor Epoxide	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
p,p'-DDE	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
p,p'-DDT	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
p,p'-TDE	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Total Methoxychlor	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
<b>Organophosphorus Pesticides</b>													
Azinphos methyl	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Diazinon	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Dichlorvos	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Disulfoton	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Ethion	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Fenitrothion	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Malathion	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Methyl Parathion	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Mevinphos	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
<b>TPH CWG</b>													
<b>Aliphatics</b>													
>C5-C6 <sup>#M</sup>	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 <sup>#M</sup>	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 <sup>#M</sup>	<0.2	-	<0.2	<0.2	-	<0.2	-	-	<0.2	<0.2	<0.2	mg/kg	TM5/PM16
>C12-C16 <sup>#M</sup>	<4	-	<4	<4	-	<4	-	-	<4	<4	<4	mg/kg	TM5/PM16
>C16-C21 <sup>#M</sup>	<7	-	<7	<7	-	<7	-	-	<7	<7	<7	mg/kg	TM5/PM16
>C21-C35 <sup>#M</sup>	<7	-	111	41	-	<7	-	-	21	<7	<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	-	111	41	-	<19	-	-	21	<19	<19	mg/kg	TM5/PM16

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-5	6-7	8-10	11-12	13-14	15-16	17-19	20-21	22-23	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP101	TP102	TP103	TP104	TP105	TP106	TP107	TP108	TP109	TP110			
Depth			3.5				1			2			
COC No / misc													
Containers	V J B	V J	V J	V J B	V J	V J	V J	V J B	V J	V J			
Sample Date	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	LOD	Units	Method No.
<b>TPH CWG</b>													
<b>Aromatics</b>													
>C5-EC7	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 <sup>#M</sup>	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 <sup>#M</sup>	<0.2	-	<0.2	<0.2	-	<0.2	-	-	<0.2	<0.2	<0.2	mg/kg	TM5/PM16
>EC12-EC16 <sup>#M</sup>	<4	-	<4	<4	-	<4	-	-	<4	<4	<4	mg/kg	TM5/PM16
>EC16-EC21 <sup>#M</sup>	<7	-	<7	<7	-	<7	-	-	<7	<7	<7	mg/kg	TM5/PM16
>EC21-EC35 <sup>#M</sup>	<7	-	76	73	-	<7	-	-	<7	<7	<7	mg/kg	TM5/PM16
Total aromatics C5-35	<19	-	76	73	-	<19	-	-	<19	<19	<19	mg/kg	TM5/PM16
Total aliphatics and aromatics(C5-35)	<38	-	187	114	-	<38	-	-	<38	<38	<38	mg/kg	TM5/PM16
<b>PCBs</b>													
PCB 77	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 81	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 105	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 114	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 118	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 123	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 126	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 156	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 157	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 167	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 169	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 189	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
Total 12 PCBs	-	-	<60	-	<60	<60	-	-	<60	-	<60	ug/kg	TM16/PM8
<b>Heavy Metals</b>													
Hexavalent Chromium	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Nitrate as NO3 <sup>#M</sup>	-	-	-	NDP	NDP	-	-	-	-	-	<2.5	mg/kg	TM38/PM20
Ortho Phosphate as PO4	-	-	-	NDP	NDP	-	-	-	-	-	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) <sup>#M</sup>	-	-	-	NDP	NDP	-	-	-	-	-	<0.0015	g/l	TM38/PM20
Total Cyanide <sup>#M</sup>	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	mg/kg	TM89/PM45
Total Organic Carbon <sup>#</sup>	-	-	NDP	NDP	-	NDP	-	1.4	-	NDP	<0.2	%	TM21/PM24
Sample Type	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Dark Brown	Dark Brown	Medium Brown	Medium Brown	Medium Brown	Dark Brown	Medium Brown	Dark Brown		None	PM13/PM0
Other Items	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	Brick/Glass Fragments		None	PM13/PM0
Chromium III	-	-	-	-	-	-	NDP	-	-	-	<0.3	mg/kg	NONE/NONE



# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	24-25,49	26-27	28-29	30-31	43-44	45-46	47-48				Please see attached notes for all abbreviations and acronyms		
Sample ID	TP111	TP112	TP113	TP114	HP115	HP116	HP117						
Depth													
COC No / misc													
Containers	V J B	V J	V J	V J	V J	V J	V J						
Sample Date	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013				LOD	Units	Method No.
Arsenic <sup>#M</sup>	NDP	NDP	NDP	13.5	10.0	16.6	NDP				<0.5	mg/kg	TM30/PM15
Barium <sup>#M</sup>	-	-	-	-	-	-	-				<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-				<0.5	mg/kg	TM30/PM15
Cadmium <sup>#M</sup>	NDP	NDP	NDP	0.2	0.5	0.4	NDP				<0.1	mg/kg	TM30/PM15
Chromium <sup>#M</sup>	NDP	NDP	NDP	11.2	13.1	11.4	NDP				<0.5	mg/kg	TM30/PM15
Copper <sup>#M</sup>	NDP	NDP	NDP	41	92	59	NDP				<1	mg/kg	TM30/PM15
Lead <sup>#M</sup>	NDP	NDP	NDP	127	143	148	NDP				<5	mg/kg	TM30/PM15
Mercury <sup>#M</sup>	NDP	NDP	NDP	0.5	0.2	0.2	NDP				<0.1	mg/kg	TM30/PM15
Nickel <sup>#M</sup>	NDP	NDP	NDP	10.1	16.2	11.0	NDP				<0.7	mg/kg	TM30/PM15
Selenium <sup>#M</sup>	NDP	NDP	NDP	<1	<1	<1	NDP				<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-				<1	mg/kg	TM30/PM15
Water Soluble Boron <sup>#M</sup>	-	-	-	-	-	-	-				<0.1	mg/kg	TM74/PM32
Zinc <sup>#M</sup>	NDP	NDP	NDP	167	261	201	NDP				<5	mg/kg	TM30/PM15
<b>PAH MS</b>													
Naphthalene <sup>#M</sup>	-	<0.04	<0.04	-	-	-	-				<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	0.05	0.03	-	-	-	-				<0.03	mg/kg	TM4/PM8
Acenaphthene <sup>#M</sup>	-	<0.05	<0.05	-	-	-	-				<0.05	mg/kg	TM4/PM8
Fluorene <sup>#M</sup>	-	0.05	<0.04	-	-	-	-				<0.04	mg/kg	TM4/PM8
Phenanthrene <sup>#M</sup>	-	0.58	0.18	-	-	-	-				<0.03	mg/kg	TM4/PM8
Anthracene <sup>#</sup>	-	0.15	0.06	-	-	-	-				<0.04	mg/kg	TM4/PM8
Fluoranthene <sup>#M</sup>	-	0.94	0.36	-	-	-	-				<0.03	mg/kg	TM4/PM8
Pyrene <sup>#</sup>	-	0.75	0.34	-	-	-	-				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene <sup>#</sup>	-	0.56	0.28	-	-	-	-				<0.06	mg/kg	TM4/PM8
Chrysene <sup>#M</sup>	-	0.45	0.23	-	-	-	-				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene <sup>#M</sup>	-	0.73	0.36	-	-	-	-				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene <sup>#</sup>	-	0.43	0.18	-	-	-	-				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene <sup>#M</sup>	-	0.27	0.16	-	-	-	-				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene <sup>#</sup>	-	0.07	<0.04	-	-	-	-				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene <sup>#</sup>	-	0.25	0.14	-	-	-	-				<0.04	mg/kg	TM4/PM8
PAH 16 Total	-	5.3	2.3	-	-	-	-				<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	0.53	0.26	-	-	-	-				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	0.20	0.10	-	-	-	-				<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	123	92	-	-	-	-				<0	%	TM4/PM8
MTBE <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
Benzene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
Toluene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
Ethylbenzene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
m/p-Xylene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
o-Xylene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
Xylenes (sum of isomers) <sup>#</sup>	-	<0.01	<0.01	-	-	-	-				<0.01	mg/kg	TM31/PM12

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	24-25,49	26-27	28-29	30-31	43-44	45-46	47-48				Please see attached notes for all abbreviations and acronyms		
Sample ID	TP111	TP112	TP113	TP114	HP115	HP116	HP117						
Depth													
COC No / misc													
Containers	V J B	V J	V J	V J	V J	V J	V J						
Sample Date	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013				LOD	Units	Method No.
<b>Pesticides MS</b>													
<b>Organochlorine Pesticides</b>													
Aldrin	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Alpha-BHC	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Beta-BHC	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Dieldrin	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Endosulphan I	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Endosulphan II	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Endosulphan sulphate	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Endrin	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Gamma-BHC	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Heptachlor	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Heptachlor Epoxide	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
p,p'-DDE	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
p,p'-DDT	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
p,p'-TDE	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Total Methoxychlor	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
<b>Organophosphorus Pesticides</b>													
Azinphos methyl	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Diazinon	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Dichlorvos	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Disulfoton	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Ethion	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Fenitrothion	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Malathion	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Methyl Parathion	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Mevinphos	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
<b>TPH CWG</b>													
<b>Aliphatics</b>													
>C5-C6 <sup>#M</sup>	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>C6-C8 <sup>#M</sup>	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>C8-C10	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>C10-C12 <sup>#M</sup>	-	<0.2	<0.2	-	-	-	-				<0.2	mg/kg	TM5/PM16
>C12-C16 <sup>#M</sup>	-	<4	18	-	-	-	-				<4	mg/kg	TM5/PM16
>C16-C21 <sup>#M</sup>	-	<7	103	-	-	-	-				<7	mg/kg	TM5/PM16
>C21-C35 <sup>#M</sup>	-	71	162	-	-	-	-				<7	mg/kg	TM5/PM16
Total aliphatics C5-35	-	71	283	-	-	-	-				<19	mg/kg	TM5/PM16

# *Jones Environmental Laboratory*

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	24-25,49	26-27	28-29	30-31	43-44	45-46	47-48				Please see attached notes for all abbreviations and acronyms		
Sample ID	TP111	TP112	TP113	TP114	HP115	HP116	HP117						
Depth													
COC No / misc													
Containers	V J B	V J	V J	V J	V J	V J	V J						
Sample Date	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013				LOD	Units	Method No.
<b>TPH CWG</b>													
<b>Aromatics</b>													
>C5-EC7	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>EC7-EC8	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>EC8-EC10 <sup>#M</sup>	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>EC10-EC12 <sup>#M</sup>	-	<0.2	<0.2	-	-	-	-				<0.2	mg/kg	TM5/PM16
>EC12-EC16 <sup>#M</sup>	-	<4	<4	-	-	-	-				<4	mg/kg	TM5/PM16
>EC16-EC21 <sup>#M</sup>	-	<7	12	-	-	-	-				<7	mg/kg	TM5/PM16
>EC21-EC35 <sup>#M</sup>	-	117	244	-	-	-	-				<7	mg/kg	TM5/PM16
Total aromatics C5-35	-	117	256	-	-	-	-				<19	mg/kg	TM5/PM16/PM20
Total aliphatics and aromatics(C5-35)	-	188	539	-	-	-	-				<38	mg/kg	TM5/PM16/PM20
<b>PCBs</b>													
PCB 77	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 81	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 105	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 114	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 118	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 123	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 126	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 156	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 157	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 167	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 169	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 189	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
Total 12 PCBs	-	-	-	-	-	-	<60				<60	ug/kg	TM16/PM8
<b>Heavy Metals</b>													
Hexavalent Chromium	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Nitrate as NO3 <sup>#M</sup>	-	-	-	-	-	-	-				<2.5	mg/kg	TM38/PM20
Ortho Phosphate as PO4	-	-	-	-	-	-	-				<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) <sup>#M</sup>	-	-	-	-	-	-	-				<0.0015	g/l	TM38/PM20
Total Cyanide <sup>#M</sup>	-	-	-	-	-	-	-				<0.5	mg/kg	TM89/PM45
Total Organic Carbon <sup>#</sup>	NDP	-	NDP	-	1.8	-	-				<0.2	%	TM21/PM24
Sample Type	Loam	Loam	Loam	Loam	Loam	Loam	Loam				None		PM13/PM0
Sample Colour	Light Brown	Medium Brown	Light Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown				None		PM13/PM0
Other Items	n.a	Stones	Stones	n.a	n.a	n.a	n.a				None		PM13/PM0
Chromium III	-	-	-	-	-	-	-				<0.3	mg/kg	NONE/NONE

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report :** CEN 10:1 1 Batch

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	6-7	13-14	20-21	26-27							Please see attached notes for all abbreviations and acronyms		
Sample ID	TP103	TP106	TP109	TP112									
Depth	3.5												
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	24/04/2013	24/04/2013	24/04/2013	25/04/2013									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013							LOD	Units	Method No.
<b>TPH CWG</b>													
<b>Aliphatics</b>													
>C5-C6	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>C6-C8	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>C8-C10	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>C10-C12	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM5/PM30
>C12-C16	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
>C16-C21	0.19	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
>C21-C35	13.26	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
Total aliphatics C5-35	13.45	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/TM36/PM30
<b>Aromatics</b>													
>C5-EC7	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>EC7-EC8	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>EC8-EC10	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>EC10-EC12	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM5/PM30
>EC12-EC16	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
>EC16-EC21	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
>EC21-EC35	0.79	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
Total aromatics C5-35	0.79	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
Total aliphatics and aromatics(C5-35)	14.24	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/TM36/PM30
Dissolved Organic Carbon	6	4	-	-							<2	mg/l	TM60/PM0
Hexavalent Chromium	<0.03	<0.03	<0.03	<0.03							<0.03	mg/l	TM38/PM0
Total Xylenes	<5	<5	<5	<5							<5	ug/l	TM15/PM10
PCB 77	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 81	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 105	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 114	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 118	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 123	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 126	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 156	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 157	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 167	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 169	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 189	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
Total 12 PCBs	<1.2	<1.2	<1.2	-							<1.2	ug/l	TM17/PM30

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins

**Note:**

Analysis was carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions lie outside the scope of our UKAS accreditation.

*Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.*

*If asbestos fibres are reported at trace levels there will not be enough fibres to quantify and will be less than 0.001%.*

Signed on behalf of Jones Environmental Laboratory:



Gemma Newsome  
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Description	Asbestos Results
13/4471	1	TP101		1-3	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundles, Soil-Silt/Stone/Brick/Trace Fibre	Amosite, Chrysotile, Crocidolite
13/4471	1	TP102		4-5	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundle, Soil-Silt/Stone/Brick/Fibre Bundles	Amosite, Chrysotile
13/4471	1	TP103	3.5	6-7	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundle, Soil-Silt/Stone/Brick/Fibre Bundles	Amosite, Chrysotile
13/4471	1	TP104		8-10	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundles	Chrysotile
13/4471	1	TP105		11-12	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundle	Chrysotile
13/4471	1	TP106		13-14	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Trace Fibres	Chrysotile
13/4471	1	TP107	1	15-16	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Fibre Bundles	Chrysotile
13/4471	1	TP108		17-19	20/05/2013	Soil-Silt/Stone/Brick/MMMF	NAD
13/4471	1	TP109		20-21	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Fibre Bundle	Chrysotile
13/4471	1	TP110	2	22-23	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Fibre Bundle	Amosite, Chrysotile
13/4471	1	TP111		24-25,49	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Fibre Bundle	Chrysotile
13/4471	1	TP112		26-27	20/05/2013	Soil-Silt/Brick/Stone/MMMF/Tile, Soil-Silt/Brick/Stone/MMMF/Trace Fibres	Amosite, Chrysotile, Crocidolite
13/4471	1	TP113		28-29	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Trace Fibres	Chrysotile
13/4471	1	TP114		30-31	20/05/2013	Soil-Silt/Stone/Brick/MMMF	NAD
13/4471	1	ASBESTOS1		41	16/05/2013	Tile-MMMF	NAD
13/4471	1	ASBESTOS2		42	16/05/2013	Tile-MMMF/Woodchip	NAD
13/4471	1	HP115		43-44	20/05/2013	Soil-Silt/Stone/Brick/MMMF	NAD
13/4471	1	HP116		45-46	20/05/2013	Soil-Silt/Stone/Brick/MMMF	NAD
13/4471	1	HP117		47-48	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Trace Fibres	Chrysotile
13/4471	1	ASBESTOS3		50	16/05/2013	Tile	Chrysotile



**Client Name:** SLR Consulting Ltd

**Matrix : Solid**

**Reference:** 402.0341.00017

**Location:** MOORWELL

**Contact:** Dan Collins

[illegible]

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 13/4471

## SOILS

Please note we are only MCERTS accredited for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. If we are instructed to keep samples, a storage charge of £1 (1.5 Euros) per sample per month will be applied until we are asked to dispose of them.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## WATERS

Please note we are not a Drinking Water Inspectorate (DWI) Approved Laboratory. It is important that detection limits are carefully considered when requesting water analysis.

UKAS accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

## SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

## NOTE

Data is only accredited when all the requirements of our Quality System have been met. In certain circumstances where the requirements have not been met, the laboratory may issue the data in an interim report but will remove the accreditation, in this instance results should be considered indicative only. Where possible samples will be re-extracted and a final report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

**ABBREVIATIONS and ACRONYMS USED**

#	UKAS accredited.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance.
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
CO	Suspected carry over
OC	Outside Calibration Range
NFD	No Fibres Detected

JE Job No 13/4471

Test Method No.	Description	Prep Method No. (if appropriate)	Description	UKAS	MCERTS (soils only)	Analysis done on As Received (AR) or Air Dried (AD)	Solid Results expressed on Dry/Wet basis
TM4	16 PAH by GC-MS, modified USEPA 8270	PM30	Magnetic stirrer extraction			AR	DRY
TM4	16 PAH by GC-MS, modified USEPA 8270	PM30	Magnetic stirrer extraction			AR	
TM4	16 PAH by GC-MS, modified USEPA 8270	PM8	End Over End extraction			AR	DRY
TM4	16 PAH by GC-MS, modified USEPA 8270	PM8	End Over End extraction	Yes		AR	DRY
TM4	16 PAH by GC-MS, modified USEPA 8270	PM8	End Over End extraction	Yes	Yes	AR	DRY
TM4	16 PAH by GC-MS, modified USEPA 8270	PM8	End Over End extraction			AR	
TM5	EPH by GC-FID, modified USEPA 8015	PM16	Aliphatic/Aromatic fractionation	Yes	Yes	AR	DRY
TM5	EPH by GC-FID, modified USEPA 8015	PM30	Magnetic stirrer extraction			AR	DRY
TM5/TM36	TPH CWG by GC-FID	PM12/PM16	CWG GC-FID			AR	DRY
TM5/TM36	TPH CWG by GC-FID	PM30	Magnetic stirrer extraction			AR	DRY
PM13	Soil Typing for MCERTS	PM0	No Preparation			AR	
TM15	VOC - Target by GC-MS, modified USEPA 8260	PM10	VOC GC-MS			AR	DRY
TM15	VOC - Target by GC-MS, modified USEPA 8260	PM10	VOC GC-MS			AR	
TM16	SVOC - Target by GC-MS, modified USEPA 8270	PM8	End Over End extraction			AR	DRY
TM17	PCB 7 Congeners and WHO 12 PCBs by GC-MS	PM30	Magnetic stirrer extraction			AR	DRY
TM21	TOC and TC by Combustion	PM24	Eltra preparation	Yes		AD	DRY
TM30	Metals by ICP-OES	PM15	Aqua Regia extraction (Soils)			AD	DRY
TM30	Metals by ICP-OES	PM15	Aqua Regia extraction (Soils)	Yes	Yes	AD	DRY
TM30	Metals by ICP-OES	PM17	CEN PR12457-2 10:1 1 batch leach	Yes		AR	DRY
TM31	BTEX/MTBE by GC-FID, modified USEPA 8015	PM12	GRO GC-FID			AR	DRY
TM31	BTEX/MTBE by GC-FID, modified USEPA 8015	PM12	GRO GC-FID	Yes		AR	DRY
TM36	GRO by Headspace GC-FID	PM12	GRO GC-FID			AR	DRY
TM36	GRO by Headspace GC-FID	PM12	GRO GC-FID	Yes	Yes	AR	DRY
TM38	SO <sub>4</sub> ,Cl,NO <sub>3</sub> ,NO <sub>2</sub> ,F,PO <sub>4</sub> , Amm N <sub>2</sub> ,ThioCN, Hex Cr by Aquakem	PM0	No Preparation			AR	DRY
TM38	SO <sub>4</sub> ,Cl,NO <sub>3</sub> ,NO <sub>2</sub> ,F,PO <sub>4</sub> , Amm N <sub>2</sub> ,ThioCN, Hex Cr by Aquakem	PM20	1:2 soil to water extraction			AD	DRY
TM38	SO <sub>4</sub> ,Cl,NO <sub>3</sub> ,NO <sub>2</sub> ,F,PO <sub>4</sub> , Amm N <sub>2</sub> ,ThioCN, Hex Cr by Aquakem	PM20	1:2 soil to water extraction	Yes	Yes	AD	DRY
TM38	SO <sub>4</sub> ,Cl,NO <sub>3</sub> ,NO <sub>2</sub> ,F,PO <sub>4</sub> , Amm N <sub>2</sub> ,ThioCN, Hex Cr by Aquakem	PM20	1:2 soil to water extraction			AR	DRY
TM42	OC and OP Pesticides by GC-MS	PM8	End Over End extraction			AR	DRY
TM60	TOC/DOC by NDIR	PM0	No Preparation			AR	DRY
TM65	Asbestos Bulk Identification	PM42	Screening of soils for fibres			AR	
TM65	Asbestos Bulk Identification	PM42	Screening of soils for fibres	Yes		AR	
TM74	Water Soluble Boron by ICP-OES	PM32	Preparation of soils for WSB	Yes	Yes	AD	DRY
TM89	Cyanide by FIA	PM45	Cyanide & Thiocyanate prep for soils	Yes	Yes	AR	DRY
NONE	No Method Code	NONE	No Method Code				DRY
NONE	No Method Code	PM4	Moisture Content			AR	



# Jones Environmental Laboratory

Unit 3 Deeside Point  
Zone 3  
Deeside Industrial Park  
Deeside  
CH5 2UA

SLR Consulting Ltd  
19 Hollingworth Court  
Turkey Mill  
Maidstone  
ME14 5PP

Tel: +44 (0) 1244 833780  
Fax: +44 (0) 1244 833781



No.4225



**Attention :** Dan Collins  
**Date :** 4th June, 2013  
**Your reference :** 402.0341.00017  
**Our reference :** Test Report 13/4471 Batch 1 Schedule C  
**Location :** MOORWELL  
**Date samples received :** 11th May, 2013  
**Status :** Final report  
**Issue :** 1

Twenty three samples were received for analysis on 11th May, 2013. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

## Compiled By:

**Jamie Williams B.Sc**  
Project Co-ordinator

**Bob Millward B.Sc**  
Principal Chemist

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms



**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.		26-27	28-29	47-48							Please see attached notes for all abbreviations and acronyms		
Sample ID		TP112	TP113	HP117									
Depth													
COC No / misc													
Containers		V J	V J	V J									
Sample Date		25/04/2013	25/04/2013	25/04/2013									
Sample Type		Soil	Soil	Soil									
Batch Number		1	1	1									
Date of Receipt		11/05/2013	11/05/2013	11/05/2013									
Arsenic	15.5	50.4	9.8								<0.5	mg/kg	TM30/PM62
Barium	-	-	-								<1	mg/kg	TM30/PM62
Beryllium	-	-	-								<0.5	mg/kg	TM30/PM62
Cadmium	0.3	0.8	0.6								<0.1	mg/kg	TM30/PM62
Chromium	11.1	71.6	9.2								<0.5	mg/kg	TM30/PM62
Copper	34	59	73								<1	mg/kg	TM30/PM62
Lead	192	163	122								<5	mg/kg	TM30/PM62
Mercury	0.2	0.2	<0.1								<0.1	mg/kg	TM30/PM62
Nickel	8.5	52.7	8.3								<0.7	mg/kg	TM30/PM62
Selenium	<1	<1	<1								<1	mg/kg	TM30/PM62
Vanadium	-	-	-								<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	-								<0.1	mg/kg	TM74/PM61
Zinc	232	173	291								<5	mg/kg	TM30/PM62
Nitrate as NO3 <sup>#M</sup>	-	-	-								<2.5	mg/kg	TM38/PM60
Ortho Phosphate as PO4	-	-	-								<0.3	mg/kg	TM38/PM60
Sulphate as SO4 (2:1 Ext) <sup>#M</sup>	-	-	-								<0.0015	g/l	TM38/PM60
Asbestos PCOM Quantification*	-	-	-								<0.001	mass %	Subcontracted

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 13/4471

## SOILS

Please note we are only MCERTS accredited for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. If we are instructed to keep samples, a storage charge of £1 (1.5 Euros) per sample per month will be applied until we are asked to dispose of them.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## WATERS

Please note we are not a Drinking Water Inspectorate (DWI) Approved Laboratory. It is important that detection limits are carefully considered when requesting water analysis.

UKAS accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

## SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

## NOTE

Data is only accredited when all the requirements of our Quality System have been met. In certain circumstances where the requirements have not been met, the laboratory may issue the data in an interim report but will remove the accreditation, in this instance results should be considered indicative only. Where possible samples will be re-extracted and a final report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

**ABBREVIATIONS and ACRONYMS USED**

#	UKAS accredited.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance.
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
CO	Suspected carry over
OC	Outside Calibration Range
NFD	No Fibres Detected

**JE Job No** 13/4471

[illegible]

---



## **Appendix C – Asbestos Air Monitoring Results**

Air Sampling & Fibre Counting								Lucion Report No.		24276						
Air Volume Correction Detail					Microscope & Calculation Detail											
Sample No. Range	Date	T Cal (K)	T Site (C)	Pcal (hPa)	Psite (hPa)	Correction Required	Sample No.Range	Date	Micro No.	Graticule Dia (µm)	Test Slide Result (Grid No.)	Filter Dia. Exposed (mm)	Field Blank	Sampled By	Counted By	
10-16	2013/04/25	293	11.9	1014	1023	None	10-16	2013/04/25	MS34	100	7	22.5	n/a	AWY	AWY	
Instrument Detail																
Thermo	WS40	Baro	WS40	Flow (Hi)	FM78	Flow (Low)	FM82	Timepiece	WS40	HSE/NPL	5739		Grat Slide	SM30		
Sample Detail																
Sample No.	Sample Location	Test Code	Head No.	Pump No.	Time On (hh:mm)	Time Off (hh:mm)	Run Time (mins)	Start Flow (lmin <sup>-1</sup> )	Int Flow (lmin <sup>-1</sup> )	End Flow (lmin <sup>-1</sup> )	Calc. Volume (l)	Corr. Volume (l)	Fibres	Fields	Calc. Conc. (Fibresml <sup>-1</sup> )	Report. Conc. (Fibresml <sup>-1</sup> )
24276-10	Adjacent construction waste stockpile during works	R	H202	SP113	10:12	10:45	33	16		16	528	528	1	200	0.000	<0.01
24276-11	Adjacent construction waste stockpile during works	R	H199	SP82	10:13	10:46	33	16		16	528	528	2	200	0.001	<0.01
24276-12	Adjacent construction waste stockpile during works	R	H116	SP77	10:14	10:47	33	16		16	528	528	1	200	0.000	<0.01
24276-13	Personal on C.Guy in digger cabin during works	P	H79	PP33	10:15	11:19	64	2		2	128	128	3	200	0.006	<0.01
24276-14	Adjacent construction waste stockpile during works	R	H199	SP113	10:50	11:20	30	16		16	480	480	4	200	0.002	<0.01
24276-15	Adjacent construction waste stockpile during works	R	H116	SP82	10:51	11:21	30	16		16	480	480	2	200	0.001	<0.01
24276-16	Adjacent construction waste stockpile during works	R	H130	SP77	10:52	11:22	30	16		16	480	480	2	200	0.001	<0.01

This air sampling report and count sheet is only valid when accompanied by a Lucion report bearing an authorised signature. Where calculated fibre concentration is below the limit of quantification of the method and sample volume (V) is less than 480 litres and/or less than 200 graticule areas (N) have been examined; the reportable concentration will be given as  $(96000 / (V \times N)) \times 0.010$ .



## AIR MONITORING REPORT

This certificate is for attention of	Dan Collins, SLR Consulting Ltd, 19 Hollingsworth Court, Turkey Mill, Ashford Road, Maidstone, ME14 5PP
Site Address	Moorwell Waste Facility, St Mary's Island, Isles of Scilly
Work Area / Description of Works	Investigation into the nature of stockpiled waste materials
Asbestos Removal Contractor	N/A
Contractor Representative On Site	Dan Collins
Outcome of Test Results	Airborne fibre levels are below 0.01f/cm <sup>3</sup> - this is below the limit of detection of the method employed
Lucion Environmental Ltd Test Report No.	24276
Report Issue Date	2013/04/24
Lucion Analyst(s) on Site	Mr Adam Yates Analyst
Lucion Analyst(s) Authorised Signature(s)	 

**Sampling & Evaluation Methods**

In-house methods TOP02.08 & TOP02.09 in accordance with HSG 248 – Asbestos: The Analyst's Guide For Sampling, Analysis and Clearance Procedures H.S.E. 2005.

**Notes:** The samples referred to in this report will be retained for 6 months unless requested otherwise. Unless otherwise stated, there are no departures from the sampling and evaluation methods specified. Results detailed in this report relate only to the time, and corresponding conditions prevailing, when the sampling and examination were undertaken.

**Notes to Test Accuracy:**

Airflow measured on site is recorded against a correction chart.

Flow meters are calibrated against a UKAS certified master flow meter accurate to  $\pm 0.5\%$ .

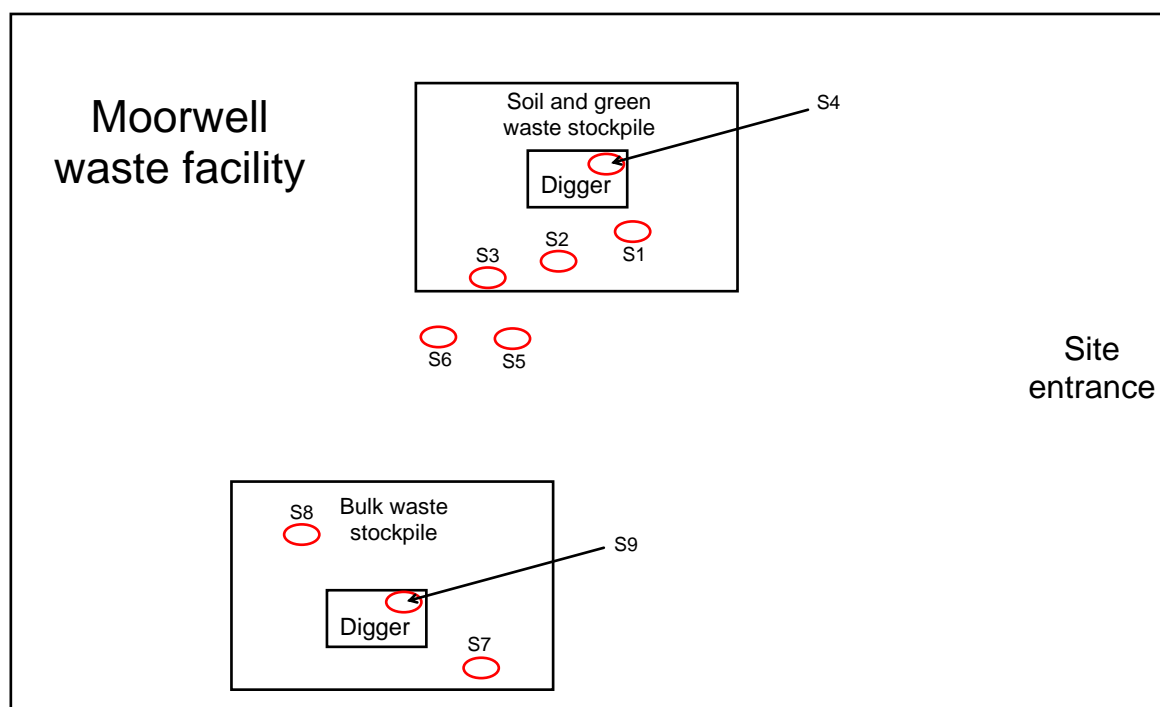
In accordance with HSG248, if the combined effect of ambient temperature and pressure between calibration and sampling location exceeds 5% a correction is applied to the air sample volume. The calculated fibre concentration is given for each air sample taken. Where the corresponding reported fibre concentration is preceded by "<", the lower limit of quantification (LOQ) of the method has not been reached. For a 480 litre air sample with 200 graticule areas counted, the (LOQ) of this method is 0.010 fibres per ml of air; samples of less volume/graticules will be reported to a lower LOQ (refer count sheet).

While counting randomly distributed fibres, an expected degree of variation of 1.5 standard deviations from the mean count may occur. At clearance indicator level (0.01 fibres per ml of air) a 480-litre air sample yielding a count of 20 fibres over 200 fields would have an expected standard deviation of  $\pm 8$  fibres.

Any opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This certificate is valid only when it bears the signature of an authorised member of Lucion personnel. Unsigned copy certificates are retained by Lucion. Refer Lucion Count Sheet Attached For Test Results

Report Attachment Summary	Yes	No	Details	
A sampling plan is attached to this report	✓			
Photograph(s) are attached to this report		✗	Photo 1	
			Photo 2	
			Photo 3	
			Photo 4	
An additional statement from the analyst is attached to this report		✗		



## Sampling Plan



The above sampling plan is NOT to scale and is intended for the purposes of showing approximate locations of air samples as reported overleaf.

## Additional Comments

## AIR MONITORING REPORT

This certificate is for attention of	Dan Collins, SLR Consulting Ltd, 19 Hollingsworth Court, Turkey Mill, Ashford Road, Maidstone, ME14 5PP
Site Address	Moorwell Waste Facility, St Mary's Island, Isles of Scilly
Work Area / Description of Works	Investigation into the nature of stockpiled waste materials
Asbestos Removal Contractor	N/A
Contractor Representative On Site	Dan Collins
Outcome of Test Results	Airborne fibre levels are below 0.01f/cm <sup>3</sup> - this is below the limit of detection of the method employed
Lucion Environmental Ltd Test Report No.	24276
Report Issue Date	2013/04/25
Lucion Analyst(s) on Site	Mr Adam Yates Analyst
Lucion Analyst(s) Authorised Signature(s)	 

**Sampling  
&  
Evaluation  
Methods**

In-house methods TOP02.08 & TOP02.09 in accordance with HSG 248 – Asbestos: The Analyst's Guide For Sampling, Analysis and Clearance Procedures H.S.E. 2005.

Notes: The samples referred to in this report will be retained for 6 months unless requested otherwise. Unless otherwise stated, there are no departures from the sampling and evaluation methods specified. Results detailed in this report relate only to the time, and corresponding conditions prevailing, when the sampling and examination were undertaken.

Notes to Test Accuracy:

Airflow measured on site is recorded against a correction chart.

Flow meters are calibrated against a UKAS certified master flow meter accurate to  $\pm 0.5\%$ .

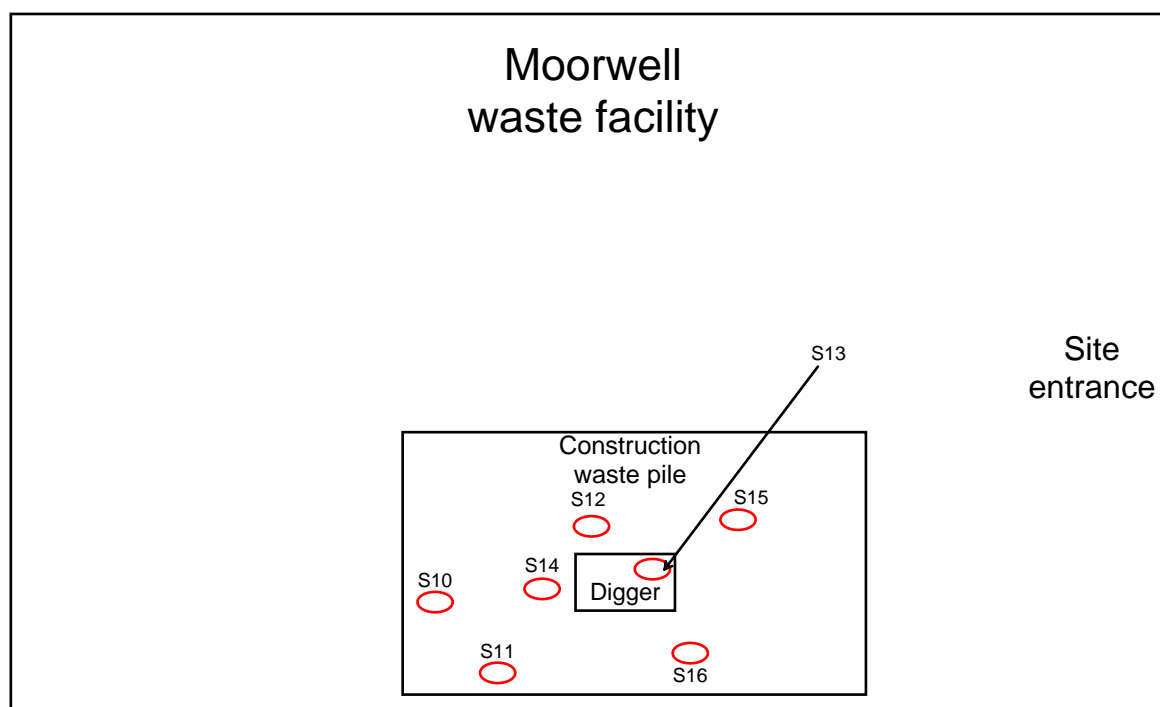
In accordance with HSG248, if the combined effect of ambient temperature and pressure between calibration and sampling location exceeds 5% a correction is applied to the air sample volume. The calculated fibre concentration is given for each air sample taken. Where the corresponding reported fibre concentration is preceded by "<", the lower limit of quantification (LOQ) of the method has not been reached. For a 480 litre air sample with 200 graticule areas counted, the (LOQ) of this method is 0.010 fibres per ml of air; samples of less volume/graticules will be reported to a lower LOQ (refer count sheet).

While counting randomly distributed fibres, an expected degree of variation of 1.5 standard deviations from the mean count may occur. At clearance indicator level (0.01 fibres per ml of air) a 480-litre air sample yielding a count of 20 fibres over 200 fields would have an expected standard deviation of  $\pm 8$  fibres.

Any opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This certificate is valid only when it bears the signature of an authorised member of Lucion personnel. Unsigned copy certificates are retained by Lucion. Refer Lucion Count Sheet Attached For Test Results

Report Attachment Summary	Yes	No	Details	
A sampling plan is attached to this report	✓			
Photograph(s) are attached to this report		✗	Photo 1	
			Photo 2	
			Photo 3	
			Photo 4	
An additional statement from the analyst is attached to this report		✗		

## Sampling Plan



The above sampling plan is NOT to scale and is intended for the purposes of showing approximate locations of air samples as reported overleaf.

## Additional Comments

Air Sampling & Fibre Counting								Lucion Report No.		24276						
Air Volume Correction Detail					Microscope & Calculation Detail											
Sample No. Range	Date	T Cal (K)	T Site (C)	Pcal (hPa)	Psite (hPa)	Correction Required	Sample No.Range	Date	Micro No.	Graticule Dia (µm)	Test Slide Result (Grid No.)	Filter Dia. Exposed (mm)	Field Blank	Sampled By	Counted By	
1-9	2013/04/24	293	14.1	1014	1026	None	1-9	2013/04/24	MS34	100	7	22.5	n/a	AWY	AWY	
Instrument Detail																
Thermo	WS40	Baro	WS40	Flow (Hi)	FM78	Flow (Low)	FM82	Timepiece	WS40	HSE/NPL	5739		Grat Slide	SM30		
Sample Detail																
Sample No.	Sample Location	Test Code	Head No.	Pump No.	Time On (hh:mm)	Time Off (hh:mm)	Run Time (mins)	Start Flow (lmin <sup>-1</sup> )	Int Flow (lmin <sup>-1</sup> )	End Flow (lmin <sup>-1</sup> )	Calc. Volume (l)	Corr. Volume (l)	Fibres	Fields	Calc. Conc. (Fibresml <sup>-1</sup> )	Report. Conc. (Fibresml <sup>-1</sup> )
24276-1	Adjacent soil and green waste stockpile during works	R	H202	SP113	13:28	14:02	34	16		16	544	544	2	200	0.001	<0.01
24276-2	Adjacent soil and green waste stockpile during works	R	H199	SP82	13:29	14:03	34	16		16	544	544	2	200	0.001	<0.01
24276-3	Adjacent soil and green waste stockpile during works	R	H130	SP77	13:30	14:04	34	16		16	544	544	1	200	0.000	<0.01
24276-4	Personal on C.Guy in digger cabin during works	P	H116	PP33	13:31	14:47	76	2		2	152	152	3.5	200	0.006	<0.03
24276-5	Adjacent soil and greenwaste stockpile during works	R	H202	SP113	14:12	14:43	31	16		16	496	496	1	200	0.001	<0.01
24276-6	Adjacent soil and greenwaste stockpile during works	R	H79	SP82	14:13	14:44	31	16		16	496	496	0.5	200	0.000	<0.01
24276-7	Adjacent bulk waste stockpile during works	R	H116	SP113	15:33	16:09	36	16		16	576	576	4	200	0.002	<0.01
24276-8	Adjacent bulk waste stockpile during works	R	H79	SP77	15:34	16:10	36	16		16	576	576	2	200	0.001	<0.01
24276-9	Personal on C.Guy in digger cabin during works	P	H	PP33	15:35	16:48	73	2		2	146	146	4.5	200	0.008	<0.02

This air sampling report and count sheet is only valid when accompanied by a Lucion report bearing an authorised signature. Where calculated fibre concentration is below the limit of quantification of the method and sample volume (V) is less than 480 litres and/or less than 200 graticule areas (N) have been examined; the reportable concentration will be given as  $(96000 / (V \times N)) \times 0.010$ .

---

## **Appendix D – Laboratory Analysis – Groundwater**





# Jones Environmental Laboratory

Unit 3 Deeside Point  
Zone 3  
Deeside Industrial Park  
Deeside  
CH5 2UA

SLR Consulting Ltd  
19 Hollingworth Court  
Turkey Mill  
Maidstone  
ME14 5PP

Tel: +44 (0) 1244 833780  
Fax: +44 (0) 1244 833781



No.4225

<b>Attention :</b>	Dan Collins
<b>Date :</b>	30th May, 2013
<b>Your reference :</b>	402.0341.00017
<b>Our reference :</b>	Test Report 13/4471 Batch 1 Schedule B
<b>Location :</b>	MOORWELL
<b>Date samples received :</b>	11th May, 2013
<b>Status :</b>	Final report
<b>Issue :</b>	1

Twenty three samples were received for analysis on 11th May, 2013. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

## Compiled By:

**Jamie Williams B.Sc**  
**Project Co-ordinator**

**Bob Millward B.Sc**  
**Principal Chemist**

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd

**Report : Liquid**

**Reference:** 402.0341.00017

**Location:** MOORWELL

**Contact:** Dan Collins

**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle

**JE Job No.:** 13/4471

H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HN0<sub>3</sub>

J E Sample No.	32-34	35-37	38-40								Please see attached notes for all abbreviations and acronyms		
Sample ID	BHL	BHK	BHM										
Depth													
COC No / misc													
Containers	V G	V G	V G										
Sample Date	25/04/2013	25/04/2013	25/04/2013										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1								LOD	Units	Method No.
Date of Receipt	11/05/2013	11/05/2013	11/05/2013										
Dissolved Aluminium #	<0.0015	0.0198	<0.0015								<0.0015	mg/l	TM30/PM14
Dissolved Antimony #	<0.002	<0.002	<0.002								<0.002	mg/l	TM30/PM14
Dissolved Arsenic #	0.0076	0.0079	0.0066								<0.0009	mg/l	TM30/PM14
Dissolved Barium #	0.0176	0.0190	0.0254								<0.0018	mg/l	TM30/PM14
Dissolved Beryllium	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM30/PM14
Dissolved Boron	0.138	0.204	0.286								<0.002	mg/l	TM30/PM14
Dissolved Cadmium #	<0.00003	<0.00003	<0.00003								<0.00003	mg/l	TM30/PM14
Total Dissolved Chromium #	0.0009	0.0008	0.0009								<0.0002	mg/l	TM30/PM14
Dissolved Cobalt #	<0.0001	0.0008	0.0002								<0.0001	mg/l	TM30/PM14
Dissolved Copper #	<0.003	<0.003	0.009								<0.003	mg/l	TM30/PM14
Total Dissolved Iron #	0.0396	0.0892	<0.0047								<0.0047	mg/l	TM30/PM14
Dissolved Lead #	0.0056	0.0047	0.0069								<0.0004	mg/l	TM30/PM14
Dissolved Manganese #	0.6769	0.3789	0.1641								<0.0015	mg/l	TM30/PM14
Dissolved Mercury #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM30/PM14
Dissolved Molybdenum #	0.0065	0.0096	0.0117								<0.0002	mg/l	TM30/PM14
Dissolved Nickel #	0.0008	<0.0002	0.0014								<0.0002	mg/l	TM30/PM14
Dissolved Phosphorus #	0.0092	0.0034	0.0054								<0.0007	mg/l	TM30/PM14
Dissolved Selenium #	<0.0012	<0.0012	<0.0012								<0.0012	mg/l	TM30/PM14
Dissolved Vanadium #	<0.0006	<0.0006	<0.0006								<0.0006	mg/l	TM30/PM14
Dissolved Zinc #	0.0159	0.0077	0.0792								<0.0015	mg/l	TM30/PM14
Total Hardness Dissolved (as CaCO <sub>3</sub> )	290	207	95								<1	mg/l	TM30/PM0
<b>Pesticides MS</b>													
<b>Organochlorine Pesticides</b>													
Aldrin	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Alpha-BHC	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Beta-BHC	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Dieldrin	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Endosulphan I	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Endosulphan II	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Endosulphan sulphate	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Endrin	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Gamma-BHC	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Heptachlor	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Heptachlor Epoxide	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
p,p'-DDE	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
p,p'-DDT	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
p,p'-TDE	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30
Total Methoxychlor	<0.00001	<0.00001	<0.00001								<0.00001	mg/l	TM42/PM30

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Liquid**

**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle  
H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HNO<sub>3</sub>

J E Sample No.	32-34	35-37	38-40								Please see attached notes for all abbreviations and acronyms			
Sample ID	BHL	BHK	BHM											
Depth														
COC No / misc														
Containers	V G	V G	V G											
Sample Date	25/04/2013	25/04/2013	25/04/2013											
Sample Type	Ground Water	Ground Water	Ground Water											
Batch Number	1	1	1											
Date of Receipt	11/05/2013	11/05/2013	11/05/2013											
												LOD	Units	Method No.
Pesticides MS														
Organophosphorus Pesticides														
Azinphos methyl	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Diazinon	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Dichlorvos	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Disulfoton	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Ethion	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Ethyl Parathion (Parathion)	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Fenitrothion	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Malathion	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Methyl Parathion	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Mevinphos	<0.00001	<0.00001	<0.00001									<0.00001	mg/l	TM42/PM30
Sulphate #	91.61	95.11	66.36									<0.05	mg/l	TM38/PM0
Chloride #	380.0	335.4	136.2									<0.3	mg/l	TM38/PM0
Nitrate as NO3 #	1.3	0.7	11.5									<0.2	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	<0.03	0.41	<0.03									<0.03	mg/l	TM38/PM0
Electrical Conductivity @25C #	1588	1379	786									<2	uS/cm	TM76/PM0
pH #	6.76	6.13	6.70									<0.01	pH units	TM73/PM0
Dissolved Titanium	<0.005	<0.005	<0.005									<0.005	mg/l	TM30/PM14

Client Name: SLR Consulting Ltd

SVOC Report : Liquid

Reference: 402.0341.00017

Location: MOORWELL

Contact: Dan Collins

JE Job No.: 13/4471

J E Sample No.	32-34	35-37	38-40								Please see attached notes for all abbreviations and acronyms		
Sample ID	BHL	BHK	BHM										
Depth													
COC No / misc													
Containers	V G	V G	V G										
Sample Date	25/04/2013	25/04/2013	25/04/2013										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	11/05/2013	11/05/2013	11/05/2013								LOD	Units	Method No.
<b>SVOC MS</b>													
<b>Phenols</b>													
2-Chlorophenol #	<0.001	<0.001	<0.001								<0.001	mg/l	TM16/PM30
2-Methylphenol #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
2-Nitrophenol #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
2,4-Dichlorophenol #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
2,4-Dimethylphenol	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
2,4,6-Trichlorophenol	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
4-Methylphenol	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
4-Nitrophenol	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
Pentachlorophenol	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
Phenol	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
<b>PAHs</b>													
2-Chloronaphthalene #	<0.001	<0.001	<0.001								<0.001	mg/l	TM16/PM30
2-Methylnaphthalene #	<0.001	<0.001	<0.001								<0.001	mg/l	TM16/PM30
Naphthalene #	<0.001	<0.001	<0.001								<0.001	mg/l	TM16/PM30
Acenaphthylene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
Acenaphthene #	<0.001	<0.001	<0.001								<0.001	mg/l	TM16/PM30
Fluorene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
Phenanthrene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
Anthracene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
Fluoranthene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
Pyrene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
Benzo(a)anthracene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
Chrysene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
Benzo(bk)fluoranthene #	<0.001	<0.001	<0.001								<0.001	mg/l	TM16/PM30
Benzo(a)pyrene	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
Indeno(123cd)pyrene	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
Dibenzo(ah)anthracene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
Benzo(ghi)perylene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM16/PM30
<b>Phthalates</b>													
Bis(2-ethylhexyl) phthalate	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
Butylbenzyl phthalate	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
Di-n-butyl phthalate #	<0.0015	<0.0015	<0.0015								<0.0015	mg/l	TM16/PM30
Di-n-Octyl phthalate	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30
Diethyl phthalate #	<0.001	<0.001	<0.001								<0.001	mg/l	TM16/PM30
Dimethyl phthalate	<0.01	<0.01	<0.01								<0.01	mg/l	TM16/PM30

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

Please see attached notes for all abbreviations and acronyms

QF-PM 3.1.3 v10

# Jones Environmental Laboratory

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**VOC Report :** Liquid

J E Sample No.	32-34	35-37	38-40										
Sample ID	BHL	BHK	BHM										
Depth													
COC No / misc													
Containers	V G	V G	V G										
Sample Date	25/04/2013	25/04/2013	25/04/2013										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	11/05/2013	11/05/2013	11/05/2013										
											LOD	Units	Method No.
Please see attached notes for all abbreviations and acronyms													
<b>VOC MS</b>													
Dichlorodifluoromethane	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.0001	<0.0001	<0.0001								<0.0001	mg/l	TM15/PM10
Chloromethane #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
Vinyl Chloride	<0.0001	<0.0001	<0.0001								<0.0001	mg/l	TM15/PM10
Bromomethane	<0.001	<0.001	<0.001								<0.001	mg/l	TM15/PM10
Chloroethane #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
Trichlorofluoromethane #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
Dichloromethane (DCM) #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
trans-1-2-Dichloroethene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,1-Dichloroethane #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
cis-1-2-Dichloroethene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
2,2-Dichloropropane	<0.001	<0.001	<0.001								<0.001	mg/l	TM15/PM10
Bromochloromethane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Chloroform #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
1,1,1-Trichloroethane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
1,1-Dichloropropene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
Carbon tetrachloride #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
1,2-Dichloroethane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Benzene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM15/PM10
Trichloroethene (TCE) #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,2-Dichloropropane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Dibromomethane #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
Bromodichloromethane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
cis-1-3-Dichloropropene	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Toluene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM15/PM10
trans-1-3-Dichloropropene	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
1,1,2-Trichloroethane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Tetrachloroethene (PCE) #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,3-Dichloropropane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Dibromochloromethane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
1,2-Dibromoethane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Chlorobenzene #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Ethylbenzene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM15/PM10
p/m-Xylene #	<0.001	<0.001	<0.001								<0.001	mg/l	TM15/PM10
o-Xylene #	<0.0005	<0.0005	<0.0005								<0.0005	mg/l	TM15/PM10
Styrene	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Bromoform #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
Isopropylbenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<0.004	<0.004	<0.004								<0.004	mg/l	TM15/PM10
Bromobenzene #	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
1,2,3-Trichloropropane #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
Propylbenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
2-Chlorotoluene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,3,5-Trimethylbenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
4-Chlorotoluene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
tert-Butylbenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,2,4-Trimethylbenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
sec-Butylbenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
4-Isopropyltoluene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,3-Dichlorobenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,4-Dichlorobenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
n-Butylbenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,2-Dichlorobenzene #	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
1,2,4-Trichlorobenzene	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
Hexachlorobutadiene	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
Naphthalene	<0.002	<0.002	<0.002								<0.002	mg/l	TM15/PM10
1,2,3-Trichlorobenzene	<0.003	<0.003	<0.003								<0.003	mg/l	TM15/PM10
Surrogate Recovery Toluene D8	84	94	93								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	95	105	99								<0	%	TM15/PM10

Please include all sections of this report if it is reproduced



# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 13/4471

## SOILS

Please note we are only MCERTS accredited for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. If we are instructed to keep samples, a storage charge of £1 (1.5 Euros) per sample per month will be applied until we are asked to dispose of them.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## WATERS

Please note we are not a Drinking Water Inspectorate (DWI) Approved Laboratory. It is important that detection limits are carefully considered when requesting water analysis.

UKAS accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

## SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

## NOTE

Data is only accredited when all the requirements of our Quality System have been met. In certain circumstances where the requirements have not been met, the laboratory may issue the data in an interim report but will remove the accreditation, in this instance results should be considered indicative only. Where possible samples will be re-extracted and a final report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

**ABBREVIATIONS and ACRONYMS USED**

#	UKAS accredited.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance.
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
CO	Suspected carry over
OC	Outside Calibration Range
NFD	No Fibres Detected

**JE Job No** 13/4471

[illegible]

---

## **Appendix E – Generic Assessment Criteria**

**SLR VERSION 4b. 'GENERIC ASSESSMENT CRITERIA' (mg/kg)**

Chemical	GAC Source	SOM	Residential with plant uptake	Residential without plant uptake	Allotments	Commercial/ Industrial
METALS						
Arsenic	SGV (2009)		32	35	43	640
Mercury – Inorganic (Elemental)	SGV (2009)		170 (1.0)	240	80 (26)	3,600 (26)
Nickel	SGV (2009)		130	130	230	1,800
Selenium	SGV (2009)		350	600	120	13,000
Cadmium	SGV (2009)		10	18	1.8	230
Lead	SLR		290	340	250	5,700
Chromium (VI)	LQM/CIEH (2009)		4.3		2.1	35
Chromium (III)			3,000		35,000	30,000
Copper	LQM/CIEH (2009)		2,330		524	72,000
Zinc	LQM/CIEH (2009)		3,750		618	670,000
Vanadium	LQM/CIEH (2009)		75		18	3,200
Beryllium	LQM/CIEH (2009)		51		55	420
Boron	LQM/CIEH (2009)		291		45	192,000
ORGANICS						
Phenol	SGV (2009)	1%	180	310	66	3,200 <sup>#</sup>
		3%	320	440	160	
		6%	420	520	280	
BTEX COMPOUNDS						
Benzene	SGV (2009)	1%	0.079	0.27	0.017	28
		3%	0.18	0.56	0.04	57
		6%	0.33	1.0	0.07	95
Toluene	SGV (2009)	1%	119	607	22	869
		3%	319	1,510	61	2,300
		6%	610	2,710	120	4,400
Ethylbenzenes	SGV (2009)	1%	65	167	16	518
		3%	183	451	46	1,500
		6%	350	843	90	2,800

Chemical	GAC Source	SOM	Residential with plant uptake	Residential without plant uptake	Allotments	Commercial/ Industrial
Xylene	SGV (2009)	1%	42	53	29	576
		3%	117	148	83	1,610
		6%	230	288	160	2,600
POLYCYCLIC AROMATIC HYDROCARBONS						
Threshold Toxicity PAHs						
Acenaphthene	LQM/CIEH (2009)	1%	210		34	≥5,000*
		2.5%	480		85	
		6%	1000		200	
Acenaphthylene	LQM/CIEH (2009)	1%	170		28	≥5,000*
		2.5%	400		69	
		6%	850		160	
Anthracene	LQM/CIEH (2009)	1%	2,300		380	≥5,000*
		2.5%	4,900		950	
		6%	9,200		2,200	
Fluoranthene	LQM/CIEH (2009)	1%	260		52	≥5,000*
		2.5%	460		130	
		6%	670		290	
Fluorene	LQM/CIEH (2009)	1%	160		27	≥5,000*
		2.5%	380		67	
		6%	780		160	
Naphthalene	SLR	1%	10	16	4.1	76
		3%	29	45	12	219
		6%	56	87	23	432
Phenanthrene	LQM/CIEH (2009)	1%	92		16	≥5,000*
		2.5%	200		38	
		6%	380		90	
Pyrene	LQM/CIEH (2009)	1%	560		110	≥5,000*
		2.5%	1,000		270	
		6%	1,600		620	
Non-threshold Toxicity PAHs						
Benz(a)anthracene	LQM/CIEH (2009)	1%	3.1		2.5	90
		2.5%	4.7		5.5	95
		6%	5.9		10	97
Benzo(a)Pyrene	SLR	1%	1	1	1.1	14
		3%			1.6	
		6%			1.8	
Benzo(b)fluoranthene	LQM/CIEH (2009)	1%	5.6		3.5	
		2.5%	6.5		7.4	100
		6%	7.0		13	



Chemical	GAC Source	SOM	Residential with plant uptake	Residential without plant uptake	Allotments	Commercial/ Industrial
Benzo(k)fluoranthene	LQM/CIEH (2009)	1%	10		6.8	140
		2.5%			14	
		6%			23	
Benzo(ghi)perylene	LQM/CIEH (2009)	1%	44		70	650
		2.5%	46		120	
		6%	47		160	
Chrysene	LQM/CIEH (2009)	1%	6.0		2.6	140
		2.5%	8.0		5.8	
		6%	9.3		12	
Dibenz(ah)anthracene	LQM/CIEH (2009)	1%	1		0.8	13
		2.5%			1.5	
		6%			2.3	
Indeno(123-cd)pyrene	LQM/CIEH (2009)	1%	3.2		1.8	60
		2.5%	3.9		3.8	
		6%	4.2		7.1	

#### PETROLEUM HYDROCARBON FRACTIONS

Aliphatic EC 5-6	MVDC/SLR (2009)	1%	62	62	≥800*	300
		3%	130	131		632
		6%	233	234		≥800*
Aliphatic EC>6-8	MVDC/SLR (2009)	1%	150	150	≥800*	150
		3%	400	400		400
		6%	770	770		770
Aliphatic EC>8-10	MVDC/SLR (2009)	1%	38	39	664	82
		3%	111	112	≥800*	240
		6%	219	220		480
Aliphatic EC>10-12	MVDC/SLR (2009)	1%	50	50	≥800*	50
		3%	150	150		150
		6%	300	300		300
Aliphatic EC>12-16	MVDC/SLR (2009)	1%	1,250	1,250	2,060	≥5,000*
		3%	2,920	2,930	≥3,500*	
		6%	≥3,500*	≥3,500*		
Aliphatic EC>16-35	MVDC/SLR (2009)		≥3,500*	≥3,500*	≥3,500*	≥5,000*
Aliphatic EC>35-44	MVDC/SLR (2009)		≥10,000*	≥10,000*	≥10,000*	≥10,000*

Chemical	GAC Source	SOM	Residential with plant uptake	Residential without plant uptake	Allotments	Commercial/Industrial
Aromatic EC>8-10	MVDC/SLR (2009)	1%	37	43	42	620
		3%	109	125	125	≥800*
		6%	214	245	248	
Aromatic EC>10-12	MVDC/SLR (2009)	1%	83.1	218	19	370
		3%	234	557	56	≥800*
		6%	431	≥800*	112	
Aromatic EC>12-16	MVDC/SLR (2009)	1%	197	1,560	34	≥5,000*
		3%	513	2,150	101	
		6%	858	2,370	199	
Aromatic EC>16-21	MVDC/SLR (2009)	1%	541	2,650	102	≥5,000*
		3%	1,150		297	
		6%	1,600		574	
Aromatic EC>21-35	MVDC/SLR (2009)	1%	1,770	2,670	745	≥5,000*
		3%	2,270		1,900	
		6%	2,450		3,100	
Aromatic EC>35-44	MVDC/SLR (2009)	1%	1,780	2,670	747	≥10,000*
		3%	2,280		1,900	
		6%	2,450		3,100	
Aliphatic & Aromatic EC>44-70	MVDC/SLR (2009)	1%	2,360	2,670	2,360	≥10,000*
		3%	2,550		≥10,000*	
		6%	2,600			

**Notes:**

1. Generic assessment criteria in mg/kg dry weight in soil
2. SGV - Soil Guideline Value reports, EA 2009. Refer to relevant "SGV" or "Tox" report for further details
3. Based on sandy loam soil as defined in CLEA report
4. Chromium is assumed to be all Chromium (VI)
5. No GAC is pH influenced
6. SLR – Version 4a 'SLR in-house criteria' produced using CLEA model (v1.04)
7. SOM – Soil Organic Matter Content
8. 500 – Health based criteria generated using the CLEA model v1.04 are considerably higher than these values; the values reported are theoretical soil saturation limits, particularly where vapour pathway is critical for volatile contaminants
9. \* – Health based criteria generated using the CLEA model v1.04 are considerably higher than these values, the values reported are based on Canadian 'management limits' for petroleum hydrocarbons in fine grained soils (CCME, 2008). The management limit for CCME fraction 1 (800 mg/kg) is adopted for petrol range organics (PRO); the management limits for fraction 3 are adopted for DRO, i.e. 3,500 mg/kg for agricultural/residential land use and 5,000 mg/kg for commercial/industrial; and the management limit for fraction 4 (10,000 mg/kg) is adopted for EC>35. CCME management limits are based on free phase formation, exposure of workers in trenches, fire and explosive hazards, effects on buried infrastructure, aesthetic considerations and technological factors.
10. # - SGV based on phenol concentration potentially corrosive to skin

This table constitutes the fourth release (i.e. Version 4) of 'generic assessment criteria' (GAC) to be used by SLR staff for screening purposes in the generic quantitative risk assessment of potentially contaminated land. The values contained in the table are comprised of:

- Revised 'Soil Guideline Values' (SGVs) published to date by the Environment Agency during 2009;
- Generic Assessment Criteria published by Land Quality Management and the Chartered Institute of Environmental Health (LQM/CIEH, 2009); and
- SLR-generated values, derived using the CLEA v1.04 model (released by the Environment Agency in January 2009).

'SLR' values have been generated following the approaches recommended in the CLEA Report (EA, 2009a) and associated material (CLEA software Handbook; EA, 2009b) and are therefore based on health criteria values selected following the TOX Guidance Report (EA, 2009c). Physico-chemical input parameters for the CLEA v1.04 model were selected from Environment Agency publications (e.g. previous SGV reports and EA, 2009d), where available, and other authoritative data sources<sup>1</sup>.

It should be noted that a number of the GAC derived by LQM/CIEH and SLR are populated by input parameter values taken from the Agency's SGV and TOX reports published between 2002 and 2005. The Environment Agency is currently undertaking a programme to update these reports, which are due to be reissued throughout 2009. This program is likely to result in changes to the values recommended in the TOX and SGV reports with the effect that published SGVs and re-calculated GACs may be different to the values detailed here. The results of an assessment based on these criteria could therefore be re-evaluated in light of any future changes.

Petroleum hydrocarbon contamination should be assessed using GAC for indicator compounds (i.e. BTEX compounds, benzo[a]pyrene and naphthalene) in conjunction with the values detailed above for hydrocarbon transport fractions. An additive 'Hazard Index' approach should be employed for the assessment of threshold effect hydrocarbons (i.e. the fractions and TEX). No values are presented for transport fractions 'aromatic EC 5-7' and 'aromatic EC>7-8' as these are comprised solely of benzene and toluene, respectively, and are assessed by consideration of these indicator compounds. Similarly, it is possible to subtract the concentrations of ethylbenzene and 'total xylenes' from the 'aromatic EC>8-10' fraction to avoid double-counting.

GAC for petroleum hydrocarbons have been derived using health criteria, soil vapour saturation limits where inhalation exposure is the critical pathway and the application of CCME management limit values based on criteria including visual aesthetics (e.g. staining of soil), fire and explosive risks, risks to ground workers and technological factors (CCME, 2008).

An additive hazard index approach should also be used for risk assessment of the non-threshold PAHs (i.e. those compounds judged to be genotoxic carcinogens). Threshold effect PAHs with similar health endpoints should also be considered to be additive.

This table of GAC are for use within SLR only and will added to as further SGV/GACs are published by the Environment Agency and LQM/CIEH and values are generated in-

---

<sup>1</sup> E.g. CRC Handbook of Chemistry and Physics, IUPAC-NIST Solubility Series and US Environmental Protection Agency.

house for additional contaminants. Future releases will be labelled Version 5, 6....etc. and will supersede all previous versions.

## **References**

Environment Agency (2009a) Updated Technical Background to the CLEA model, Science Report SC050021/SR3. Bristol: Environment Agency.

Environment Agency (2009b) CLEA Software (Version 1.04) Handbook, Science Report SC050021/SR4. Bristol: Environment Agency.

Environment Agency (2009c) Human Health Toxicological Assessment of Contaminants in Soil, Science Report SC050021/SR2. Bristol: Environment Agency.

Environment Agency (2009d) Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values. Science Report SC050021/SR7. Bristol: Environment Agency

CCME (2008) Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil: Scientific Rationale – Supporting Technical Document, PN 1399, ISBN 978-1-896997-77-3. Canadian Council of Ministers of the Environment, January 2008.

LQM/CIEH (2009) The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2<sup>nd</sup> Edition). Land Quality Press, Nottingham. ISBN 0-9547474-7-X

Mole Valley District Council and SLR Consulting (2009) Human Health Generic Assessment Criteria for Petroleum Hydrocarbons: Position Paper. Available at <http://www.mole-valley.gov.uk/index.cfm?articleid=562>

---

## **Appendix F – Waste Classification Results**

### Job name

Moorwell with moisture contents

### Waste stream

Revised Contaminated Land

### Comments

### Report

Created by: Hills, Toby

Created date: 19/06/2013 15:47

### Job summary

#	Sample name	Depth	Classification result	Hazardous properties
1	TP101		Non Hazardous	
2	TP102		Non Hazardous	
3	TP103	3.5	Non Hazardous	
4	TP104		Non Hazardous	
5	TP105		Non Hazardous	
6	TP106		Non Hazardous	
7	TP107	1	Non Hazardous	
8	TP108		Non Hazardous	
9	TP109		Non Hazardous	
10	TP110	2	Non Hazardous	
11	TP111		Non Hazardous	
12	TP112		Non Hazardous	
13	TP113		Non Hazardous	
14	TP114		Non Hazardous	
15	HP115		Non Hazardous	
16	HP116		Non Hazardous	
17	HP117		Non Hazardous	



## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP101**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**5.2%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.109%)

## Determinands (Dry Weight Moisture Content: 5.2%)

Arsenic trioxide: (Cation conc. entered: 17.5 mg/kg, converted to compound conc.:21.964 mg/kg or 0.0022%)

Cadmium sulphide: (Cation conc. entered: 5.4 mg/kg, converted to compound conc.:6.597 mg/kg or 0.00066%)

Chromium(III) oxide: (Cation conc. entered: 55.6 mg/kg, converted to compound conc.:77.246 mg/kg or 0.00772%)

Copper (I) oxide: (Cation conc. entered: 837 mg/kg, converted to compound conc.:895.788 mg/kg or 0.0896%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 761 mg/kg, converted to compound conc.:1092.31 mg/kg or 0.109%)

Mercury dichloride: (Cation conc. entered: 1.3 mg/kg, converted to compound conc.:1.673 mg/kg or 0.000167%)

Nickel dihydroxide: (Cation conc. entered: 61.3 mg/kg, converted to compound conc.:92.037 mg/kg or 0.0092%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.426 mg/kg or <0.000143%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 1987 mg/kg, converted to compound conc.:2350.995 mg/kg or 0.235%)

Naphthalene: (Whole concentration entered as: <0.04 mg/kg or <0.0000038%) **IGNORED Because: "<LOD"**

Acenaphthylene: (Whole concentration entered as: <0.03 mg/kg or <0.00000285%) **IGNORED Because: "<LOD"**

Acenaphthene: (Whole concentration entered as: <0.05 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Fluorene: (Whole concentration entered as: <0.04 mg/kg or <0.0000038%) **IGNORED Because: "<LOD"**  
 Phenanthrene: (Whole concentration entered as: 0.03 mg/kg or 0.00000285%)  
 Anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.0000038%) **IGNORED Because: "<LOD"**  
 Fluoranthene: (Whole concentration entered as: 0.09 mg/kg or 0.00000856%)  
 Pyrene: (Whole concentration entered as: 0.09 mg/kg or 0.00000856%)  
 Benzo[a]anthracene: (Whole concentration entered as: 0.13 mg/kg or 0.0000124%)  
 Chrysene: (Whole concentration entered as: 0.12 mg/kg or 0.0000114%)  
 Benzo[b]fluoranthene: (Whole concentration entered as: 0.18 mg/kg or 0.0000171%)  
 Benzo[k]fluoranthene: (Whole concentration entered as: 0.07 mg/kg or 0.00000665%)  
 Benzo[a]pyrene; benzo[def]chrysene: (Whole concentration entered as: 0.12 mg/kg or 0.0000114%)  
 Indeno[123-cd]pyrene: (Whole concentration entered as: 0.12 mg/kg or 0.0000114%)  
 Dibenz[a,h]anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.0000038%) **IGNORED Because: "<LOD"**  
 Benzo[ghi]perylene: (Whole concentration entered as: 0.11 mg/kg or 0.0000105%)  
 Oils: PAHs (8) as carcinogenic marker for oils: (Whole concentration entered as: 0.61 mg/kg or 0.000058%)  
 tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (Whole concentration entered as: <0.005 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Benzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Toluene: (Whole concentration entered as: <0.005 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Ethylbenzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Xylene: (Whole concentration entered as: <0.01 mg/kg or <0.00000951%) **IGNORED Because: "<LOD"**  
 Oils: GRO/PRO (C6-C10): (Whole concentration entered as: <0.1 mg/kg or <0.00000951%) **IGNORED Because: "<LOD"**  
 Oils: fuel oils (including DRO, C10-C25): (Whole concentration entered as: <7 mg/kg or <0.000665%) **IGNORED Because: "<LOD"**  
 Oils: non-fuel oils/lubricating oils (>C25): (Whole concentration entered as: <7 mg/kg or <0.000665%) **IGNORED Because: "<LOD"**

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

### Acenaphthylene (CAS Number: 208-96-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=59285&HarmOnly=no>

Data source date: 16/07/2012

Classification: R22, R26, R27, R36, R37, R38

### Acenaphthene (CAS Number: 83-32-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=133563&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, N; R51/53, R36, R37, R38

### Fluorene (CAS Number: 86-73-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=81845&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, R53

---

**Phenanthrene** (CAS Number: 85-01-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=109754&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R22, R36, R37, R38, R40, R43

---

**Anthracene** (CAS Number: 120-12-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=101102&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: N; R50/53, R36, R37, R38, R43

---

**Fluoranthene** (CAS Number: 206-44-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=56375&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R20, R22, R36

---

**Pyrene** (CAS Number: 129-00-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=87484&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R23

---

**Indeno[123-cd]pyrene** (CAS Number: 193-39-5)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=128806&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: R40

---

**Benzo[ghi]perylene** (CAS Number: 191-24-2)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=15793&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53

---

**Oils: PAHs (8) as carcinogenic marker for oils**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification:

---

**Oils: GRO/PRO (C6-C10)**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification: R65, R45, R49, R51/53

#### **Oils: fuel oils (including DRO, C10-C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R40, R51/53

#### **Oils: non-fuel oils/lubricating oils (>C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R45, R49, R53

### **Notes utilised in assessment**

#### **Additional Risk Phrase Comments**

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **C14.5.5: Step 5**

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration. Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Phenanthrene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Fluoranthene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Pyrene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[a]anthracene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Chrysene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[b]fluoranthene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[k]fluoranthene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[a]pyrene; benzo[def]chrysene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[ghi]perylene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

#### **C14.5.6: Step 6**

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Does the waste contain two or more substances that are classified as dangerous for the environment with aquatic risk phrases? The additive equations are only used where two or more ecotoxic substances are present."

Note used on:

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53"

#### **Note 1**

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note E (Table 3.2)

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

## Version

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008

1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26 September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30 March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

---

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08  
HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)  
HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP102**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**5.2%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.135%)

## Determinands (Dry Weight Moisture Content: 5.2%)

Arsenic trioxide: (Cation conc. entered: 40.6 mg/kg, converted to compound conc.:50.956 mg/kg or 0.0051%)

Cadmium sulphide: (Cation conc. entered: 5.7 mg/kg, converted to compound conc.:6.964 mg/kg or 0.000696%)

Chromium(III) oxide: (Cation conc. entered: 75.4 mg/kg, converted to compound conc.:104.754 mg/kg or 0.0105%)

Copper (I) oxide: (Cation conc. entered: 699 mg/kg, converted to compound conc.:748.095 mg/kg or 0.0748%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 940 mg/kg, converted to compound conc.:1349.24 mg/kg or 0.135%)

Mercury dichloride: (Cation conc. entered: 0.3 mg/kg, converted to compound conc.:0.386 mg/kg or 0.000386%)

Nickel dihydroxide: (Cation conc. entered: 111.8 mg/kg, converted to compound conc.:167.859 mg/kg or 0.0168%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.426 mg/kg or <0.000143%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 2085 mg/kg, converted to compound conc.:2466.947 mg/kg or 0.247%)



## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

## Notes utilised in assessment

### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

### C14.5.6: Step 6

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Does the waste contain two or more substances that are classified as dangerous for the environment with aquatic risk phrases? The additive equations are only used where two or more ecotoxic substances are present."

Note used on:

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53"

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note E (Table 3.2)

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

## Version

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008  
1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26 September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30 March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP103**

Site:

Project:

Sample Depth:

**3.5 m**

Dry Weight Moisture Content:

**5.2%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinands:

Lead compounds (with the exception of those listed separately in this Annex): (0.0538%)

PCBs/PCTs: (0.0000057%)

## Determinands (Dry Weight Moisture Content: 5.2%)

Arsenic trioxide: (Cation conc. entered: 14.8 mg/kg, converted to compound conc.:18.575 mg/kg or 0.00186%)

Cadmium sulphide: (Cation conc. entered: 3.1 mg/kg, converted to compound conc.:3.787 mg/kg or 0.000379%)

Chromium(III) oxide: (Cation conc. entered: 27.1 mg/kg, converted to compound conc.:37.65 mg/kg or 0.00377%)

Copper (I) oxide: (Cation conc. entered: 1038 mg/kg, converted to compound conc.:1110.905 mg/kg or 0.111%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 375 mg/kg, converted to compound conc.:538.26 mg/kg or 0.0538%)

Mercury dichloride: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.257 mg/kg or 0.0000257%)

Nickel dihydroxide: (Cation conc. entered: 46.3 mg/kg, converted to compound conc.:69.516 mg/kg or 0.00695%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.426 mg/kg or <0.000143%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 957 mg/kg, converted to compound conc.:1132.311 mg/kg or 0.113%)

Naphthalene: (Whole concentration entered as: <0.04 mg/kg or <0.0000038%) **IGNORED Because: "<LOD"**

Acenaphthylene: (Whole concentration entered as: <0.03 mg/kg or <0.00000285%) **IGNORED Because: "<LOD"**  
 Acenaphthene: (Whole concentration entered as: <0.05 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Fluorene: (Whole concentration entered as: <0.04 mg/kg or <0.0000038%) **IGNORED Because: "<LOD"**  
 Phenanthrene: (Whole concentration entered as: 0.07 mg/kg or 0.00000665%)  
 Anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.0000038%) **IGNORED Because: "<LOD"**  
 Fluoranthene: (Whole concentration entered as: 0.32 mg/kg or 0.0000304%)  
 Pyrene: (Whole concentration entered as: 0.28 mg/kg or 0.0000266%)  
 Benzo[a]anthracene: (Whole concentration entered as: 0.35 mg/kg or 0.0000333%)  
 Chrysene: (Whole concentration entered as: 0.31 mg/kg or 0.0000295%)  
 Benzo[b]fluoranthene: (Whole concentration entered as: 0.48 mg/kg or 0.0000456%)  
 Benzo[k]fluoranthene: (Whole concentration entered as: 0.18 mg/kg or 0.0000171%)  
 Benzo[a]pyrene; benzo[def]chrysene: (Whole concentration entered as: 0.42 mg/kg or 0.0000399%)  
 Indeno[123-cd]pyrene: (Whole concentration entered as: 0.29 mg/kg or 0.0000276%)  
 Dibenzo[a,h]anthracene: (Whole concentration entered as: 0.07 mg/kg or 0.00000665%)  
 Benzo[ghi]perylene: (Whole concentration entered as: 0.26 mg/kg or 0.0000247%)  
 Oils: PAHs (8) as carcinogenic marker for oils: (Whole concentration entered as: 1.75 mg/kg or 0.000166%)  
 tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (Whole concentration entered as: <0.005 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Benzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Toluene: (Whole concentration entered as: <0.005 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Ethylbenzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000475%) **IGNORED Because: "<LOD"**  
 Xylene: (Whole concentration entered as: <0.01 mg/kg or <0.00000951%) **IGNORED Because: "<LOD"**  
 Oils: GRO/PRO (C6-C10): (Whole concentration entered as: <0.1 mg/kg or <0.00000951%) **IGNORED Because: "<LOD"**  
 Oils: fuel oils (including DRO, C10-C25): (Whole concentration entered as: 187 mg/kg or 0.0178%)  
 Oils: non-fuel oils/lubricating oils (>C25): (Whole concentration entered as: 187 mg/kg or 0.0178%)  
 PCBs/PCTs: (Whole concentration entered as: 0.06 mg/kg or 0.0000057%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

### Acenaphthylene (CAS Number: 208-96-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=59285&HarmOnly=no>

Data source date: 16/07/2012

Classification: R22, R26, R27, R36, R37, R38

### Acenaphthene (CAS Number: 83-32-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=133563&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, N; R51/53, R36, R37, R38

### Fluorene (CAS Number: 86-73-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=81845&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, R53

---

**Phenanthrene** (CAS Number: 85-01-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=109754&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R22, R36, R37, R38, R40, R43

**Anthracene** (CAS Number: 120-12-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=101102&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: N; R50/53, R36, R37, R38, R43

**Fluoranthene** (CAS Number: 206-44-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=56375&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R20, R22, R36

**Pyrene** (CAS Number: 129-00-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=87484&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R23

**Indeno[123-cd]pyrene** (CAS Number: 193-39-5)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=128806&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: R40

**Benzo[ghi]perylene** (CAS Number: 191-24-2)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=15793&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53

**Oils: PAHs (8) as carcinogenic marker for oils**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification:

**Oils: GRO/PRO (C6-C10)**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification: R65, R45, R49, R51/53

#### **Oils: fuel oils (including DRO, C10-C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R40, R51/53

#### **Oils: non-fuel oils/lubricating oils (>C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R45, R49, R53

#### **Notes utilised in assessment**

##### **Additional Risk Phrase Comments**

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "Additional on R33" for determinand: "PCBs/PCTs"

##### **C14.5.5: Step 5**

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Phenanthrene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Fluoranthene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Pyrene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[a]anthracene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Chrysene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[b]fluoranthene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[k]fluoranthene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[a]pyrene; benzo[def]chrysene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Dibenz[a,h]anthracene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Benzo[ghi]perylene"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "PCBs/PCTs"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Oils: fuel oils (including DRO, C10-C25)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Oils: non-fuel oils/lubricating oils (>C25)"

##### **Note 1**

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."



Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note C

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers."

Note used on:

determinand: "PCBs/PCTs"

### Note E (Table 3.2)

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"



---

## Version

---

**Classification utilises the following:**

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008  
1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26 September 2009; binding date 1 Dec 2010  
2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30 March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures  
3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP104**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**0%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.213%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 10.6 mg/kg, converted to compound conc.:13.995 mg/kg or 0.0014%)

Cadmium sulphide: (Cation conc. entered: 0.7 mg/kg, converted to compound conc.:0.9 mg/kg or 0.00009%)

Chromium(III) oxide: (Cation conc. entered: 29 mg/kg, converted to compound conc.:42.385 mg/kg or 0.00424%)

Copper (I) oxide: (Cation conc. entered: 126 mg/kg, converted to compound conc.:141.862 mg/kg or 0.0142%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 1408 mg/kg, converted to compound conc.:2126.08 mg/kg or 0.213%)

Mercury dichloride: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.271 mg/kg or 0.0000271%)

Nickel dihydroxide: (Cation conc. entered: 23.5 mg/kg, converted to compound conc.:37.118 mg/kg or 0.00371%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 767 mg/kg, converted to compound conc.:954.696 mg/kg or 0.0955%)

Naphthalene: (Whole concentration entered as: <0.04 mg/kg or <0.000004%) **IGNORED Because: "<LOD"**

Acenaphthylene: (Whole concentration entered as: <0.03 mg/kg or <0.000003%) **IGNORED Because: "<LOD"**

Acenaphthene: (Whole concentration entered as: <0.05 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Fluorene: (Whole concentration entered as: <0.04 mg/kg or <0.000004%) **IGNORED Because: "<LOD"**  
 Phenanthrene: (Whole concentration entered as: 0.07 mg/kg or 0.000007%)  
 Anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.000004%) **IGNORED Because: "<LOD"**  
 Fluoranthene: (Whole concentration entered as: 0.15 mg/kg or 0.000015%)  
 Pyrene: (Whole concentration entered as: 0.14 mg/kg or 0.000014%)  
 Benzo[a]anthracene: (Whole concentration entered as: 0.14 mg/kg or 0.000014%)  
 Chrysene: (Whole concentration entered as: 0.14 mg/kg or 0.000014%)  
 Benzo[b]fluoranthene: (Whole concentration entered as: 0.19 mg/kg or 0.000019%)  
 Benzo[k]fluoranthene: (Whole concentration entered as: 0.08 mg/kg or 0.000008%)  
 Benzo[a]pyrene; benzo[def]chrysene: (Whole concentration entered as: 0.14 mg/kg or 0.000014%)  
 Indeno[123-cd]pyrene: (Whole concentration entered as: 0.1 mg/kg or 0.00001%)  
 Dibenz[a,h]anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.000004%) **IGNORED Because: "<LOD"**  
 Benzo[ghi]perylene: (Whole concentration entered as: 0.11 mg/kg or 0.000011%)  
 Oils: PAHs (8) as carcinogenic marker for oils: (Whole concentration entered as: 0.65 mg/kg or 0.000065%)  
 tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (Whole concentration entered as: <0.005 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Benzene: (Whole concentration entered as: <0.005 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Toluene: (Whole concentration entered as: <0.005 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Ethylbenzene: (Whole concentration entered as: <0.005 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Xylene: (Whole concentration entered as: <0.01 mg/kg or <0.000001%) **IGNORED Because: "<LOD"**  
 Oils: GRO/PRO (C6-C10): (Whole concentration entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**  
 Oils: fuel oils (including DRO, C10-C25): (Whole concentration entered as: 114 mg/kg or 0.0114%)  
 Oils: non-fuel oils/lubricating oils (>C25): (Whole concentration entered as: 114 mg/kg or 0.0114%)  
 Cyanides (with the exception of complex cyanides): (Whole concentration entered as: <0.5 mg/kg or <0.00005%)  
**IGNORED Because: "<LOD"**

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

### Acenaphthylene (CAS Number: 208-96-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=59285&HarmOnly=no>

Data source date: 16/07/2012

Classification: R22, R26, R27, R36, R37, R38

### Acenaphthene (CAS Number: 83-32-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=133563&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, N; R51/53, R36, R37, R38

### Fluorene (CAS Number: 86-73-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=81845&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, R53

---

**Phenanthrene** (CAS Number: 85-01-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=109754&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R22, R36, R37, R38, R40, R43

---

**Anthracene** (CAS Number: 120-12-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=101102&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: N; R50/53, R36, R37, R38, R43

---

**Fluoranthene** (CAS Number: 206-44-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=56375&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R20, R22, R36

---

**Pyrene** (CAS Number: 129-00-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=87484&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R23

---

**Indeno[123-cd]pyrene** (CAS Number: 193-39-5)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=128806&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: R40

---

**Benzo[ghi]perylene** (CAS Number: 191-24-2)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=15793&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53

---

**Oils: PAHs (8) as carcinogenic marker for oils**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification:

---

**Oils: GRO/PRO (C6-C10)**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification: R65, R45, R49, R51/53

#### Oils: fuel oils (including DRO, C10-C25)

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R40, R51/53

#### Oils: non-fuel oils/lubricating oils (>C25)

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R45, R49, R53

#### Notes utilised in assessment

##### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

##### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration. Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Oils: non-fuel oils/lubricating oils (>C25)"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Phenanthrene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Fluoranthene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Pyrene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]anthracene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chrysene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[b]fluoranthene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[k]fluoranthene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]pyrene; benzo[def]chrysene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[ghi]perylene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Oils: fuel oils (including DRO, C10-C25)"

##### C14.5.6: Step 6

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Does the waste contain two or more substances that are classified as dangerous for the environment with aquatic risk phrases? The additive equations are only used where two or more ecotoxic substances are present."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53"

##### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note E (Table 3.2)

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

## Version

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008  
1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26 September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30 March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

---

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08  
HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)  
HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)



## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP105**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**0%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinands:

Lead compounds (with the exception of those listed separately in this Annex): (0.0222%)

PCBs/PCTs: (0.000006%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 13.1 mg/kg, converted to compound conc.:17.296 mg/kg or 0.00173%)

Cadmium sulphide: (Cation conc. entered: 0.6 mg/kg, converted to compound conc.:0.771 mg/kg or 0.0000771%)

Chromium(III) oxide: (Cation conc. entered: 12.6 mg/kg, converted to compound conc.:18.416 mg/kg or 0.00184%)

Copper (I) oxide: (Cation conc. entered: 72 mg/kg, converted to compound conc.:81.064 mg/kg or 0.00811%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 147 mg/kg, converted to compound conc.:221.97 mg/kg or 0.0222%)

Mercury dichloride: (Cation conc. entered: <0.1 mg/kg, converted to compound conc.:<0.135 mg/kg or <0.0000135%)

**IGNORED Because: "<LOD"**

Nickel dihydroxide: (Cation conc. entered: 13 mg/kg, converted to compound conc.:20.533 mg/kg or 0.00205%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 193 mg/kg, converted to compound conc.:240.23 mg/kg or 0.024%)

Cyanides (with the exception of complex cyanides): (Whole concentration entered as: <0.5 mg/kg or <0.00005%)

**IGNORED Because: "<LOD"**

PCBs/PCTs: (Whole concentration entered as: 0.06 mg/kg or 0.000006%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

## Notes utilised in assessment

### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "Additional on R33" for determinand: "PCBs/PCTs"

### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "PCBs/PCTs"

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note A**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note C**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers."

Note used on:

determinand: "PCBs/PCTs"

#### **Note E (Table 3.2)**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

#### **Version**

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008  
1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26

September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30

March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP106**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**24.4%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinands:

Lead compounds (with the exception of those listed separately in this Annex): (0.0461%)

PCBs/PCTs: (0.00000482%)

## Determinands (Dry Weight Moisture Content: 24.4%)

Arsenic trioxide: (Cation conc. entered: 13.6 mg/kg, converted to compound conc.:14.434 mg/kg or 0.00144%)

Cadmium sulphide: (Cation conc. entered: 1.8 mg/kg, converted to compound conc.:1.86 mg/kg or 0.000186%)

Chromium(III) oxide: (Cation conc. entered: 33.3 mg/kg, converted to compound conc.:39.124 mg/kg or 0.00391%)

Copper (I) oxide: (Cation conc. entered: 216 mg/kg, converted to compound conc.:195.492 mg/kg or 0.0195%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 380 mg/kg, converted to compound conc.:461.254 mg/kg or 0.0461%)

Mercury dichloride: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.218 mg/kg or 0.0000218%)

Nickel dihydroxide: (Cation conc. entered: 22.4 mg/kg, converted to compound conc.:28.441 mg/kg or 0.00284%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.206 mg/kg or <0.000121%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 669 mg/kg, converted to compound conc.:669.384 mg/kg or 0.0669%)

Naphthalene: (Whole concentration entered as: <0.04 mg/kg or <0.00000322%) **IGNORED Because: "<LOD"**

Acenaphthylene: (Whole concentration entered as: <0.03 mg/kg or <0.00000241%) **IGNORED Because: "<LOD"**

Acenaphthene: (Whole concentration entered as: <0.05 mg/kg or <0.00000402%) **IGNORED Because: "<LOD"**

Fluorene: (Whole concentration entered as: <0.04 mg/kg or <0.00000322%) **IGNORED Because: "<LOD"**

Phenanthrene: (Whole concentration entered as: 0.1 mg/kg or 0.00000804%)

Anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.00000322%) **IGNORED Because: "<LOD"**

Fluoranthene: (Whole concentration entered as: 0.22 mg/kg or 0.0000177%)

Pyrene: (Whole concentration entered as: 0.18 mg/kg or 0.0000145%)

Benzo[a]anthracene: (Whole concentration entered as: 0.21 mg/kg or 0.0000169%)

Chrysene: (Whole concentration entered as: 0.17 mg/kg or 0.0000137%)

Benzo[b]fluoranthene: (Whole concentration entered as: 0.23 mg/kg or 0.0000185%)

Benzo[k]fluoranthene: (Whole concentration entered as: 0.09 mg/kg or 0.00000723%)

Benzo[a]pyrene; benzo[def]chrysene: (Whole concentration entered as: 0.17 mg/kg or 0.0000137%)

Indeno[123-cd]pyrene: (Whole concentration entered as: 0.14 mg/kg or 0.0000113%)

Dibenz[a,h]anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.00000322%) **IGNORED Because: "<LOD"**

Benzo[ghi]perylene: (Whole concentration entered as: 0.13 mg/kg or 0.0000105%)

Oils: PAHs (8) as carcinogenic marker for oils: (Whole concentration entered as: 0.8 mg/kg or 0.0000643%)

tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (Whole concentration entered as: <0.005 mg/kg or <0.000000402%) **IGNORED Because: "<LOD"**

Benzene: (Whole concentration entered as: <0.005 mg/kg or <0.000000402%) **IGNORED Because: "<LOD"**

Toluene: (Whole concentration entered as: <0.005 mg/kg or <0.000000402%) **IGNORED Because: "<LOD"**

Ethylbenzene: (Whole concentration entered as: <0.005 mg/kg or <0.000000402%) **IGNORED Because: "<LOD"**

Xylene: (Whole concentration entered as: <0.01 mg/kg or <0.000000804%) **IGNORED Because: "<LOD"**

Oils: GRO/PRO (C6-C10): (Whole concentration entered as: <0.1 mg/kg or <0.00000804%) **IGNORED Because: "<LOD"**

Oils: fuel oils (including DRO, C10-C25): (Whole concentration entered as: <7 mg/kg or <0.000563%) **IGNORED Because: "<LOD"**

Oils: non-fuel oils/lubricating oils (>C25): (Whole concentration entered as: <7 mg/kg or <0.000563%) **IGNORED Because: "<LOD"**

PCBs/PCTs: (Whole concentration entered as: 0.06 mg/kg or 0.00000482%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

### Acenaphthylene (CAS Number: 208-96-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=59285&HarmOnly=no>

Data source date: 16/07/2012

Classification: R22, R26, R27, R36, R37, R38

### Acenaphthene (CAS Number: 83-32-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=133563&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, N; R51/53, R36, R37, R38

---

**Fluorene** (CAS Number: 86-73-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=81845&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R53

---

**Phenanthrene** (CAS Number: 85-01-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=109754&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R22, R36, R37, R38, R40, R43

---

**Anthracene** (CAS Number: 120-12-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=101102&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: N; R50/53, R36, R37, R38, R43

---

**Fluoranthene** (CAS Number: 206-44-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=56375&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R20, R22, R36

---

**Pyrene** (CAS Number: 129-00-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=87484&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R23

---

**Indeno[123-cd]pyrene** (CAS Number: 193-39-5)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=128806&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: R40

---

**Benzo[ghi]perylene** (CAS Number: 191-24-2)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=15793&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53

---

**Oils: PAHs (8) as carcinogenic marker for oils**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification:



#### **Oils: GRO/PRO (C6-C10)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R45, R49, R51/53

#### **Oils: fuel oils (including DRO, C10-C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R40, R51/53

#### **Oils: non-fuel oils/lubricating oils (>C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R45, R49, R53

### **Notes utilised in assessment**

#### **Additional Risk Phrase Comments**

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "Additional on R33" for determinand: "PCBs/PCTs"

#### **C14.5.5: Step 5**

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration. Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Phenanthrene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Fluoranthene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Pyrene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]anthracene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chrysene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[b]fluoranthene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[k]fluoranthene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]pyrene; benzo[def]chrysene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[ghi]perylene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "PCBs/PCTs"



**Note 1**

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

**Substance notes**

**Note 1**

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

**Note A**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

**Note C**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers."

Note used on:

determinand: "PCBs/PCTs"

**Note E (Table 3.2)**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

---

## Version

### Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008  
1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26 September 2009; binding date 1 Dec 2010  
2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30 March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures  
3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP107**

Site:

Project:

Sample Depth:

**1 m**

Dry Weight Moisture Content:

**0%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.0183%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 14.3 mg/kg, converted to compound conc.:18.881 mg/kg or 0.00189%)

Cadmium sulphide: (Cation conc. entered: 0.6 mg/kg, converted to compound conc.:0.771 mg/kg or 0.0000771%)

Chromium(III) oxide: (Cation conc. entered: 8.9 mg/kg, converted to compound conc.:13.008 mg/kg or 0.0013%)

Copper (I) oxide: (Cation conc. entered: 45 mg/kg, converted to compound conc.:50.665 mg/kg or 0.00507%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 121 mg/kg, converted to compound conc.:182.71 mg/kg or 0.0183%)

Mercury dichloride: (Cation conc. entered: <0.1 mg/kg, converted to compound conc.:<0.135 mg/kg or <0.0000135%)

**IGNORED Because: "<LOD"**

Nickel dihydroxide: (Cation conc. entered: 7.4 mg/kg, converted to compound conc.:11.688 mg/kg or 0.00117%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**

diboron trioxide; boric oxide: (Whole concentration entered as: 3.1 mg/kg or 0.00031%)

Zinc oxide: (Cation conc. entered: 193 mg/kg, converted to compound conc.:240.23 mg/kg or 0.024%)

beryllium compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex: (Whole concentration entered as: 0.6 mg/kg or 0.00006%)

barium salts, with the exception of barium sulphate, salts of 1-azo-2-hydroxynaphthalenyl aryl sulphonic acid, and of salts specified elsewhere in this Annex: (Whole concentration entered as: 79 mg/kg or 0.0079%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

## Notes utilised in assessment

### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "beryllium compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex"

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "barium salts, with the exception of barium sulphate, salts of 1-azo-2-hydroxynaphthalenyl aryl sulphonic acid, and of salts specified elsewhere in this Annex"

### Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "beryllium compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex"

determinand: "barium salts, with the exception of barium sulphate, salts of 1-azo-2-hydroxynaphthalenyl aryl sulphonic acid, and of salts specified elsewhere in this Annex"

### Note E (Table 3.2)

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

determinand: "beryllium compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex"

## Version

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008

1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26

September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30

March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP108**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**0%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.0193%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 13.6 mg/kg, converted to compound conc.:17.956 mg/kg or 0.0018%)

Cadmium sulphide: (Cation conc. entered: 0.5 mg/kg, converted to compound conc.:0.643 mg/kg or 0.0000643%)

Chromium(III) oxide: (Cation conc. entered: 15.5 mg/kg, converted to compound conc.:22.654 mg/kg or 0.00227%)

Copper (I) oxide: (Cation conc. entered: 70 mg/kg, converted to compound conc.:78.812 mg/kg or 0.00788%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 128 mg/kg, converted to compound conc.:193.28 mg/kg or 0.0193%)

Mercury dichloride: (Cation conc. entered: 0.3 mg/kg, converted to compound conc.:0.406 mg/kg or 0.0000406%)

Nickel dihydroxide: (Cation conc. entered: 13.5 mg/kg, converted to compound conc.:21.323 mg/kg or 0.00213%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 343 mg/kg, converted to compound conc.:426.937 mg/kg or 0.0427%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

## Notes utilised in assessment

### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."



Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note A**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note E (Table 3.2)**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

#### **Version**

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008

1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26

September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30

March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July

2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP109**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**20%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinands:

Lead compounds (with the exception of those listed separately in this Annex): (0.0717%)

PCBs/PCTs: (0.000005%)

## Determinands (Dry Weight Moisture Content: 20%)

Arsenic trioxide: (Cation conc. entered: 12.8 mg/kg, converted to compound conc.:14.083 mg/kg or 0.00141%)

Cadmium sulphide: (Cation conc. entered: 2.1 mg/kg, converted to compound conc.:2.249 mg/kg or 0.000225%)

Chromium(III) oxide: (Cation conc. entered: 91 mg/kg, converted to compound conc.:110.835 mg/kg or 0.0111%)

Copper (I) oxide: (Cation conc. entered: 435 mg/kg, converted to compound conc.:408.135 mg/kg or 0.0408%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 570 mg/kg, converted to compound conc.:717.25 mg/kg or 0.0717%)

Mercury dichloride: (Cation conc. entered: 0.3 mg/kg, converted to compound conc.:0.338 mg/kg or 0.0000338%)

Nickel dihydroxide: (Cation conc. entered: 67.7 mg/kg, converted to compound conc.:89.11 mg/kg or 0.00891%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.25 mg/kg or <0.000125%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 900 mg/kg, converted to compound conc.:933.535 mg/kg or 0.0934%)

Naphthalene: (Whole concentration entered as: 0.06 mg/kg or 0.000005%)

Acenaphthylene: (Whole concentration entered as: 0.07 mg/kg or 0.00000583%)  
 Acenaphthene: (Whole concentration entered as: <0.05 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Fluorene: (Whole concentration entered as: 0.05 mg/kg or 0.00000417%)  
 Phenanthrene: (Whole concentration entered as: 0.6 mg/kg or 0.00005%)  
 Anthracene: (Whole concentration entered as: 0.13 mg/kg or 0.0000108%)  
 Fluoranthene: (Whole concentration entered as: 1.1 mg/kg or 0.0000917%)  
 Pyrene: (Whole concentration entered as: 0.9 mg/kg or 0.000075%)  
 Benzo[a]anthracene: (Whole concentration entered as: 0.69 mg/kg or 0.0000575%)  
 Chrysene: (Whole concentration entered as: 0.6 mg/kg or 0.00005%)  
 Benzo[b]fluoranthene: (Whole concentration entered as: 0.73 mg/kg or 0.0000608%)  
 Benzo[k]fluoranthene: (Whole concentration entered as: 0.29 mg/kg or 0.0000242%)  
 Benzo[a]pyrene; benzo[def]chrysene: (Whole concentration entered as: 0.6 mg/kg or 0.00005%)  
 Indeno[123-cd]pyrene: (Whole concentration entered as: 0.37 mg/kg or 0.0000308%)  
 Dibenz[a,h]anthracene: (Whole concentration entered as: 0.1 mg/kg or 0.00000833%)  
 Benzo[ghi]perylene: (Whole concentration entered as: 0.34 mg/kg or 0.0000283%)  
 Oils: PAHs (8) as carcinogenic marker for oils: (Whole concentration entered as: 2.69 mg/kg or 0.000224%)  
 tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (Whole concentration entered as: <0.005 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Benzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Toluene: (Whole concentration entered as: <0.005 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Ethylbenzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Xylene: (Whole concentration entered as: <0.01 mg/kg or <0.00000833%) **IGNORED Because: "<LOD"**  
 Oils: GRO/PRO (C6-C10): (Whole concentration entered as: <0.1 mg/kg or <0.00000833%) **IGNORED Because: "<LOD"**  
 Oils: fuel oils (including DRO, C10-C25): (Whole concentration entered as: 21 mg/kg or 0.00175%)  
 Oils: non-fuel oils/lubricating oils (>C25): (Whole concentration entered as: <7 mg/kg or <0.000583%) **IGNORED Because: "<LOD"**  
 PCBs/PCTs: (Whole concentration entered as: 0.06 mg/kg or 0.000005%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

### Acenaphthylene (CAS Number: 208-96-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=59285&HarmOnly=no>

Data source date: 16/07/2012

Classification: R22, R26, R27, R36, R37, R38

### Acenaphthene (CAS Number: 83-32-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=133563&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, N; R51/53, R36, R37, R38

### Fluorene (CAS Number: 86-73-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=81845&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, R53

---

**Phenanthrene** (CAS Number: 85-01-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=109754&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R22, R36, R37, R38, R40, R43

---

**Anthracene** (CAS Number: 120-12-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=101102&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: N; R50/53, R36, R37, R38, R43

---

**Fluoranthene** (CAS Number: 206-44-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=56375&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R20, R22, R36

---

**Pyrene** (CAS Number: 129-00-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=87484&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R23

---

**Indeno[123-cd]pyrene** (CAS Number: 193-39-5)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=128806&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: R40

---

**Benzo[ghi]perylene** (CAS Number: 191-24-2)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=15793&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53

---

**Oils: PAHs (8) as carcinogenic marker for oils**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification:

---

**Oils: GRO/PRO (C6-C10)**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification: R65, R45, R49, R51/53

### Oils: fuel oils (including DRO, C10-C25)

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R40, R51/53

### Oils: non-fuel oils/lubricating oils (>C25)

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R45, R49, R53

### Notes utilised in assessment

#### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "Additional on R33" for determinand: "PCBs/PCTs"

#### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Fluorene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Naphthalene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Phenanthrene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Anthracene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Fluoranthene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Pyrene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]anthracene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chrysene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[b]fluoranthene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[k]fluoranthene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]pyrene; benzo[def]chrysene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Dibenz[a,h]anthracene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[ghi]perylene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "PCBs/PCTs"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Oils: fuel oils (including DRO, C10-C25)"

#### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note C

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers."

Note used on:

determinand: "PCBs/PCTs"

### Note E (Table 3.2)

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

---

## Version

---

**Classification utilises the following:**

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008  
1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26 September 2009; binding date 1 Dec 2010  
2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30 March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures  
3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)



## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP110**

Site:

Project:

Sample Depth:

**2 m**

Dry Weight Moisture Content:

**20%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.0736%)

## Determinands (Dry Weight Moisture Content: 20%)

Arsenic trioxide: (Cation conc. entered: 15.2 mg/kg, converted to compound conc.:16.724 mg/kg or 0.00167%)

Cadmium sulphide: (Cation conc. entered: 3.2 mg/kg, converted to compound conc.:3.427 mg/kg or 0.000343%)

Chromium(III) oxide: (Cation conc. entered: 55.9 mg/kg, converted to compound conc.:68.084 mg/kg or 0.00681%)

Copper (I) oxide: (Cation conc. entered: 807 mg/kg, converted to compound conc.:757.16 mg/kg or 0.0757%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 585 mg/kg, converted to compound conc.:736.125 mg/kg or 0.0736%)

Mercury dichloride: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.226 mg/kg or 0.0000226%)

Nickel dihydroxide: (Cation conc. entered: 59.1 mg/kg, converted to compound conc.:77.79 mg/kg or 0.00778%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.25 mg/kg or <0.000125%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 2116 mg/kg, converted to compound conc.:2194.846 mg/kg or 0.219%)

Naphthalene: (Whole concentration entered as: <0.04 mg/kg or <0.00000333%) **IGNORED Because: "<LOD"**

Acenaphthylene: (Whole concentration entered as: <0.03 mg/kg or <0.0000025%) **IGNORED Because: "<LOD"**

Acenaphthene: (Whole concentration entered as: <0.05 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Fluorene: (Whole concentration entered as: <0.04 mg/kg or <0.00000333%) **IGNORED Because: "<LOD"**  
 Phenanthrene: (Whole concentration entered as: 0.07 mg/kg or 0.00000583%)  
 Anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.00000333%) **IGNORED Because: "<LOD"**  
 Fluoranthene: (Whole concentration entered as: 0.11 mg/kg or 0.00000917%)  
 Pyrene: (Whole concentration entered as: 0.09 mg/kg or 0.0000075%)  
 Benzo[a]anthracene: (Whole concentration entered as: 0.09 mg/kg or 0.0000075%)  
 Chrysene: (Whole concentration entered as: 0.07 mg/kg or 0.00000583%)  
 Benzo[b]fluoranthene: (Whole concentration entered as: 0.1 mg/kg or 0.00000833%)  
 Benzo[k]fluoranthene: (Whole concentration entered as: 0.04 mg/kg or 0.00000333%)  
 Benzo[a]pyrene; benzo[def]chrysene: (Whole concentration entered as: 0.07 mg/kg or 0.00000583%)  
 Indeno[123-cd]pyrene: (Whole concentration entered as: 0.05 mg/kg or 0.00000417%)  
 Dibenz[a,h]anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.00000333%) **IGNORED Because: "<LOD"**  
 Benzo[ghi]perylene: (Whole concentration entered as: 0.06 mg/kg or 0.000005%)  
 Oils: PAHs (8) as carcinogenic marker for oils: (Whole concentration entered as: 0.33 mg/kg or 0.0000275%)  
 tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (Whole concentration entered as: <0.005 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Benzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Toluene: (Whole concentration entered as: <0.005 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Ethylbenzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000417%) **IGNORED Because: "<LOD"**  
 Xylene: (Whole concentration entered as: <0.01 mg/kg or <0.00000833%) **IGNORED Because: "<LOD"**  
 Oils: GRO/PRO (C6-C10): (Whole concentration entered as: <0.1 mg/kg or <0.00000833%) **IGNORED Because: "<LOD"**  
 Oils: fuel oils (including DRO, C10-C25): (Whole concentration entered as: <7 mg/kg or <0.000583%) **IGNORED Because: "<LOD"**  
 Oils: non-fuel oils/lubricating oils (>C25): (Whole concentration entered as: <7 mg/kg or <0.000583%) **IGNORED Because: "<LOD"**

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

### Acenaphthylene (CAS Number: 208-96-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=59285&HarmOnly=no>

Data source date: 16/07/2012

Classification: R22, R26, R27, R36, R37, R38

### Acenaphthene (CAS Number: 83-32-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=133563&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, N; R51/53, R36, R37, R38

### Fluorene (CAS Number: 86-73-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=81845&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, R53

---

**Phenanthrene** (CAS Number: 85-01-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=109754&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R22, R36, R37, R38, R40, R43

---

**Anthracene** (CAS Number: 120-12-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=101102&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: N; R50/53, R36, R37, R38, R43

---

**Fluoranthene** (CAS Number: 206-44-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=56375&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R20, R22, R36

---

**Pyrene** (CAS Number: 129-00-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=87484&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R23

---

**Indeno[123-cd]pyrene** (CAS Number: 193-39-5)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=128806&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: R40

---

**Benzo[ghi]perylene** (CAS Number: 191-24-2)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=15793&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53

---

**Oils: PAHs (8) as carcinogenic marker for oils**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification:

---

**Oils: GRO/PRO (C6-C10)**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification: R65, R45, R49, R51/53

#### **Oils: fuel oils (including DRO, C10-C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R40, R51/53

#### **Oils: non-fuel oils/lubricating oils (>C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R45, R49, R53

### **Notes utilised in assessment**

#### **Additional Risk Phrase Comments**

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **C14.5.5: Step 5**

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration. Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Phenanthrene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Fluoranthene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Pyrene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]anthracene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chrysene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[b]fluoranthene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[k]fluoranthene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]pyrene; benzo[def]chrysene"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[ghi]perylene"

#### **C14.5.6: Step 6**

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Does the waste contain two or more substances that are classified as dangerous for the environment with aquatic risk phrases? The additive equations are only used where two or more ecotoxic substances are present."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53"

#### **Note 1**

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note E (Table 3.2)

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

## Version

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008

1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26 September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30 March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

---

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08  
HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)  
HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP111**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**0%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.0116%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 9.9 mg/kg, converted to compound conc.:13.071 mg/kg or 0.00131%)

Cadmium sulphide: (Cation conc. entered: 0.3 mg/kg, converted to compound conc.:0.386 mg/kg or 0.0000386%)

Chromium(III) oxide: (Cation conc. entered: 9 mg/kg, converted to compound conc.:13.154 mg/kg or 0.00132%)

Copper (I) oxide: (Cation conc. entered: 36 mg/kg, converted to compound conc.:40.532 mg/kg or 0.00405%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 77 mg/kg, converted to compound conc.:116.27 mg/kg or 0.0116%)

Mercury dichloride: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.271 mg/kg or 0.0000271%)

Nickel dihydroxide: (Cation conc. entered: 7.4 mg/kg, converted to compound conc.:11.688 mg/kg or 0.00117%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 250 mg/kg, converted to compound conc.:311.178 mg/kg or 0.0311%)



## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

## Notes utilised in assessment

### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note A**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note E (Table 3.2)**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

#### **Version**

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008

1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26

September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30

March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July

2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP112**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**17.9%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.0246%)

## Determinands (Dry Weight Moisture Content: 17.9%)

Arsenic trioxide: (Cation conc. entered: 15.5 mg/kg, converted to compound conc.:17.358 mg/kg or 0.00174%)

Cadmium sulphide: (Cation conc. entered: 0.3 mg/kg, converted to compound conc.:0.327 mg/kg or 0.0000327%)

Chromium(III) oxide: (Cation conc. entered: 11.1 mg/kg, converted to compound conc.:13.76 mg/kg or 0.00138%)

Copper (I) oxide: (Cation conc. entered: 34 mg/kg, converted to compound conc.:32.468 mg/kg or 0.00325%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 192 mg/kg, converted to compound conc.:245.903 mg/kg or 0.0246%)

Mercury dichloride: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.23 mg/kg or 0.000023%)

Nickel dihydroxide: (Cation conc. entered: 8.5 mg/kg, converted to compound conc.:11.387 mg/kg or 0.00114%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.272 mg/kg or <0.000127%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 232 mg/kg, converted to compound conc.:244.931 mg/kg or 0.0245%)

Naphthalene: (Whole concentration entered as: <0.04 mg/kg or <0.00000339%) **IGNORED Because: "<LOD"**

Acenaphthylene: (Whole concentration entered as: 0.05 mg/kg or 0.00000424%)

Acenaphthene: (Whole concentration entered as: <0.05 mg/kg or <0.00000424%) **IGNORED Because: "<LOD"**  
 Fluorene: (Whole concentration entered as: 0.05 mg/kg or 0.00000424%)  
 Phenanthrene: (Whole concentration entered as: 0.58 mg/kg or 0.0000492%)  
 Anthracene: (Whole concentration entered as: 0.15 mg/kg or 0.0000127%)  
 Fluoranthene: (Whole concentration entered as: 0.94 mg/kg or 0.0000797%)  
 Pyrene: (Whole concentration entered as: 0.75 mg/kg or 0.0000636%)  
 Benzo[a]anthracene: (Whole concentration entered as: 0.56 mg/kg or 0.0000475%)  
 Chrysene: (Whole concentration entered as: 0.45 mg/kg or 0.0000382%)  
 Benzo[b]fluoranthene: (Whole concentration entered as: 0.53 mg/kg or 0.000045%)  
 Benzo[k]fluoranthene: (Whole concentration entered as: 0.2 mg/kg or 0.000017%)  
 Benzo[a]pyrene; benzo[def]chrysene: (Whole concentration entered as: 0.43 mg/kg or 0.0000365%)  
 Indeno[123-cd]pyrene: (Whole concentration entered as: 0.27 mg/kg or 0.0000229%)  
 Dibenz[a,h]anthracene: (Whole concentration entered as: 0.07 mg/kg or 0.00000594%)  
 Benzo[ghi]perylene: (Whole concentration entered as: 0.25 mg/kg or 0.0000212%)  
 Oils: PAHs (8) as carcinogenic marker for oils: (Whole concentration entered as: 1.95 mg/kg or 0.000165%)  
 tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (Whole concentration entered as: <0.005 mg/kg or <0.00000424%) **IGNORED Because: "<LOD"**  
 Benzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000424%) **IGNORED Because: "<LOD"**  
 Toluene: (Whole concentration entered as: <0.005 mg/kg or <0.00000424%) **IGNORED Because: "<LOD"**  
 Ethylbenzene: (Whole concentration entered as: <0.005 mg/kg or <0.00000424%) **IGNORED Because: "<LOD"**  
 Xylene: (Whole concentration entered as: <0.01 mg/kg or <0.00000848%) **IGNORED Because: "<LOD"**  
 Oils: GRO/PRO (C6-C10): (Whole concentration entered as: <0.1 mg/kg or <0.00000848%) **IGNORED Because: "<LOD"**  
 Oils: fuel oils (including DRO, C10-C25): (Whole concentration entered as: 188 mg/kg or 0.0159%)  
 Oils: non-fuel oils/lubricating oils (>C25): (Whole concentration entered as: 188 mg/kg or 0.0159%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

### Acenaphthylene (CAS Number: 208-96-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=59285&HarmOnly=no>

Data source date: 16/07/2012

Classification: R22, R26, R27, R36, R37, R38

### Acenaphthene (CAS Number: 83-32-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=133563&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, N; R51/53, R36, R37, R38

### Fluorene (CAS Number: 86-73-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=81845&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, R53

---

**Phenanthrene** (CAS Number: 85-01-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=109754&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R22, R36, R37, R38, R40, R43

---

**Anthracene** (CAS Number: 120-12-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=101102&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: N; R50/53, R36, R37, R38, R43

---

**Fluoranthene** (CAS Number: 206-44-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=56375&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R20, R22, R36

---

**Pyrene** (CAS Number: 129-00-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=87484&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R23

---

**Indeno[123-cd]pyrene** (CAS Number: 193-39-5)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=128806&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: R40

---

**Benzo[ghi]perylene** (CAS Number: 191-24-2)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=15793&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53

---

**Oils: PAHs (8) as carcinogenic marker for oils**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification:

---

**Oils: GRO/PRO (C6-C10)**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification: R65, R45, R49, R51/53

#### Oils: fuel oils (including DRO, C10-C25)

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R40, R51/53

#### Oils: non-fuel oils/lubricating oils (>C25)

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R45, R49, R53

#### Notes utilised in assessment

##### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

##### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration. Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Fluorene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Oils: non-fuel oils/lubricating oils (>C25)"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Phenanthrene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Anthracene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Fluoranthene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Pyrene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]anthracene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chrysene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[b]fluoranthene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[k]fluoranthene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]pyrene; benzo[def]chrysene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Dibenz[a,h]anthracene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[ghi]perylene"  
 Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Oils: fuel oils (including DRO, C10-C25)"

##### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."



Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note E (Table 3.2)

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

## Version

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008  
1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26 September 2009; binding date 1 Dec 2010  
2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30 March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures  
3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)



## Classification



### Non Hazardous Waste

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP113**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**0%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.0246%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 50.4 mg/kg, converted to compound conc.:66.544 mg/kg or 0.00665%)

Cadmium sulphide: (Cation conc. entered: 0.8 mg/kg, converted to compound conc.:1.028 mg/kg or 0.000103%)

Chromium(III) oxide: (Cation conc. entered: 71.6 mg/kg, converted to compound conc.:104.647 mg/kg or 0.0105%)

Copper (I) oxide: (Cation conc. entered: 59 mg/kg, converted to compound conc.:66.427 mg/kg or 0.00664%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 163 mg/kg, converted to compound conc.:246.13 mg/kg or 0.0246%)

Mercury dichloride: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.271 mg/kg or 0.0000271%)

Nickel dihydroxide: (Cation conc. entered: 52.7 mg/kg, converted to compound conc.:83.24 mg/kg or 0.00832%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 173 mg/kg, converted to compound conc.:215.336 mg/kg or 0.0215%)

Naphthalene: (Whole concentration entered as: <0.04 mg/kg or <0.000004%) **IGNORED Because: "<LOD"**

Acenaphthylene: (Whole concentration entered as: 0.03 mg/kg or 0.000003%)

Acenaphthene: (Whole concentration entered as: <0.05 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Fluorene: (Whole concentration entered as: <0.04 mg/kg or <0.000004%) **IGNORED Because: "<LOD"**  
 Phenanthrene: (Whole concentration entered as: 0.18 mg/kg or 0.000018%)  
 Anthracene: (Whole concentration entered as: 0.06 mg/kg or 0.000006%)  
 Fluoranthene: (Whole concentration entered as: 0.36 mg/kg or 0.000036%)  
 Pyrene: (Whole concentration entered as: 0.34 mg/kg or 0.000034%)  
 Benzo[a]anthracene: (Whole concentration entered as: 0.28 mg/kg or 0.000028%)  
 Chrysene: (Whole concentration entered as: 0.23 mg/kg or 0.000023%)  
 Benzo[b]fluoranthene: (Whole concentration entered as: 0.26 mg/kg or 0.000026%)  
 Benzo[k]fluoranthene: (Whole concentration entered as: 0.1 mg/kg or 0.00001%)  
 Benzo[a]pyrene; benzo[def]chrysene: (Whole concentration entered as: 0.18 mg/kg or 0.000018%)  
 Indeno[123-cd]pyrene: (Whole concentration entered as: 0.16 mg/kg or 0.000016%)  
 Dibenz[a,h]anthracene: (Whole concentration entered as: <0.04 mg/kg or <0.000004%) **IGNORED Because: "<LOD"**  
 Benzo[ghi]perylene: (Whole concentration entered as: 0.14 mg/kg or 0.000014%)  
 Oils: PAHs (8) as carcinogenic marker for oils: (Whole concentration entered as: 0.93 mg/kg or 0.000093%)  
 tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane: (Whole concentration entered as: <0.005 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Benzene: (Whole concentration entered as: <0.005 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Toluene: (Whole concentration entered as: <0.005 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Ethylbenzene: (Whole concentration entered as: <0.005 mg/kg or <0.000005%) **IGNORED Because: "<LOD"**  
 Xylene: (Whole concentration entered as: <0.01 mg/kg or <0.000001%) **IGNORED Because: "<LOD"**  
 Oils: GRO/PRO (C6-C10): (Whole concentration entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**  
 Oils: fuel oils (including DRO, C10-C25): (Whole concentration entered as: 539 mg/kg or 0.0539%)  
 Oils: non-fuel oils/lubricating oils (>C25): (Whole concentration entered as: 406 mg/kg or 0.0406%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

### Acenaphthylene (CAS Number: 208-96-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=59285&HarmOnly=no>

Data source date: 16/07/2012

Classification: R22, R26, R27, R36, R37, R38

### Acenaphthene (CAS Number: 83-32-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=133563&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, N; R51/53, R36, R37, R38

### Fluorene (CAS Number: 86-73-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=81845&HarmOnly=no>

Data source date: 16/07/2012

Classification: N; R50/53, R53

---

**Phenanthrene** (CAS Number: 85-01-8)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=109754&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R22, R36, R37, R38, R40, R43

---

**Anthracene** (CAS Number: 120-12-7)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=101102&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: N; R50/53, R36, R37, R38, R43

---

**Fluoranthene** (CAS Number: 206-44-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=56375&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R20, R22, R36

---

**Pyrene** (CAS Number: 129-00-0)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=87484&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53, R23

---

**Indeno[123-cd]pyrene** (CAS Number: 193-39-5)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=128806&HarmOnly=no>  
Data source date: 08/03/2013  
Classification: R40

---

**Benzo[ghi]perylene** (CAS Number: 191-24-2)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory  
Data source:  
<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=15793&HarmOnly=no>  
Data source date: 16/07/2012  
Classification: N; R50/53

---

**Oils: PAHs (8) as carcinogenic marker for oils**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification:

---

**Oils: GRO/PRO (C6-C10)**

Comments:  
Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency  
Data source date: 29/06/2007  
Classification: R65, R45, R49, R51/53

#### **Oils: fuel oils (including DRO, C10-C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R40, R51/53

#### **Oils: non-fuel oils/lubricating oils (>C25)**

Comments:

Data source: HWR08 Version 3.1, June 2007: How to find out if waste oil and wastes that contain oil are hazardous, Environment Agency

Data source date: 29/06/2007

Classification: R65, R45, R49, R53

#### **Notes utilised in assessment**

##### **Additional Risk Phrase Comments**

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

##### **C14.5.5: Step 5**

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration. Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Oils: non-fuel oils/lubricating oils (>C25)"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Phenanthrene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Anthracene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Fluoranthene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Pyrene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]anthracene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chrysene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[b]fluoranthene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[k]fluoranthene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[a]pyrene; benzo[def]chrysene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Benzo[ghi]perylene"  
Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Oils: fuel oils (including DRO, C10-C25)"

##### **Note 1**

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### Note E (Table 3.2)

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

## Version

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008  
1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26 September 2009; binding date 1 Dec 2010  
2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30 March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures  
3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July 2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**TP114**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**0%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.0192%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 13.5 mg/kg, converted to compound conc.:17.824 mg/kg or 0.00178%)

Cadmium sulphide: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.257 mg/kg or 0.000257%)

Chromium(III) oxide: (Cation conc. entered: 11.2 mg/kg, converted to compound conc.:16.369 mg/kg or 0.00164%)

Copper (I) oxide: (Cation conc. entered: 41 mg/kg, converted to compound conc.:46.161 mg/kg or 0.00462%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 127 mg/kg, converted to compound conc.:191.77 mg/kg or 0.0192%)

Mercury dichloride: (Cation conc. entered: 0.5 mg/kg, converted to compound conc.:0.677 mg/kg or 0.000677%)

Nickel dihydroxide: (Cation conc. entered: 10.1 mg/kg, converted to compound conc.:15.953 mg/kg or 0.0016%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 167 mg/kg, converted to compound conc.:207.867 mg/kg or 0.0208%)



## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en>

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

## Notes utilised in assessment

### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration. Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."



Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note A**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note E (Table 3.2)**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

#### **Version**

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008

1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26

September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30

March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July

2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:

**HP115**

Site:

Project:

Sample Depth:

**0 m**

Dry Weight Moisture Content:

**0%**

Comments:

EWC 2002 code:

Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**

Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.0216%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 10 mg/kg, converted to compound conc.:13.203 mg/kg or 0.00132%)

Cadmium sulphide: (Cation conc. entered: 0.5 mg/kg, converted to compound conc.:0.643 mg/kg or 0.000643%)

Chromium(III) oxide: (Cation conc. entered: 13.1 mg/kg, converted to compound conc.:19.146 mg/kg or 0.00191%)

Copper (I) oxide: (Cation conc. entered: 92 mg/kg, converted to compound conc.:103.582 mg/kg or 0.0104%)

Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 143 mg/kg, converted to compound conc.:215.93 mg/kg or 0.0216%)

Mercury dichloride: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.271 mg/kg or 0.000271%)

Nickel dihydroxide: (Cation conc. entered: 16.2 mg/kg, converted to compound conc.:25.588 mg/kg or 0.00256%)

Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**

Zinc oxide: (Cation conc. entered: 261 mg/kg, converted to compound conc.:324.87 mg/kg or 0.0325%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

## Notes utilised in assessment

### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Zinc oxide"

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R52, R53, R50/53, R51/53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

**Note A**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

**Note E (Table 3.2)**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

**Version**

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008

1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26

September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30

March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July

2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)

## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:  
**HP116**  
Site:

Project:

Sample Depth:  
**0 m**  
Dry Weight Moisture Content:  
**0%**  
Comments:

EWC 2002 code:  
Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**  
Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinand:

Lead compounds (with the exception of those listed separately in this Annex): (0.0223%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 16.6 mg/kg, converted to compound conc.:21.917 mg/kg or 0.00219%)  
Cadmium sulphide: (Cation conc. entered: 0.4 mg/kg, converted to compound conc.:0.514 mg/kg or 0.0000514%)  
Chromium(III) oxide: (Cation conc. entered: 11.4 mg/kg, converted to compound conc.:16.662 mg/kg or 0.00167%)  
Copper (I) oxide: (Cation conc. entered: 59 mg/kg, converted to compound conc.:66.427 mg/kg or 0.00664%)  
Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 148 mg/kg, converted to compound conc.:223.48 mg/kg or 0.0223%)  
Mercury dichloride: (Cation conc. entered: 0.2 mg/kg, converted to compound conc.:0.271 mg/kg or 0.0000271%)  
Nickel dihydroxide: (Cation conc. entered: 11 mg/kg, converted to compound conc.:17.374 mg/kg or 0.00174%)  
Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**  
Zinc oxide: (Cation conc. entered: 201 mg/kg, converted to compound conc.:250.188 mg/kg or 0.025%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

## Notes utilised in assessment

### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Mercury dichloride"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Zinc oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note A**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note E (Table 3.2)**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

#### **Version**

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008

1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26

September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30

March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July

2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)



## Classification



**Non Hazardous Waste**

Classified as **17 05 04**  
in the European Waste Catalogue 2002

## Classified by

Name:  
**Hills, Toby**  
Date:  
**05/06/2013 15:50**  
Telephone:  
**01622 609242**

Company:  
**SLR Consulting**  
**19 Hollingworth Court**  
**Turkey Mill**  
**Maidstone**  
**ME14 5PP**

## Sample details

Sample Name:  
**HP117**  
Site:

Project:

Sample Depth:  
**0 m**  
Dry Weight Moisture Content:  
**0%**  
Comments:

EWC 2002 code:  
Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**  
Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

## Hazard properties

None identified

**Additional: Additional Risk Phrases** "Additional risk phrases apply, please check potential effects. NOTE: These are additional risk phrases and such a risk phrases alone will not cause a waste to be hazardous."

Risk phrases hit:

**R33** "Danger of cumulative effects"

Because of determinands:

Lead compounds (with the exception of those listed separately in this Annex): (0.0184%)  
PCBs/PCTs: (0.000006%)

## Determinands (Dry Weight Moisture Content: 0%)

Arsenic trioxide: (Cation conc. entered: 9.8 mg/kg, converted to compound conc.:12.939 mg/kg or 0.00129%)  
Cadmium sulphide: (Cation conc. entered: 0.6 mg/kg, converted to compound conc.:0.771 mg/kg or 0.0000771%)  
Chromium(III) oxide: (Cation conc. entered: 9.2 mg/kg, converted to compound conc.:13.446 mg/kg or 0.00134%)  
Copper (I) oxide: (Cation conc. entered: 73 mg/kg, converted to compound conc.:82.19 mg/kg or 0.00822%)  
Lead compounds (with the exception of those listed separately in this Annex): (Cation conc. entered: 122 mg/kg, converted to compound conc.:184.22 mg/kg or 0.0184%)  
Mercury dichloride: (Cation conc. entered: <0.1 mg/kg, converted to compound conc.:<0.135 mg/kg or <0.0000135%)  
**IGNORED Because: "<LOD"**  
Nickel dihydroxide: (Cation conc. entered: 8.3 mg/kg, converted to compound conc.:13.11 mg/kg or 0.00131%)  
Selenium compounds (with the exception of cadmium sulphoselenide and sodium selenite): (Cation conc. entered: <1 mg/kg, converted to compound conc.:<1.5 mg/kg or <0.00015%) **IGNORED Because: "<LOD"**  
Zinc oxide: (Cation conc. entered: 291 mg/kg, converted to compound conc.:362.212 mg/kg or 0.0362%)

PCBs/PCTs: (Whole concentration entered as: 0.06 mg/kg or 0.000006%)

## User Defined and non CLP Substances

### Chromium(III) oxide (CAS Number: 1308-38-9)

Comments: Risk phrase data taken from European Chemicals Agency's Classification & Labelling Inventory

Data source:

[http://clp-](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

[inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en](http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=33806&HarmOnly=no?fc=true&lang=en)

Data source date: 26/11/2012

Classification: R20, R22, R36, R37, R38, R42, R43, R60, R61, R50/53

## Notes utilised in assessment

### Additional Risk Phrase Comments

from section: Table 3.1 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"This is an additional risk phrase and such a risk phrase alone will not cause a waste to be hazardous."

Note used on:

Test: "Additional on R33" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "Additional on R33" for determinand: "PCBs/PCTs"

### C14.5.5: Step 5

from section: C14.5 in the document: "[WM2 - Hazardous Waste Technical Guidance](#)"

"Remove dangerous substances below the trace impurity thresholds concentrations from further consideration.

Where an individual dangerous substance is present at a very low concentration it can be excluded from further consideration."

Note used on:

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Arsenic trioxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Chromium(III) oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Copper (I) oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Nickel dihydroxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Zinc oxide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "PCBs/PCTs"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

Test: "H14 on R50/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R52, R53, R52/53" for determinand: "Cadmium sulphide"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

Test: "H14 on R50, R50/53, R51/53, R52, R53, R52/53" for determinand: "Cadmium sulphide"

## Substance notes

### Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note used on:

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note A**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note used on:

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

#### **Note C**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers."

Note used on:

determinand: "PCBs/PCTs"

#### **Note E (Table 3.2)**

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'."

Note used on:

determinand: "Arsenic trioxide"

determinand: "Cadmium sulphide"

determinand: "Lead compounds (with the exception of those listed separately in this Annex)"

determinand: "Nickel dihydroxide"

#### **Version**

Classification utilises the following:

CLP Regulations - Regulation (EC) No 1272/2008 of the European Parliament and of the Council: 16 December 2008

1st ATP - 1st Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 26

September 2009; binding date 1 Dec 2010

2nd ATP - 2nd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 30

March 2011; binding date 1 Dec 2012 in respect of substances and 1 June 2015 in respect of mixtures

3rd ATP - 3rd Adaptation to Technical Progress for European Regulation 1272/2008: Date entered into force 31 July

2012; binding date 1 Dec 2013

HazWasteOnline Engine: WM2 version 2.3 (April 2011) using HWR08

HazWasteOnline Engine Version: 1.0.2191.4965 (10 Apr 2013)

HazWasteOnline Database: 1.0.2177.4949 (24 Mar 2013)



global environmental solutions

#### **AYLESBURY**

7 Wornal Park, Menmarsh Road,  
Worminghall, Aylesbury,  
Buckinghamshire HP18 9PH  
T: +44 (0)1844 337380

#### **BELFAST**

24 Ballynahinch Street, Hillsborough,  
Co. Down, BT26 6AW Northern Ireland  
T: +44 (0)28 9268 9036

#### **BRADFORD-ON-AVON**

Treenwood House, Rowden Lane,  
Bradford-on-Avon, Wiltshire BA15 2AU  
T: +44 (0)1225 309400

#### **BRISTOL**

Langford Lodge, 109 Pembroke Road,  
Clifton, Bristol BS8 3EU  
T: +44 (0)117 9064280

#### **CAMBRIDGE**

8 Stow Court, Stow-cum-Guy,  
Cambridge CB25 9AS  
T: + 44 (0)1223 813805

#### **CARDIFF**

Fulmar House, Beignon Close, Ocean  
Way, Cardiff CF24 5HF  
T: +44 (0)29 20491010

#### **CHELMSFORD**

Unit 77, Waterhouse Business Centre,  
2 Cromar Way, Chelmsford, Essex  
CM1 2QE  
T: +44 (0)1245 392170

#### **DUBLIN**

7 Dundrum Business Park, Windy  
Arbour, Dundrum, Dublin 14 Ireland  
T: + 353 (0)1 2964667

#### **EDINBURGH**

No. 4 The Roundal, Roddinglaw  
Business Park, Gogar, Edinburgh  
EH12 9DB  
T: +44 (0)131 3356830

#### **EXETER**

69 Polsloe Road, Exeter EX1 2NF  
T: + 44 (0)1392 490152

#### **FARNBOROUGH**

The Pavilion, 2 Sherborne Road, South  
Farnborough, Hampshire GU14 6JT  
T: +44 (0)1252 515682

#### **GLASGOW**

4 Woodside Place, Charing Cross,  
Glasgow G3 7QF  
T: +44 (0)141 3535037

#### **HUDDERSFIELD**

Westleigh House, Wakefield Road,  
Denby Dale, Huddersfield HD8 8QJ  
T: +44 (0)1484 860521

#### **LEEDS**

Suite 1, Jason House, Kerry Hill,  
Horsforth, Leeds LS18 4JR  
T: +44 (0)113 2580650

#### **MAIDSTONE**

19 Hollingworth Court, Turkey Mill,  
Maidstone, Kent ME14 5PP  
T: +44 (0)1622 609242

#### **NEWCASTLE UPON TYNE**

Sailors Bethel, Horatio Street,  
Newcastle-upon-Tyne NE1 2PE  
T: +44 (0)191 2611966

#### **NOTTINGHAM**

Aspect House, Aspect Business Park,  
Bennerley Road, Nottingham NG6 8WR  
T: +44 (0)115 9647280

#### **ST. ALBANS**

White House Farm Barns, Gaddesden  
Row, Hertfordshire HP2 6HG  
T: +44 (0)1582 840471

#### **SHEFFIELD**

STEP Business Centre, Wortley Road,  
Deepcar, Sheffield S36 2UH  
T: +44 (0)114 2903628

#### **SHREWSBURY**

Mytton Mill, Forton Heath, Montford  
Bridge, Shrewsbury SY4 1HA  
T: +44 (0)1743 850170

#### **STAFFORD**

8 Parker Court, Staffordshire Technology  
Park, Beaconside, Stafford ST18 0WP  
T: +44 (0)1785 241755

#### **WARRINGTON**

Suite 9 Beech House, Padgate Business  
Park, Green Lane, Warrington WA1 4JN  
T: +44 (0)1925 827218

#### **WORCESTER**

Suite 5, Brindley Court, Gresley Road,  
Shire Business Park, Worcester  
WR4 9FD  
T: +44 (0)1905 751310



Energy



Waste  
Management



Planning &  
Development



Industry



Mining  
& Minerals



Infrastructure

---

## **Appendix B – 2013 Laboratory Analysis**



# Jones Environmental Laboratory

Unit 3 Deeside Point  
Zone 3  
Deeside Industrial Park  
Deeside  
CH5 2UA

SLR Consulting Ltd  
19 Hollingworth Court  
Turkey Mill  
Maidstone  
ME14 5PP

Tel: +44 (0) 1244 833780  
Fax: +44 (0) 1244 833781



No.4225



**Attention :** Dan Collins  
**Date :** 23rd May, 2013  
**Your reference :** 402.0341.00017  
**Our reference :** Test Report 13/4471 Batch 1 Schedule A  
**Location :** MOORWELL  
**Date samples received :** 11th May, 2013  
**Status :** Final report  
**Issue :** 1

Twenty three samples were received for analysis on 11th May, 2013. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

## Compiled By:

**Jamie Williams B.Sc**  
**Project Co-ordinator**

**Bob Millward B.Sc**  
**Principal Chemist**

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-5	6-7	8-10	11-12	13-14	15-16	17-19	20-21	22-23	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP101	TP102	TP103	TP104	TP105	TP106	TP107	TP108	TP109	TP110			
Depth			3.5				1			2			
COC No / misc													
Containers	V J B	V J	V J	V J B	V J	V J	V J	V J B	V J	V J			
Sample Date	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013			
											LOD	Units	Method No.
Arsenic <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	13.6	NDP	NDP	<0.5	mg/kg	TM30/PM15
Barium <sup>#M</sup>	-	-	-	-	-	-	NDP	-	-	-	<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	NDP	-	-	-	<0.5	mg/kg	TM30/PM15
Cadmium <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	0.5	NDP	NDP	<0.1	mg/kg	TM30/PM15
Chromium <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	15.5	NDP	NDP	<0.5	mg/kg	TM30/PM15
Copper <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	70	NDP	NDP	<1	mg/kg	TM30/PM15
Lead <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	128	NDP	NDP	<5	mg/kg	TM30/PM15
Mercury <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	0.3	NDP	NDP	<0.1	mg/kg	TM30/PM15
Nickel <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	13.5	NDP	NDP	<0.7	mg/kg	TM30/PM15
Selenium <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	<1	NDP	NDP	<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	NDP	-	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron <sup>#M</sup>	-	-	-	-	-	-	NDP	-	-	-	<0.1	mg/kg	TM74/PM32
Zinc <sup>#M</sup>	NDP	NDP	NDP	NDP	NDP	NDP	NDP	343	NDP	NDP	<5	mg/kg	TM30/PM15
<b>PAH MS</b>													
Naphthalene <sup>#M</sup>	<0.04	-	<0.04	<0.04	-	<0.04	-	-	0.06	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	<0.03	<0.03	-	<0.03	-	-	0.07	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene <sup>#M</sup>	<0.05	-	<0.05	<0.05	-	<0.05	-	-	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene <sup>#M</sup>	<0.04	-	<0.04	<0.04	-	<0.04	-	-	0.05	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene <sup>#M</sup>	0.03	-	0.07	0.07	-	0.10	-	-	0.60	0.07	<0.03	mg/kg	TM4/PM8
Anthracene <sup>#</sup>	<0.04	-	<0.04	<0.04	-	<0.04	-	-	0.13	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene <sup>#M</sup>	0.09	-	0.32	0.15	-	0.22	-	-	1.10	0.11	<0.03	mg/kg	TM4/PM8
Pyrene <sup>#</sup>	0.09	-	0.28	0.14	-	0.18	-	-	0.90	0.09	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene <sup>#</sup>	0.13	-	0.35	0.14	-	0.21	-	-	0.69	0.09	<0.06	mg/kg	TM4/PM8
Chrysene <sup>#M</sup>	0.12	-	0.31	0.14	-	0.17	-	-	0.60	0.07	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene <sup>#M</sup>	0.25	-	0.66	0.27	-	0.32	-	-	1.02	0.14	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene <sup>#</sup>	0.12	-	0.42	0.14	-	0.17	-	-	0.60	0.07	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene <sup>#M</sup>	0.12	-	0.29	0.10	-	0.14	-	-	0.37	0.05	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene <sup>#</sup>	<0.04	-	0.07	<0.04	-	<0.04	-	-	0.10	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene <sup>#</sup>	0.11	-	0.26	0.11	-	0.13	-	-	0.34	0.06	<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.1	-	3.0	1.3	-	1.6	-	-	6.6	0.8	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.18	-	0.48	0.19	-	0.23	-	-	0.73	0.10	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.07	-	0.18	0.08	-	0.09	-	-	0.29	0.04	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	106	-	106	102	-	102	-	-	108	104	<0	%	TM4/PM8
MTBE <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
Benzene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
Toluene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
Ethylbenzene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
m/p-Xylene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
o-Xylene <sup>#</sup>	<0.005	-	<0.005	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	mg/kg	TM31/PM12
Xylenes (sum of isomers) <sup>#</sup>	<0.01	-	<0.01	<0.01	-	<0.01	-	-	<0.01	<0.01	<0.01	mg/kg	TM31/PM12



# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-5	6-7	8-10	11-12	13-14	15-16	17-19	20-21	22-23	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP101	TP102	TP103	TP104	TP105	TP106	TP107	TP108	TP109	TP110			
Depth			3.5				1			2			
COC No / misc													
Containers	V J B	V J	V J	V J B	V J	V J	V J	V J B	V J	V J			
Sample Date	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013			
											LOD	Units	Method No.
<b>Pesticides MS</b>													
<b>Organochlorine Pesticides</b>													
Aldrin	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Alpha-BHC	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Beta-BHC	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Dieldrin	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Endosulphan I	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Endosulphan II	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Endosulphan sulphate	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Endrin	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Gamma-BHC	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Heptachlor	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Heptachlor Epoxide	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
p,p'-DDE	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
p,p'-DDT	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
p,p'-TDE	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Total Methoxychlor	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
<b>Organophosphorus Pesticides</b>													
Azinphos methyl	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Diazinon	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Dichlorvos	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Disulfoton	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Ethion	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Fenitrothion	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Malathion	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Methyl Parathion	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
Mevinphos	-	-	-	-	<1	-	-	-	-	-	<1	ug/kg	TM42/PM8
<b>TPH CWG</b>													
<b>Aliphatics</b>													
>C5-C6 <sup>#M</sup>	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 <sup>#M</sup>	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 <sup>#M</sup>	<0.2	-	<0.2	<0.2	-	<0.2	-	-	<0.2	<0.2	<0.2	mg/kg	TM5/PM16
>C12-C16 <sup>#M</sup>	<4	-	<4	<4	-	<4	-	-	<4	<4	<4	mg/kg	TM5/PM16
>C16-C21 <sup>#M</sup>	<7	-	<7	<7	-	<7	-	-	<7	<7	<7	mg/kg	TM5/PM16
>C21-C35 <sup>#M</sup>	<7	-	111	41	-	<7	-	-	21	<7	<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	-	111	41	-	<19	-	-	21	<19	<19	mg/kg	TM5/PM16

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-5	6-7	8-10	11-12	13-14	15-16	17-19	20-21	22-23	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP101	TP102	TP103	TP104	TP105	TP106	TP107	TP108	TP109	TP110			
Depth			3.5				1			2			
COC No / misc													
Containers	V J B	V J	V J	V J B	V J	V J	V J	V J B	V J	V J			
Sample Date	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013	24/04/2013			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	LOD	Units	Method No.
<b>TPH CWG</b>													
<b>Aromatics</b>													
>C5-EC7	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 <sup>#M</sup>	<0.1	-	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 <sup>#M</sup>	<0.2	-	<0.2	<0.2	-	<0.2	-	-	<0.2	<0.2	<0.2	mg/kg	TM5/PM16
>EC12-EC16 <sup>#M</sup>	<4	-	<4	<4	-	<4	-	-	<4	<4	<4	mg/kg	TM5/PM16
>EC16-EC21 <sup>#M</sup>	<7	-	<7	<7	-	<7	-	-	<7	<7	<7	mg/kg	TM5/PM16
>EC21-EC35 <sup>#M</sup>	<7	-	76	73	-	<7	-	-	<7	<7	<7	mg/kg	TM5/PM16
Total aromatics C5-35	<19	-	76	73	-	<19	-	-	<19	<19	<19	mg/kg	TM5/PM16
Total aliphatics and aromatics(C5-35)	<38	-	187	114	-	<38	-	-	<38	<38	<38	mg/kg	TM5/PM16
<b>PCBs</b>													
PCB 77	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 81	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 105	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 114	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 118	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 123	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 126	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 156	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 157	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 167	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 169	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
PCB 189	-	-	<5	-	<5	<5	-	-	<5	-	<5	ug/kg	TM16/PM8
Total 12 PCBs	-	-	<60	-	<60	<60	-	-	<60	-	<60	ug/kg	TM16/PM8
<b>Heavy Metals</b>													
Hexavalent Chromium	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Nitrate as NO3 <sup>#M</sup>	-	-	-	NDP	NDP	-	-	-	-	-	<2.5	mg/kg	TM38/PM20
Ortho Phosphate as PO4	-	-	-	NDP	NDP	-	-	-	-	-	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) <sup>#M</sup>	-	-	-	NDP	NDP	-	-	-	-	-	<0.0015	g/l	TM38/PM20
Total Cyanide <sup>#M</sup>	-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	mg/kg	TM89/PM45
Total Organic Carbon <sup>#</sup>	-	-	NDP	NDP	-	NDP	-	1.4	-	NDP	<0.2	%	TM21/PM24
Sample Type	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Dark Brown	Dark Brown	Medium Brown	Medium Brown	Medium Brown	Dark Brown	Medium Brown	Dark Brown		None	PM13/PM0
Other Items	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	Brick/Glass Fragments		None	PM13/PM0
Chromium III	-	-	-	-	-	-	NDP	-	-	-	<0.3	mg/kg	NONE/NONE

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	24-25,49	26-27	28-29	30-31	43-44	45-46	47-48				Please see attached notes for all abbreviations and acronyms		
Sample ID	TP111	TP112	TP113	TP114	HP115	HP116	HP117						
Depth													
COC No / misc													
Containers	V J B	V J	V J	V J	V J	V J	V J						
Sample Date	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013				LOD	Units	Method No.
Arsenic <sup>#M</sup>	NDP	NDP	NDP	13.5	10.0	16.6	NDP				<0.5	mg/kg	TM30/PM15
Barium <sup>#M</sup>	-	-	-	-	-	-	-				<1	mg/kg	TM30/PM15
Beryllium	-	-	-	-	-	-	-				<0.5	mg/kg	TM30/PM15
Cadmium <sup>#M</sup>	NDP	NDP	NDP	0.2	0.5	0.4	NDP				<0.1	mg/kg	TM30/PM15
Chromium <sup>#M</sup>	NDP	NDP	NDP	11.2	13.1	11.4	NDP				<0.5	mg/kg	TM30/PM15
Copper <sup>#M</sup>	NDP	NDP	NDP	41	92	59	NDP				<1	mg/kg	TM30/PM15
Lead <sup>#M</sup>	NDP	NDP	NDP	127	143	148	NDP				<5	mg/kg	TM30/PM15
Mercury <sup>#M</sup>	NDP	NDP	NDP	0.5	0.2	0.2	NDP				<0.1	mg/kg	TM30/PM15
Nickel <sup>#M</sup>	NDP	NDP	NDP	10.1	16.2	11.0	NDP				<0.7	mg/kg	TM30/PM15
Selenium <sup>#M</sup>	NDP	NDP	NDP	<1	<1	<1	NDP				<1	mg/kg	TM30/PM15
Vanadium	-	-	-	-	-	-	-				<1	mg/kg	TM30/PM15
Water Soluble Boron <sup>#M</sup>	-	-	-	-	-	-	-				<0.1	mg/kg	TM74/PM32
Zinc <sup>#M</sup>	NDP	NDP	NDP	167	261	201	NDP				<5	mg/kg	TM30/PM15
<b>PAH MS</b>													
Naphthalene <sup>#M</sup>	-	<0.04	<0.04	-	-	-	-				<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	0.05	0.03	-	-	-	-				<0.03	mg/kg	TM4/PM8
Acenaphthene <sup>#M</sup>	-	<0.05	<0.05	-	-	-	-				<0.05	mg/kg	TM4/PM8
Fluorene <sup>#M</sup>	-	0.05	<0.04	-	-	-	-				<0.04	mg/kg	TM4/PM8
Phenanthrene <sup>#M</sup>	-	0.58	0.18	-	-	-	-				<0.03	mg/kg	TM4/PM8
Anthracene <sup>#</sup>	-	0.15	0.06	-	-	-	-				<0.04	mg/kg	TM4/PM8
Fluoranthene <sup>#M</sup>	-	0.94	0.36	-	-	-	-				<0.03	mg/kg	TM4/PM8
Pyrene <sup>#</sup>	-	0.75	0.34	-	-	-	-				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene <sup>#</sup>	-	0.56	0.28	-	-	-	-				<0.06	mg/kg	TM4/PM8
Chrysene <sup>#M</sup>	-	0.45	0.23	-	-	-	-				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene <sup>#M</sup>	-	0.73	0.36	-	-	-	-				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene <sup>#</sup>	-	0.43	0.18	-	-	-	-				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene <sup>#M</sup>	-	0.27	0.16	-	-	-	-				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene <sup>#</sup>	-	0.07	<0.04	-	-	-	-				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene <sup>#</sup>	-	0.25	0.14	-	-	-	-				<0.04	mg/kg	TM4/PM8
PAH 16 Total	-	5.3	2.3	-	-	-	-				<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	0.53	0.26	-	-	-	-				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	0.20	0.10	-	-	-	-				<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	123	92	-	-	-	-				<0	%	TM4/PM8
MTBE <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
Benzene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
Toluene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
Ethylbenzene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
m/p-Xylene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
o-Xylene <sup>#</sup>	-	<0.005	<0.005	-	-	-	-				<0.005	mg/kg	TM31/PM12
Xylenes (sum of isomers) <sup>#</sup>	-	<0.01	<0.01	-	-	-	-				<0.01	mg/kg	TM31/PM12

# Jones Environmental Laboratory

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	24-25,49	26-27	28-29	30-31	43-44	45-46	47-48				Please see attached notes for all abbreviations and acronyms		
Sample ID	TP111	TP112	TP113	TP114	HP115	HP116	HP117						
Depth													
COC No / misc													
Containers	V J B	V J	V J	V J	V J	V J	V J						
Sample Date	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013				LOD	Units	Method No.
<b>Pesticides MS</b>													
<b>Organochlorine Pesticides</b>													
Aldrin	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Alpha-BHC	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Beta-BHC	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Dieldrin	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Endosulphan I	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Endosulphan II	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Endosulphan sulphate	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Endrin	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Gamma-BHC	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Heptachlor	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Heptachlor Epoxide	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
p,p'-DDE	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
p,p'-DDT	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
p,p'-TDE	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Total Methoxychlor	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
<b>Organophosphorus Pesticides</b>													
Azinphos methyl	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Diazinon	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Dichlorvos	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Disulfoton	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Ethion	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Fenitrothion	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Malathion	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Methyl Parathion	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
Mevinphos	-	-	-	-	-	-	-				<1	ug/kg	TM42/PM8
<b>TPH CWG</b>													
<b>Aliphatics</b>													
>C5-C6 <sup>#M</sup>	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>C6-C8 <sup>#M</sup>	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>C8-C10	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>C10-C12 <sup>#M</sup>	-	<0.2	<0.2	-	-	-	-				<0.2	mg/kg	TM5/PM16
>C12-C16 <sup>#M</sup>	-	<4	18	-	-	-	-				<4	mg/kg	TM5/PM16
>C16-C21 <sup>#M</sup>	-	<7	103	-	-	-	-				<7	mg/kg	TM5/PM16
>C21-C35 <sup>#M</sup>	-	71	162	-	-	-	-				<7	mg/kg	TM5/PM16
Total aliphatics C5-35	-	71	283	-	-	-	-				<19	mg/kg	TM5/PM16

# Jones Environmental Laboratory

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	24-25,49	26-27	28-29	30-31	43-44	45-46	47-48				Please see attached notes for all abbreviations and acronyms		
Sample ID	TP111	TP112	TP113	TP114	HP115	HP116	HP117						
Depth													
COC No / misc													
Containers	V J B	V J	V J	V J	V J	V J	V J						
Sample Date	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013	25/04/2013						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013	11/05/2013				LOD	Units	Method No.
<b>TPH CWG</b>													
<b>Aromatics</b>													
>C5-EC7	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>EC7-EC8	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>EC8-EC10 <sup>#M</sup>	-	<0.1	<0.1	-	-	-	-				<0.1	mg/kg	TM36/PM12
>EC10-EC12 <sup>#M</sup>	-	<0.2	<0.2	-	-	-	-				<0.2	mg/kg	TM5/PM16
>EC12-EC16 <sup>#M</sup>	-	<4	<4	-	-	-	-				<4	mg/kg	TM5/PM16
>EC16-EC21 <sup>#M</sup>	-	<7	12	-	-	-	-				<7	mg/kg	TM5/PM16
>EC21-EC35 <sup>#M</sup>	-	117	244	-	-	-	-				<7	mg/kg	TM5/PM16
Total aromatics C5-35	-	117	256	-	-	-	-				<19	mg/kg	TM5/PM16/PM20
Total aliphatics and aromatics(C5-35)	-	188	539	-	-	-	-				<38	mg/kg	TM5/PM16/PM20
<b>PCBs</b>													
PCB 77	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 81	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 105	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 114	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 118	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 123	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 126	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 156	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 157	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 167	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 169	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
PCB 189	-	-	-	-	-	-	<5				<5	ug/kg	TM16/PM8
Total 12 PCBs	-	-	-	-	-	-	<60				<60	ug/kg	TM16/PM8
<b>Heavy Metals</b>													
Hexavalent Chromium	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Nitrate as NO3 <sup>#M</sup>	-	-	-	-	-	-	-				<2.5	mg/kg	TM38/PM20
Ortho Phosphate as PO4	-	-	-	-	-	-	-				<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) <sup>#M</sup>	-	-	-	-	-	-	-				<0.0015	g/l	TM38/PM20
Total Cyanide <sup>#M</sup>	-	-	-	-	-	-	-				<0.5	mg/kg	TM89/PM45
Total Organic Carbon <sup>#</sup>	NDP	-	NDP	-	1.8	-	-				<0.2	%	TM21/PM24
Sample Type	Loam	Loam	Loam	Loam	Loam	Loam	Loam				None		PM13/PM0
Sample Colour	Light Brown	Medium Brown	Light Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown				None		PM13/PM0
Other Items	n.a	Stones	Stones	n.a	n.a	n.a	n.a				None		PM13/PM0
Chromium III	-	-	-	-	-	-	-				<0.3	mg/kg	NONE/NONE

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

# **Jones Environmental Laboratory**

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report :** CEN 10:1 1 Batch

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	6-7	13-14	20-21	26-27							Please see attached notes for all abbreviations and acronyms		
Sample ID	TP103	TP106	TP109	TP112									
Depth	3.5												
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	24/04/2013	24/04/2013	24/04/2013	25/04/2013									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	11/05/2013	11/05/2013	11/05/2013	11/05/2013							LOD	Units	Method No.
<b>TPH CWG</b>													
<b>Aliphatics</b>													
>C5-C6	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>C6-C8	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>C8-C10	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>C10-C12	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM5/PM30
>C12-C16	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
>C16-C21	0.19	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
>C21-C35	13.26	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
Total aliphatics C5-35	13.45	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/TM36/PM30
<b>Aromatics</b>													
>C5-EC7	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>EC7-EC8	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>EC8-EC10	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM36/PM12
>EC10-EC12	<0.005	<0.005	<0.005	<0.005							<0.005	mg/l	TM5/PM30
>EC12-EC16	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
>EC16-EC21	<0.01	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
>EC21-EC35	0.79	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
Total aromatics C5-35	0.79	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/PM30
Total aliphatics and aromatics(C5-35)	14.24	<0.01	<0.01	<0.01							<0.01	mg/l	TM5/TM36/PM30
Dissolved Organic Carbon	6	4	-	-							<2	mg/l	TM60/PM0
Hexavalent Chromium	<0.03	<0.03	<0.03	<0.03							<0.03	mg/l	TM38/PM0
Total Xylenes	<5	<5	<5	<5							<5	ug/l	TM15/PM10
PCB 77	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 81	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 105	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 114	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 118	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 123	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 126	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 156	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 157	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 167	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 169	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
PCB 189	<0.1	<0.1	<0.1	-							<0.1	ug/l	TM17/PM30
Total 12 PCBs	<1.2	<1.2	<1.2	-							<1.2	ug/l	TM17/PM30



**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins

**Note:**

Analysis was carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions lie outside the scope of our UKAS accreditation.

*Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.*

*If asbestos fibres are reported at trace levels there will not be enough fibres to quantify and will be less than 0.001%.*

Signed on behalf of Jones Environmental Laboratory:



Gemma Newsome  
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Description	Asbestos Results
13/4471	1	TP101		1-3	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundles, Soil-Silt/Stone/Brick/Trace Fibre	Amosite, Chrysotile, Crocidolite
13/4471	1	TP102		4-5	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundle, Soil-Silt/Stone/Brick/Fibre Bundles	Amosite, Chrysotile
13/4471	1	TP103	3.5	6-7	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundle, Soil-Silt/Stone/Brick/Fibre Bundles	Amosite, Chrysotile
13/4471	1	TP104		8-10	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundles	Chrysotile
13/4471	1	TP105		11-12	20/05/2013	Soil-Silt/Stone/Brick/Fibre Bundle	Chrysotile
13/4471	1	TP106		13-14	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Trace Fibres	Chrysotile
13/4471	1	TP107	1	15-16	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Fibre Bundles	Chrysotile
13/4471	1	TP108		17-19	20/05/2013	Soil-Silt/Stone/Brick/MMMF	NAD
13/4471	1	TP109		20-21	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Fibre Bundle	Chrysotile
13/4471	1	TP110	2	22-23	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Fibre Bundle	Amosite, Chrysotile
13/4471	1	TP111		24-25,49	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Fibre Bundle	Chrysotile
13/4471	1	TP112		26-27	20/05/2013	Soil-Silt/Brick/Stone/MMMF/Tile, Soil-Silt/Brick/Stone/MMMF/Trace Fibres	Amosite, Chrysotile, Crocidolite
13/4471	1	TP113		28-29	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Trace Fibres	Chrysotile
13/4471	1	TP114		30-31	20/05/2013	Soil-Silt/Stone/Brick/MMMF	NAD
13/4471	1	ASBESTOS1		41	16/05/2013	Tile-MMMF	NAD
13/4471	1	ASBESTOS2		42	16/05/2013	Tile-MMMF/Woodchip	NAD
13/4471	1	HP115		43-44	20/05/2013	Soil-Silt/Stone/Brick/MMMF	NAD
13/4471	1	HP116		45-46	20/05/2013	Soil-Silt/Stone/Brick/MMMF	NAD
13/4471	1	HP117		47-48	20/05/2013	Soil-Silt/Stone/Brick/MMMF/Trace Fibres	Chrysotile
13/4471	1	ASBESTOS3		50	16/05/2013	Tile	Chrysotile

**Client Name:** SLR Consulting Ltd

**Matrix : Solid**

**Reference:** 402.0341.00017

**Location:** MOORWELL

**Contact:** Dan Collins

[illegible]

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 13/4471

## SOILS

Please note we are only MCERTS accredited for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. If we are instructed to keep samples, a storage charge of £1 (1.5 Euros) per sample per month will be applied until we are asked to dispose of them.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## WATERS

Please note we are not a Drinking Water Inspectorate (DWI) Approved Laboratory. It is important that detection limits are carefully considered when requesting water analysis.

UKAS accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

## SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

## NOTE

Data is only accredited when all the requirements of our Quality System have been met. In certain circumstances where the requirements have not been met, the laboratory may issue the data in an interim report but will remove the accreditation, in this instance results should be considered indicative only. Where possible samples will be re-extracted and a final report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

**ABBREVIATIONS and ACRONYMS USED**

#	UKAS accredited.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance.
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
CO	Suspected carry over
OC	Outside Calibration Range
NFD	No Fibres Detected

**JE Job No** 13/4471

[illegible]



# Jones Environmental Laboratory

Unit 3 Deeside Point  
Zone 3  
Deeside Industrial Park  
Deeside  
CH5 2UA

SLR Consulting Ltd  
19 Hollingworth Court  
Turkey Mill  
Maidstone  
ME14 5PP

Tel: +44 (0) 1244 833780  
Fax: +44 (0) 1244 833781



No.4225



<b>Attention :</b>	Dan Collins
<b>Date :</b>	4th June, 2013
<b>Your reference :</b>	402.0341.00017
<b>Our reference :</b>	Test Report 13/4471 Batch 1 Schedule C
<b>Location :</b>	MOORWELL
<b>Date samples received :</b>	11th May, 2013
<b>Status :</b>	Final report
<b>Issue :</b>	1

Twenty three samples were received for analysis on 11th May, 2013. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

## Compiled By:

**Jamie Williams B.Sc**  
Project Co-ordinator

**Bob Millward B.Sc**  
Principal Chemist

**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms



**Client Name:** SLR Consulting Ltd  
**Reference:** 402.0341.00017  
**Location:** MOORWELL  
**Contact:** Dan Collins  
**JE Job No.:** 13/4471

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	26-27	28-29	47-48								Please see attached notes for all abbreviations and acronyms		
Sample ID	TP112	TP113	HP117										
Depth													
COC No / misc													
Containers	V J	V J	V J										
Sample Date	25/04/2013	25/04/2013	25/04/2013										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	11/05/2013	11/05/2013	11/05/2013										
Arsenic	15.5	50.4	9.8								<0.5	mg/kg	TM30/PM62
Barium	-	-	-								<1	mg/kg	TM30/PM62
Beryllium	-	-	-								<0.5	mg/kg	TM30/PM62
Cadmium	0.3	0.8	0.6								<0.1	mg/kg	TM30/PM62
Chromium	11.1	71.6	9.2								<0.5	mg/kg	TM30/PM62
Copper	34	59	73								<1	mg/kg	TM30/PM62
Lead	192	163	122								<5	mg/kg	TM30/PM62
Mercury	0.2	0.2	<0.1								<0.1	mg/kg	TM30/PM62
Nickel	8.5	52.7	8.3								<0.7	mg/kg	TM30/PM62
Selenium	<1	<1	<1								<1	mg/kg	TM30/PM62
Vanadium	-	-	-								<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	-								<0.1	mg/kg	TM74/PM61
Zinc	232	173	291								<5	mg/kg	TM30/PM62
Nitrate as NO3 <sup>#M</sup>	-	-	-								<2.5	mg/kg	TM38/PM60
Ortho Phosphate as PO4	-	-	-								<0.3	mg/kg	TM38/PM60
Sulphate as SO4 (2:1 Ext) <sup>#M</sup>	-	-	-								<0.0015	g/l	TM38/PM60
Asbestos PCOM Quantification*	-	-	-								<0.001	mass %	Subcontracted

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 13/4471

## SOILS

Please note we are only MCERTS accredited for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. If we are instructed to keep samples, a storage charge of £1 (1.5 Euros) per sample per month will be applied until we are asked to dispose of them.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## WATERS

Please note we are not a Drinking Water Inspectorate (DWI) Approved Laboratory. It is important that detection limits are carefully considered when requesting water analysis.

UKAS accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

## SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

## NOTE

Data is only accredited when all the requirements of our Quality System have been met. In certain circumstances where the requirements have not been met, the laboratory may issue the data in an interim report but will remove the accreditation, in this instance results should be considered indicative only. Where possible samples will be re-extracted and a final report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

**ABBREVIATIONS and ACRONYMS USED**

#	UKAS accredited.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance.
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
CO	Suspected carry over
OC	Outside Calibration Range
NFD	No Fibres Detected



**JE Job No** 13/4471

[illegible]

---

## **Appendix C – Asbestos Air Monitoring Results**

## AIR MONITORING REPORT

This certificate is for attention of	Dan Collins, SLR Consulting Ltd, 19 Hollingsworth Court, Turkey Mill, Ashford Road, Maidstone, ME14 5PP
Site Address	Moorwell Waste Facility, St Mary's Island, Isles of Scilly
Work Area / Description of Works	Investigation into the nature of stockpiled waste materials
Asbestos Removal Contractor	N/A
Contractor Representative On Site	Dan Collins
Outcome of Test Results	Airborne fibre levels are below 0.01f/cm <sup>3</sup> - this is below the limit of detection of the method employed
Lucion Environmental Ltd Test Report No.	24276
Report Issue Date	2013/04/24
Lucion Analyst(s) on Site	Mr Adam Yates Analyst
Lucion Analyst(s) Authorised Signature(s)	 

**Sampling & Evaluation Methods**

In-house methods TOP02.08 & TOP02.09 in accordance with HSG 248 – Asbestos: The Analyst's Guide For Sampling, Analysis and Clearance Procedures H.S.E. 2005.

**Notes:** The samples referred to in this report will be retained for 6 months unless requested otherwise. Unless otherwise stated, there are no departures from the sampling and evaluation methods specified. Results detailed in this report relate only to the time, and corresponding conditions prevailing, when the sampling and examination were undertaken.

**Notes to Test Accuracy:**

Airflow measured on site is recorded against a correction chart.

Flow meters are calibrated against a UKAS certified master flow meter accurate to  $\pm 0.5\%$ .

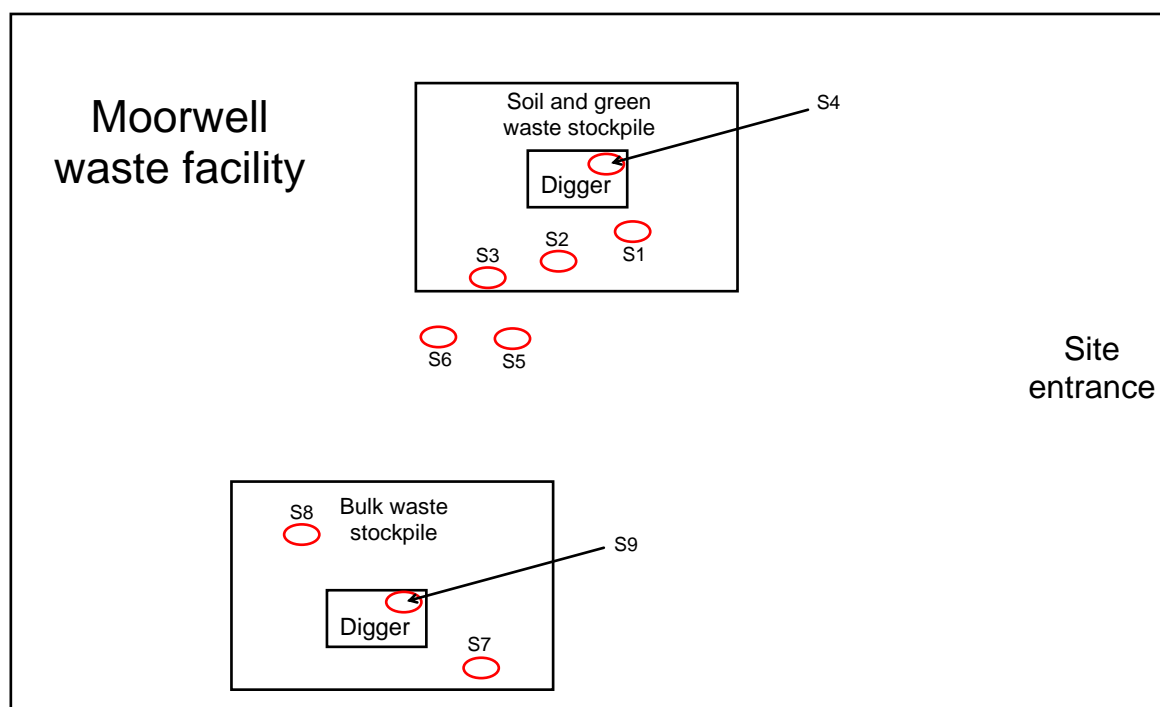
In accordance with HSG248, if the combined effect of ambient temperature and pressure between calibration and sampling location exceeds 5% a correction is applied to the air sample volume. The calculated fibre concentration is given for each air sample taken. Where the corresponding reported fibre concentration is preceded by "<", the lower limit of quantification (LOQ) of the method has not been reached. For a 480 litre air sample with 200 graticule areas counted, the (LOQ) of this method is 0.010 fibres per ml of air; samples of less volume/graticules will be reported to a lower LOQ (refer count sheet).

While counting randomly distributed fibres, an expected degree of variation of 1.5 standard deviations from the mean count may occur. At clearance indicator level (0.01 fibres per ml of air) a 480-litre air sample yielding a count of 20 fibres over 200 fields would have an expected standard deviation of  $\pm 8$  fibres.

Any opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This certificate is valid only when it bears the signature of an authorised member of Lucion personnel. Unsigned copy certificates are retained by Lucion. Refer Lucion Count Sheet Attached For Test Results

Report Attachment Summary	Yes	No	Details	
A sampling plan is attached to this report	✓			
Photograph(s) are attached to this report		✗	Photo 1	
			Photo 2	
			Photo 3	
			Photo 4	
An additional statement from the analyst is attached to this report		✗		

## Sampling Plan





The above sampling plan is NOT to scale and is intended for the purposes of showing approximate locations of air samples as reported overleaf.

## Additional Comments



## AIR MONITORING REPORT

This certificate is for attention of	Dan Collins, SLR Consulting Ltd, 19 Hollingsworth Court, Turkey Mill, Ashford Road, Maidstone, ME14 5PP
Site Address	Moorwell Waste Facility, St Mary's Island, Isles of Scilly
Work Area / Description of Works	Investigation into the nature of stockpiled waste materials
Asbestos Removal Contractor	N/A
Contractor Representative On Site	Dan Collins
Outcome of Test Results	Airborne fibre levels are below 0.01f/cm <sup>3</sup> - this is below the limit of detection of the method employed
Lucion Environmental Ltd Test Report No.	24276
Report Issue Date	2013/04/25
Lucion Analyst(s) on Site	Mr Adam Yates Analyst
Lucion Analyst(s) Authorised Signature(s)	 

**Sampling  
&  
Evaluation  
Methods**

In-house methods TOP02.08 & TOP02.09 in accordance with HSG 248 – Asbestos: The Analyst's Guide For Sampling, Analysis and Clearance Procedures H.S.E. 2005.

**Notes:** The samples referred to in this report will be retained for 6 months unless requested otherwise. Unless otherwise stated, there are no departures from the sampling and evaluation methods specified. Results detailed in this report relate only to the time, and corresponding conditions prevailing, when the sampling and examination were undertaken.

**Notes to Test Accuracy:**

Airflow measured on site is recorded against a correction chart.

Flow meters are calibrated against a UKAS certified master flow meter accurate to  $\pm 0.5\%$ .

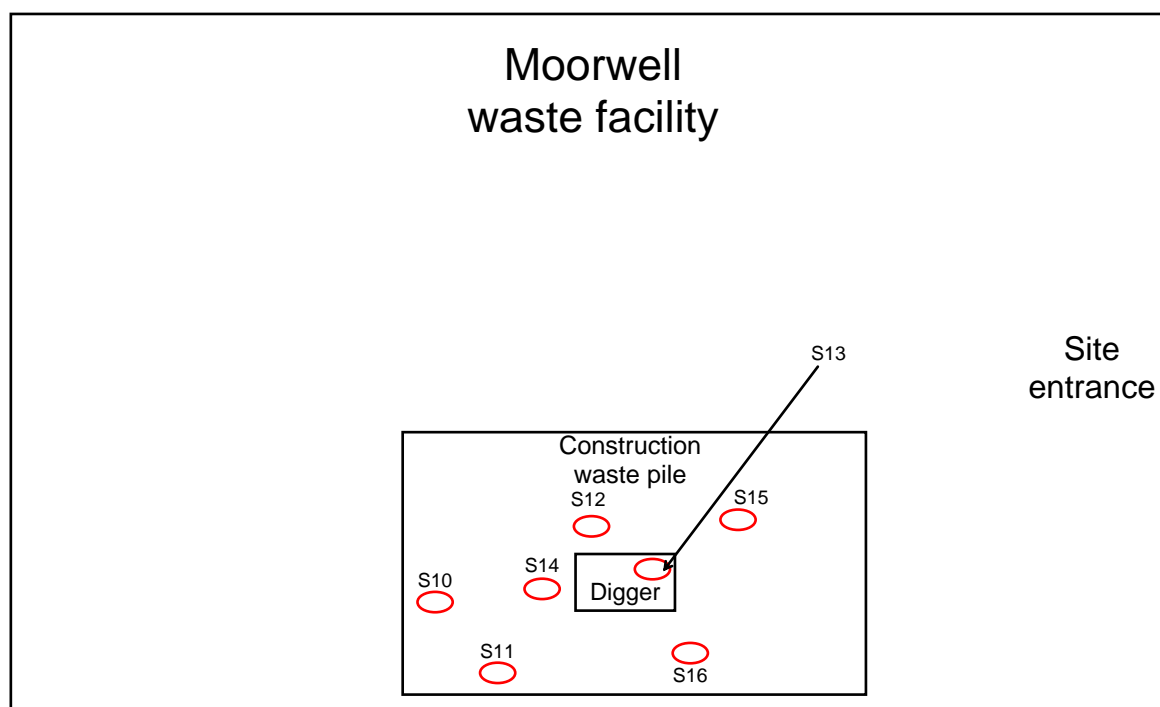
In accordance with HSG248, if the combined effect of ambient temperature and pressure between calibration and sampling location exceeds 5% a correction is applied to the air sample volume. The calculated fibre concentration is given for each air sample taken. Where the corresponding reported fibre concentration is preceded by "<", the lower limit of quantification (LOQ) of the method has not been reached. For a 480 litre air sample with 200 graticule areas counted, the (LOQ) of this method is 0.010 fibres per ml of air; samples of less volume/graticules will be reported to a lower LOQ (refer count sheet).

While counting randomly distributed fibres, an expected degree of variation of 1.5 standard deviations from the mean count may occur. At clearance indicator level (0.01 fibres per ml of air) a 480-litre air sample yielding a count of 20 fibres over 200 fields would have an expected standard deviation of  $\pm 8$  fibres.

Any opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This certificate is valid only when it bears the signature of an authorised member of Lucion personnel. Unsigned copy certificates are retained by Lucion. Refer Lucion Count Sheet Attached For Test Results

Report Attachment Summary	Yes	No	Details	
A sampling plan is attached to this report	✓			
Photograph(s) are attached to this report		✗	Photo 1	
			Photo 2	
			Photo 3	
			Photo 4	
An additional statement from the analyst is attached to this report		✗		

## Sampling Plan



The above sampling plan is NOT to scale and is intended for the purposes of showing approximate locations of air samples as reported overleaf.

## Additional Comments

Air Sampling & Fibre Counting								Lucion Report No.		24276						
Air Volume Correction Detail					Microscope & Calculation Detail											
Sample No. Range	Date	T Cal (K)	T Site (C)	Pcal (hPa)	Psite (hPa)	Correction Required	Sample No.Range	Date	Micro No.	Graticule Dia (µm)	Test Slide Result (Grid No.)	Filter Dia. Exposed (mm)	Field Blank	Sampled By	Counted By	
1-9	2013/04/24	293	14.1	1014	1026	None	1-9	2013/04/24	MS34	100	7	22.5	n/a	AWY	AWY	
Instrument Detail																
Thermo	WS40	Baro	WS40	Flow (Hi)	FM78	Flow (Low)	FM82	Timepiece	WS40	HSE/NPL	5739		Grat Slide	SM30		
Sample Detail																
Sample No.	Sample Location	Test Code	Head No.	Pump No.	Time On (hh:mm)	Time Off (hh:mm)	Run Time (mins)	Start Flow (lmin <sup>-1</sup> )	Int Flow (lmin <sup>-1</sup> )	End Flow (lmin <sup>-1</sup> )	Calc. Volume (l)	Corr. Volume (l)	Fibres	Fields	Calc. Conc. (Fibresml <sup>-1</sup> )	Report. Conc. (Fibresml <sup>-1</sup> )
24276-1	Adjacent soil and green waste stockpile during works	R	H202	SP113	13:28	14:02	34	16		16	544	544	2	200	0.001	<0.01
24276-2	Adjacent soil and green waste stockpile during works	R	H199	SP82	13:29	14:03	34	16		16	544	544	2	200	0.001	<0.01
24276-3	Adjacent soil and green waste stockpile during works	R	H130	SP77	13:30	14:04	34	16		16	544	544	1	200	0.000	<0.01
24276-4	Personal on C.Guy in digger cabin during works	P	H116	PP33	13:31	14:47	76	2		2	152	152	3.5	200	0.006	<0.03
24276-5	Adjacent soil and greenwaste stockpile during works	R	H202	SP113	14:12	14:43	31	16		16	496	496	1	200	0.001	<0.01
24276-6	Adjacent soil and greenwaste stockpile during works	R	H79	SP82	14:13	14:44	31	16		16	496	496	0.5	200	0.000	<0.01
24276-7	Adjacent bulk waste stockpile during works	R	H116	SP113	15:33	16:09	36	16		16	576	576	4	200	0.002	<0.01
24276-8	Adjacent bulk waste stockpile during works	R	H79	SP77	15:34	16:10	36	16		16	576	576	2	200	0.001	<0.01
24276-9	Personal on C.Guy in digger cabin during works	P	H	PP33	15:35	16:48	73	2		2	146	146	4.5	200	0.008	<0.02

This air sampling report and count sheet is only valid when accompanied by a Lucion report bearing an authorised signature. Where calculated fibre concentration is below the limit of quantification of the method and sample volume (V) is less than 480 litres and/or less than 200 graticule areas (N) have been examined; the reportable concentration will be given as  $(96000 / (V \times N)) \times 0.010$ .

Air Sampling & Fibre Counting								Lucion Report No.		24276						
Air Volume Correction Detail					Microscope & Calculation Detail											
Sample No. Range	Date	T Cal (K)	T Site (C)	Pcal (hPa)	Psite (hPa)	Correction Required	Sample No.Range	Date	Micro No.	Graticule Dia (µm)	Test Slide Result (Grid No.)	Filter Dia. Exposed (mm)	Field Blank	Sampled By	Counted By	
10-16	2013/04/25	293	11.9	1014	1023	None	10-16	2013/04/25	MS34	100	7	22.5	n/a	AWY	AWY	
Instrument Detail																
Thermo	WS40	Baro	WS40	Flow (Hi)	FM78	Flow (Low)	FM82	Timepiece	WS40	HSE/NPL	5739		Grat Slide	SM30		
Sample Detail																
Sample No.	Sample Location	Test Code	Head No.	Pump No.	Time On (hh:mm)	Time Off (hh:mm)	Run Time (mins)	Start Flow (lmin <sup>-1</sup> )	Int Flow (lmin <sup>-1</sup> )	End Flow (lmin <sup>-1</sup> )	Calc. Volume (l)	Corr. Volume (l)	Fibres	Fields	Calc. Conc. (Fibresml <sup>-1</sup> )	Report. Conc. (Fibresml <sup>-1</sup> )
24276-10	Adjacent construction waste stockpile during works	R	H202	SP113	10:12	10:45	33	16		16	528	528	1	200	0.000	<0.01
24276-11	Adjacent construction waste stockpile during works	R	H199	SP82	10:13	10:46	33	16		16	528	528	2	200	0.001	<0.01
24276-12	Adjacent construction waste stockpile during works	R	H116	SP77	10:14	10:47	33	16		16	528	528	1	200	0.000	<0.01
24276-13	Personal on C.Guy in digger cabin during works	P	H79	PP33	10:15	11:19	64	2		2	128	128	3	200	0.006	<0.01
24276-14	Adjacent construction waste stockpile during works	R	H199	SP113	10:50	11:20	30	16		16	480	480	4	200	0.002	<0.01
24276-15	Adjacent construction waste stockpile during works	R	H116	SP82	10:51	11:21	30	16		16	480	480	2	200	0.001	<0.01
24276-16	Adjacent construction waste stockpile during works	R	H130	SP77	10:52	11:22	30	16		16	480	480	2	200	0.001	<0.01

This air sampling report and count sheet is only valid when accompanied by a Lucion report bearing an authorised signature. Where calculated fibre concentration is below the limit of quantification of the method and sample volume (V) is less than 480 litres and/or less than 200 graticule areas (N) have been examined; the reportable concentration will be given as  $(96000 / (V \times N)) \times 0.010$ .

**ABERDEEN**

214 Union Street,  
Aberdeen AB10 1TL, UK  
T: +44 (0)1224 517405

**AYLESBURY**

7 Wornal Park, Menmarsh Road,  
Worminghall, Aylesbury,  
Buckinghamshire HP18 9PH, UK  
T: +44 (0)1844 337380

**BELFAST**

Suite 1 Potters Quay, 5 Ravenhill Road,  
Belfast BT6 8DN, UK, Northern Ireland  
T: +44 (0)28 9073 2493

**BRADFORD-ON-AVON**

Treenwood House, Rowden Lane,  
Bradford-on-Avon, Wiltshire BA15 2AU,  
UK  
T: +44 (0)1225 309400

**BRISTOL**

Langford Lodge, 109 Pembroke Road,  
Clifton, Bristol BS8 3EU, UK  
T: +44 (0)117 9064280

**CAMBRIDGE**

8 Stow Court, Stow-cum-Quy,  
Cambridge CB25 9AS, UK  
T: + 44 (0)1223 813805

**CARDIFF**

Fulmar House, Beignon Close, Ocean  
Way, Cardiff CF24 5PB, UK  
T: +44 (0)29 20491010

**CHELMSFORD**

Unit 77, Waterhouse Business Centre,  
2 Cromar Way, Chelmsford, Essex  
CM1 2QE, UK  
T: +44 (0)1245 392170

**DUBLIN**

7 Dundrum Business Park, Windy  
Arbour, Dundrum, Dublin 14 Ireland  
T: + 353 (0)1 2964667

**EDINBURGH**

4/5 Lochside View, Edinburgh Park,  
Edinburgh EH12 9DH, UK  
T: +44 (0)131 3356830

**EXETER**

69 Polsloe Road, Exeter EX1 2NF, UK  
T: + 44 (0)1392 490152

**GLASGOW**

4 Woodside Place, Charing Cross,  
Glasgow G3 7QF, UK  
T: +44 (0)141 3535037

**GRENOBLE**

BuroClub, 157/155 Cours Berriat,  
38028 Grenoble Cedex 1, France  
T: +33 (0)4 76 70 93 41

**GUILDFORD**

65 Woodbridge Road, Guildford  
Surrey GU1 4RD, UK  
T: +44 (0)1483 889 800

**LEEDS**

Suite 1, Jason House, Kerry Hill,  
Horsforth, Leeds LS18 4JR, UK  
T: +44 (0)113 2580650

**LONDON**

83 Victoria Street,  
London, SW1H 0HW, UK  
T: +44 (0)203 691 5810

**MAIDSTONE**

19 Hollingworth Court, Turkey Mill,  
Maidstone, Kent ME14 5PP, UK  
T: +44 (0)1622 609242

**MANCHESTER**

Digital World Centre, 1 Lowry Plaza,  
The Quays, Salford, Manchester  
M50 3UB, UK  
T: +44 (0)161 216 4064

**NEWCASTLE UPON TYNE**

Sailors Bethel, Horatio Street,  
Newcastle-upon-Tyne NE1 2PE, UK  
T: +44 (0)191 2611966

**NOTTINGHAM**

Aspect House, Aspect Business Park,  
Bennerley Road, Nottingham NG6 8WR,  
UK  
T: +44 (0)115 9647280

**SHEFFIELD**

Unit 2 Newton Business Centre,  
Thornccliffe Park Estate, Newton  
Chambers Road, Chapeltown,  
Sheffield S35 2PW, UK  
T: +44 (0)114 2455153

**SHREWSBURY**

2<sup>nd</sup> Floor, Hermes House, Oxon  
Business Park, Shrewsbury SY3 5HJ,  
UK  
T: +44 (0)1743 239250

**STAFFORD**

8 Parker Court, Staffordshire Technology  
Park, Beaconside, Stafford ST18 0WP,  
UK  
T: +44 (0)1785 241755

**STIRLING**

No. 68 Stirling Business Centre,  
Wellgreen, Stirling FK8 2DZ, UK  
T: +44 (0)1786 239900

**WORCESTER**

Suite 5, Brindley Court, Gresley Road,  
Shire Business Park, Worcester WR4  
9FD, UK  
T: +44 (0)1905 751310

[www.slrconsulting.com](http://www.slrconsulting.com)



Industry



Infrastructure



Mining & Minerals



Oil & Gas



Planning & Development



Renewable & Low Carbon



Waste Management