

14092/RJH

15 April 2024

Lovell Partnerships Ltd  
Greenmeadow Business Park  
Unit 5  
Cae Gwyrdd  
Cardiff  
CF15 7AB

**For the attention of Mr Neil Thomas**

Dear Sirs,

**Former Whiteheads Steelworks, Mendalgief Road, Newport, NP20 2HY**  
**NHBC Outstanding Land Quality Conditions, Ref: 216335 LQ conditions LQ5 & LQ6.**  
**Planning Permission Number RM1-18/1039, RM2-18/1142 and RM3-21/0464**  
**Validation of Imported Clean Cover to Plots 481 to 483 and 357.**

Intégral Géotechnique were appointed by the Lovell Partnerships Limited to carry out the clean cover validation inspections to soft landscaped and garden areas within the above development as the site build program progresses. We can report the clean cover soil validation works within the above development site as follows.

This report (including all appendices to it and any subsequent addendums or correspondence) has been prepared for the sole benefit, use and information of the Lovell Partnerships Limited and no third party is entitled to rely on it. This report may not be used, reproduced or circulated (in whole or part) for any purpose without the written consent of Intégral Géotechnique (Wales) Limited. Intégral Géotechnique (Wales) Limited shall not be liable to any third party who does not have such written permission to rely on the report for any losses they may suffer.

This information is submitted in support of the discharge of conditions of the following consents and/or warranties.

| Regulator                                    | Reference                                |
|----------------------------------------------|------------------------------------------|
| Local Authority Planning Permission Number   | RM1-18/1039, RM2-18/1142 and RM3-21/0464 |
| NHBC outstanding Land Quality Conditions Ref | 216335 LQ conditions LQ5 & LQ6           |

The required remedial measures regarding the requirement to mitigate land contamination risks at the above site comprise the placement of a clean 600mm capping layer to be incorporated within the soft landscaped and garden areas of the new development. This capping layer is to be underlain by a hi-visibility geotextile membrane.

### **Remedial Strategy Requirements (Clean Capping Layer)**

1. The upper 600 mm of fill used in the clean capping layer in all garden and soft finished areas are to be chemically tested and UKAS accredited laboratory analysis certificates supplied. The capping system is to comprise of imported clean inert materials conforming to the Requirements for the Chemical Testing of Imported Materials for Various End Uses and Validation of Cover Systems prepared by Welsh Land Contamination Working Group and to satisfy appropriate soil guideline values for residential developments with gardens. Samples of the topsoil and subsoil will be taken for laboratory analysis, at a frequency of 1 in every 4 gardens.
2. Topsoil brought to the site will require a laboratory analysis certificate confirming its suitability for use and sampling prior to placement to confirm its chemical suitability (minimum of three samples per source).
3. Subsoil will require a laboratory analysis certificate confirming its suitability for use and sampling prior to placement to confirm its chemical suitability (minimum of three samples per source).
4. Following placement of the imported topsoil and subsoil within garden areas, a validation trial pit excavation depth check will be undertaken at a frequency of 1 in 4 plots, so as to confirm the sufficient depth of the clean capping layer, along with observation of a hi-visibility geotextile membrane placed at the base of the capping soils.

An additional sample of topsoil and subsoil will also be taken from each trial pit excavated to further confirm the chemical quality of the topsoil and subsoil on an ongoing basis.

### **Validation of Clean Capping Layer to Plots 481 to 483 and 357**

An engineer from Intégral Géotechnique attended site on 4<sup>th</sup> April 2024 and observed hand/machine dug trial pit for validation purposes at 1No. trial pit within the above garden areas of plots 482. The topsoil resembled a cohesive dry silty clay strata and was underlain by a subsoil material found to be a granular material comprising a medium dense becoming dense orangish brown and brown very sandy clayey gravel with medium cobble content. The trial pit was found to exhibit the required total of a minimum 600mm of clean cover soil material placed in the garden areas along with observation of the hi-visibility geotextile membrane placed at the base of the capping soils.

Various photographs of capping depths and infilled constructed gardens are shown in Figures.

Representative samples of the 'as placed' topsoil and subsoil soil materials in the above trial pit excavated within the garden areas inspected have been further, sampled and sent to the accredited laboratories of i2 Analytical for chemical analysis. The soil analysis report is available and included within this report.

In-situ chemical soil test reports are attached in Appendix A.

The results of the topsoil and subsoil sampled from within plots 482 have been summarised and compared to the appropriate screening criteria for a residential end use. The results have been compared to appropriate Suitable 4 Use Levels (S4ULs) derived by LQM, in the first instance. In their absence, the results will have been compared to the Category 4 Screening Levels (C4SL) and the Soil Guideline Values (SGVs) and Soil Screening Values (SSVs) derived by Atkins ATRISKsoil for residential with the consumption of home grown produce end use, to assess the potential risk to human health.

Summary of the in-situ chemical testing results are attached in Appendix B.

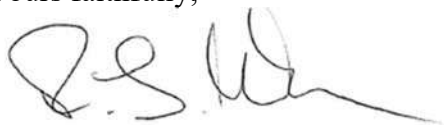
## **Conclusion**

This report based on the above information, therefore confirms that the final remediation works regarding the 600mm capping layer, hi-visibility geotextile membrane required for plots 481 to 482 and 357.

Provision of clean cover to the remaining plots at site and at the required inspection frequency will be provided in due course.

We trust that the above is to your satisfaction. However, if you have any queries or require any further information, please do not hesitate to contact us.

Yours faithfully,



**Roger J Hawkins**  
**For**  
**Intégral Géotechnique (Wales) Limited**

Figures.

## **APPENDIX A**

### **IN-SITU CHEMICAL SOIL TEST REPORTS**



Integral Geotechnique  
Integral House  
7 Beddau Way  
Castlegate Business Park  
CF83 2AX

i2 Analytical Ltd.  
7 Woodshots Meadow,  
Croxley Green  
Business Park,  
Watford,  
Herts,  
WD18 8YS

**t:** 02920807991

**e:** roger@integralgeotec.com

**t:** 01923 225404

**f:** 01923 237404

**e:** reception@i2analytical.com

## **Analytical Report Number : 24-012416**

|                             |                    |                                                        |            |
|-----------------------------|--------------------|--------------------------------------------------------|------------|
| <b>Project / Site name:</b> | Whiteheads Newport | <b>Samples received on:</b>                            | 05/04/2024 |
| <b>Your job number:</b>     | 14092 RJH          | <b>Samples instructed on/<br/>Analysis started on:</b> | 05/04/2024 |
| <b>Your order number:</b>   | 14092 RJH          | <b>Analysis completed by:</b>                          | 15/04/2024 |
| <b>Report Issue Number:</b> | 1                  | <b>Report issued on:</b>                               | 15/04/2024 |
| <b>Samples Analysed:</b>    | 2 soil samples     |                                                        |            |

**Signed:** \_\_\_\_\_

Anna Goc  
PL Head of Reporting Team  
**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting  
leachates - 2 weeks from reporting  
waters - 2 weeks from reporting  
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.  
Application of uncertainty of measurement would provide a range within which the true result lies.  
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-012416  
Project / Site name: Whiteheads Newport  
Your Order No: 14092 RJH

|                                         |       |                    |                      |                  |                  |
|-----------------------------------------|-------|--------------------|----------------------|------------------|------------------|
| Lab Sample Number                       |       |                    |                      | 162328           | 162329           |
| Sample Reference                        |       |                    |                      | Plot 482 Topsoil | Plot 482 Subsoil |
| Sample Number                           |       |                    |                      | None Supplied    | None Supplied    |
| Depth (m)                               |       |                    |                      | 0.10             | 0.50             |
| Date Sampled                            |       |                    |                      | 04/04/2024       | 04/04/2024       |
| Time Taken                              |       |                    |                      | 1210             | 1230             |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation Status |                  |                  |
|                                         |       |                    |                      |                  |                  |

|                               |    |      |      |       |       |
|-------------------------------|----|------|------|-------|-------|
| Stone Content                 | %  | 0.1  | NONE | < 0.1 | < 0.1 |
| Moisture Content              | %  | 0.01 | NONE | 17    | 17    |
| Total mass of sample received | kg | 0.1  | NONE | 0.4   | 0.4   |

#### Asbestos

|                                        |      |     |           |              |              |
|----------------------------------------|------|-----|-----------|--------------|--------------|
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected | Not-detected |
| Asbestos Analyst ID                    | N/A  | N/A | N/A       | WEM          | WEM          |

#### General Inorganics

|                                                                         |          |         |        |        |        |
|-------------------------------------------------------------------------|----------|---------|--------|--------|--------|
| pH (L099)                                                               | pH Units | N/A     | MCERTS | 8.1    | 7.8    |
| Total Cyanide                                                           | mg/kg    | 1       | MCERTS | < 1.0  | < 1.0  |
| Total Sulphate as SO <sub>4</sub>                                       | mg/kg    | 50      | MCERTS | 430    | 430    |
| Water Soluble Sulphate as SO <sub>4</sub> 16hr extraction (2:1)         | mg/kg    | 2.5     | MCERTS | 76     | 47     |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | g/l      | 0.00125 | MCERTS | 0.0381 | 0.0236 |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | mg/l     | 1.25    | MCERTS | 38.1   | 23.6   |
| Sulphide                                                                | mg/kg    | 1       | MCERTS | 1.6    | < 1.0  |
| Total Sulphur                                                           | mg/kg    | 50      | MCERTS | 310    | 250    |
| Total Organic Carbon (TOC) - Automated                                  | %        | 0.1     | MCERTS | 1.6    | 1.5    |
| Loss on Ignition @ 450°C                                                | %        | 0.2     | MCERTS | 3.7    | 3.6    |

#### Total Phenols

|                            |       |   |        |       |       |
|----------------------------|-------|---|--------|-------|-------|
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 |
|----------------------------|-------|---|--------|-------|-------|

#### Speciated PAHs

|                        |       |      |           |        |        |
|------------------------|-------|------|-----------|--------|--------|
| Naphthalene            | mg/kg | 0.05 | MCERTS    | < 0.05 | < 0.05 |
| Acenaphthylene         | mg/kg | 0.05 | MCERTS    | < 0.05 | < 0.05 |
| Acenaphthene           | mg/kg | 0.05 | MCERTS    | < 0.05 | < 0.05 |
| Fluorene               | mg/kg | 0.05 | MCERTS    | < 0.05 | < 0.05 |
| Phenanthrene           | mg/kg | 0.05 | MCERTS    | 0.05   | < 0.05 |
| Anthracene             | mg/kg | 0.05 | MCERTS    | < 0.05 | < 0.05 |
| Fluoranthene           | mg/kg | 0.05 | MCERTS    | 0.19   | 0.08   |
| Pyrene                 | mg/kg | 0.05 | MCERTS    | 0.16   | 0.06   |
| Benzo(a)anthracene     | mg/kg | 0.05 | MCERTS    | 0.16   | 0.06   |
| Chrysene               | mg/kg | 0.05 | MCERTS    | 0.18   | 0.08   |
| Benzo(b)fluoranthene   | mg/kg | 0.05 | ISO 17025 | 0.2    | 0.09   |
| Benzo(k)fluoranthene   | mg/kg | 0.05 | ISO 17025 | 0.11   | 0.06   |
| Benzo(a)pyrene         | mg/kg | 0.05 | MCERTS    | 0.17   | 0.06   |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS    | 0.1    | < 0.05 |
| Dibenz(a,h)anthracene  | mg/kg | 0.05 | MCERTS    | < 0.05 | < 0.05 |
| Benzo(ghi)perylene     | mg/kg | 0.05 | MCERTS    | 0.09   | < 0.05 |

#### Total PAH

|                             |       |     |           |      |        |
|-----------------------------|-------|-----|-----------|------|--------|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 1.41 | < 0.80 |
|-----------------------------|-------|-----|-----------|------|--------|

Analytical Report Number: 24-012416  
Project / Site name: Whiteheads Newport  
Your Order No: 14092 RJH

|                                         |       |                    |                      |                  |                  |
|-----------------------------------------|-------|--------------------|----------------------|------------------|------------------|
| Lab Sample Number                       |       |                    |                      | 162328           | 162329           |
| Sample Reference                        |       |                    |                      | Plot 482 Topsoil | Plot 482 Subsoil |
| Sample Number                           |       |                    |                      | None Supplied    | None Supplied    |
| Depth (m)                               |       |                    |                      | 0.10             | 0.50             |
| Date Sampled                            |       |                    |                      | 04/04/2024       | 04/04/2024       |
| Time Taken                              |       |                    |                      | 1210             | 1230             |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation Status |                  |                  |
|                                         |       |                    |                      |                  |                  |

#### Heavy Metals / Metalloids

|                                    |       |      |        |       |       |
|------------------------------------|-------|------|--------|-------|-------|
| Arsenic (aqua regia extractable)   | mg/kg | 1    | MCERTS | 16    | 17    |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.64  | 0.58  |
| Boron (water soluble)              | mg/kg | 0.2  | MCERTS | 1.5   | 0.9   |
| Cadmium (aqua regia extractable)   | mg/kg | 0.2  | MCERTS | 0.9   | 0.9   |
| Chromium (hexavalent)              | mg/kg | 1.8  | MCERTS | < 1.8 | < 1.8 |
| Chromium (aqua regia extractable)  | mg/kg | 1    | MCERTS | 21    | 17    |
| Copper (aqua regia extractable)    | mg/kg | 1    | MCERTS | 18    | 14    |
| Lead (aqua regia extractable)      | mg/kg | 1    | MCERTS | 41    | 36    |
| Mercury (aqua regia extractable)   | mg/kg | 0.3  | MCERTS | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable)    | mg/kg | 1    | MCERTS | 16    | 15    |
| Selenium (aqua regia extractable)  | mg/kg | 1    | MCERTS | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable)  | mg/kg | 1    | MCERTS | 30    | 27    |
| Zinc (aqua regia extractable)      | mg/kg | 1    | MCERTS | 140   | 96    |

#### Petroleum Hydrocarbons

|                                             |       |      |        |         |         |
|---------------------------------------------|-------|------|--------|---------|---------|
| TPHCWG - Aliphatic >C5 - C6 HS_1D_AL        | mg/kg | 0.02 | NONE   | < 0.020 | < 0.020 |
| TPHCWG - Aliphatic >C6 - C8 HS_1D_AL        | mg/kg | 0.02 | NONE   | < 0.020 | < 0.020 |
| TPHCWG - Aliphatic >C8 - C10 HS_1D_AL       | mg/kg | 0.05 | NONE   | < 0.050 | < 0.050 |
| TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL   | mg/kg | 1    | MCERTS | < 1.0   | < 1.0   |
| TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL   | mg/kg | 2    | MCERTS | < 2.0   | < 2.0   |
| TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL   | mg/kg | 8    | MCERTS | < 8.0   | < 8.0   |
| TPHCWG - Aliphatic >C16 - C35 EH_CU_1D_AL   | mg/kg | 10   | MCERTS | < 10    | < 10    |
| TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL   | mg/kg | 8    | MCERTS | < 8.0   | < 8.0   |
| TPHCWG - Aliphatic >C35 - C44 EH_CU_1D_AL   | mg/kg | 8.4  | NONE   | < 8.4   | < 8.4   |
| TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL | mg/kg | 10   | NONE   | < 10    | < 10    |
| TPHCWG - Aliphatic >C5 - C44 EH_CU+HS_1D_AL | mg/kg | 10   | NONE   | < 10    | < 10    |

|                                              |       |      |        |         |         |
|----------------------------------------------|-------|------|--------|---------|---------|
| TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR        | mg/kg | 0.01 | NONE   | < 0.010 | < 0.010 |
| TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR        | mg/kg | 0.01 | NONE   | < 0.010 | < 0.010 |
| TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR       | mg/kg | 0.05 | NONE   | < 0.050 | < 0.050 |
| TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR   | mg/kg | 1    | MCERTS | < 1.0   | < 1.0   |
| TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR   | mg/kg | 2    | MCERTS | < 2.0   | < 2.0   |
| TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR   | mg/kg | 10   | MCERTS | < 10    | < 10    |
| TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR   | mg/kg | 10   | MCERTS | < 10    | < 10    |
| TPHCWG - Aromatic >EC35 - EC40 EH_CU_1D_AR   | mg/kg | 10   | NONE   | < 10    | < 10    |
| TPHCWG - Aromatic >EC35 - EC44 EH_CU_1D_AR   | mg/kg | 8.4  | NONE   | < 8.4   | < 8.4   |
| TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR | mg/kg | 10   | NONE   | < 10    | < 10    |
| TPHCWG - Aromatic >EC5 - EC44 EH_CU+HS_1D_AR | mg/kg | 10   | NONE   | < 10    | < 10    |

|                                       |       |    |      |      |      |
|---------------------------------------|-------|----|------|------|------|
| TPH Total >C5 - C44 EH_CU+HS_1D_TOTAL | mg/kg | 10 | NONE | < 10 | < 10 |
|---------------------------------------|-------|----|------|------|------|

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

**Analytical Report Number : 24-012416**

**Project / Site name: Whiteheads Newport**

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description *                           |
|-------------------|------------------|---------------|-----------|------------------------------------------------|
| 162328            | Plot 482 Topsoil | None Supplied | 0.1       | Brown loam and clay with gravel and vegetation |
| 162329            | Plot 482 Subsoil | None Supplied | 0.5       | Brown loam and clay with gravel and vegetation |

**Analytical Report Number : 24-012416**  
**Project / Site name: Whiteheads Newport**

**Water matrix abbreviations:**

**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name                                                        | Analytical Method Description                                                                                                                                         | Analytical Method Reference                                                                            | Method number | Wet / Dry Analysis | Accreditation Status |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| Asbestos identification in Soil                                             | Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques                                                 | In-house method based on HSG 248, 2021                                                                 | A001B         | D                  | ISO 17025            |
| Total organic carbon (Automated) in soil                                    | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)                   | In-house method                                                                                        | L009B         | D                  | MCERTS               |
| Sulphide in soil                                                            | Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode | In-house method                                                                                        | L010          | D                  | MCERTS               |
| Moisture Content                                                            | Moisture content, determined gravimetrically (up to 30°C)                                                                                                             | In-house method                                                                                        | L019B         | W                  | NONE                 |
| Stones content of soil                                                      | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight                                            | In-house method based on British Standard Methods and MCERTS requirements.                             | L019B         | D                  | NONE                 |
| Metals in soil by ICP-OES                                                   | Determination of metals in soil by aqua-regia digestion followed by ICP-OES                                                                                           | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil                    | L038B         | D                  | MCERTS               |
| Boron, water soluble, in soil                                               | Determination of water soluble boron in soil by hot water extract followed by ICP-OES                                                                                 | In-house method based on Second Site Properties version 3                                              | L038B         | D                  | MCERTS               |
| Total sulphate (as SO <sub>4</sub> in soil)                                 | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES                                                                                | In-house method                                                                                        | L038B         | D                  | MCERTS               |
| Sulphate, water soluble, in soil (16hr extraction)                          | Sulphate, water soluble, in soil (16hr extraction)                                                                                                                    | In-house method                                                                                        | L038B         | D                  | MCERTS               |
| Total Sulphur in soil                                                       | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES                                                   | In-house method                                                                                        | L038B         | D                  | MCERTS               |
| Loss on ignition of soil @ 450°C                                            | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace                                                        | In-house method                                                                                        | L047          | D                  | MCERTS               |
| Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil        | Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS                                | In-house method based on USEPA 8270                                                                    | L064B         | D                  | MCERTS               |
| Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil | Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic                                                   | In-house method                                                                                        | L076B/L088    | D/W                | MCERTS               |
| Hexavalent chromium in soil                                                 | Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry                                      | In-house method                                                                                        | L080          | W                  | MCERTS               |
| Monohydric phenols in soil                                                  | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry                                                 | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L080          | W                  | MCERTS               |
| Total cyanide in soil                                                       | Determination of total cyanide by distillation followed by colorimetry                                                                                                | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L080          | W                  | MCERTS               |

**Analytical Report Number : 24-012416**  
**Project / Site name: Whiteheads Newport**

**Water matrix abbreviations:**

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

| Analytical Test Name   | Analytical Method Description                                                                    | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|------------------------|--------------------------------------------------------------------------------------------------|-----------------------------|---------------|--------------------|----------------------|
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement | In-house method             | L099          | D                  | MCERTS               |

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

| Acronym | Descriptions                                                           |
|---------|------------------------------------------------------------------------|
| HS      | Headspace Analysis                                                     |
| MS      | Mass spectrometry                                                      |
| FID     | Flame Ionisation Detector                                              |
| GC      | Gas Chromatography                                                     |
| EH      | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) |
| CU      | Clean-up - e.g. by Florisil®, silica gel                               |
| 1D      | GC - Single coil/column gas chromatography                             |
| 2D      | GC-GC - Double coil/column gas chromatography                          |
| Total   | Aliphatics & Aromatics                                                 |
| AL      | Aliphatics                                                             |
| AR      | Aromatics                                                              |
| #1      | EH_2D_Total but with humics mathematically subtracted                  |
| #2      | EH_2D_Total but with fatty acids mathematically subtracted             |
| _       | Operator - understore to separate acronyms (exception for +)           |
| +       | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total     |

## **APPENDIX B**

### **IN-SITU SUMMARY OF CHEMICAL TEST RESULTS**

## SUMMARY OF LABORATORY SOIL TEST RESULTS

### METALS AND SEMI-METALS

Job No.: 14092  
 Site: Whiteheads Newport  
 Soil Type: Capping Soils  
 Soil Organic Matter: 1%

| No.                                | Location         | Depth (m) | Arsenic<br>(mg/kg) | Boron<br>(mg/kg) | Beryllium<br>(mg/kg) | Cadmium<br>(mg/kg) | Chromium<br>(mg/kg) | Chromium (VI)<br>(mg/kg) | Copper<br>(mg/kg) | Lead<br>(mg/kg) | Mercury<br>(Elemental)<br>(mg/kg) | Nickel<br>(mg/kg) | Selenium<br>(mg/kg) | Vanadium<br>(mg/kg) | Zinc<br>(mg/kg) |
|------------------------------------|------------------|-----------|--------------------|------------------|----------------------|--------------------|---------------------|--------------------------|-------------------|-----------------|-----------------------------------|-------------------|---------------------|---------------------|-----------------|
| 13                                 | Plot 482 Topsoil | 0.10      | 16                 | 1.5              | 0.64                 | 0.9                | 21                  | < 1.8                    | 18                | 41              | < 0.3                             | 16                | < 1.0               | 30                  | 140             |
| 14                                 | Plot 482 Subsoil | 0.50      | 17                 | 0.9              | 0.58                 | 0.9                | 17                  | < 1.8                    | 14                | 36              | < 0.3                             | 15                | < 1.0               | 27                  | 96              |
| Screening Criteria Value           |                  |           | 37.0               | 290.0            | 1.7                  | 11.0               | -                   | 6.0                      | 2400.0            | 168.0           | 1.2                               | 130.0             | 250.0               | 410.0               | 3700.0          |
| Source of Screening Criteria Value |                  |           | S4UL               | S4UL             | S4UL                 | S4UL               | -                   | S4UL                     | S4UL              | GAC             | S4UL                              | S4UL              | S4UL                | S4UL                | S4UL            |

**SUMMARY OF LABORATORY SOIL TEST RESULTS**  
**INORGANIC CHEMICALS & OTHERS**

Job No.: 14092  
 Site: Whiteheads Newport  
 Soil Type: Capping Soils  
 Soil Organic Matter: 1%

| No.                                | Location         | Depth (m) | Cyanide<br>(mg/kg) | Loss on Ignition,<br>dried solids<br>(%) | Moisture content<br>at 30 C<br>(%) | Phenol<br>(mg/kg) | pH<br>(pH units) | Water Soluble<br>Sulphate<br>(g/l) | Sulphate Total<br>as SO4<br>(mg/kg) | Sulphide<br>(mg/kg) | Total Sulphur<br>(mg/kg) | TOC by Ignition<br>in O2<br>(%) | Equivalent SOM<br>(%) | Asbestos in<br>Soil | Asbestos<br>Quantification<br>(%) |
|------------------------------------|------------------|-----------|--------------------|------------------------------------------|------------------------------------|-------------------|------------------|------------------------------------|-------------------------------------|---------------------|--------------------------|---------------------------------|-----------------------|---------------------|-----------------------------------|
| 13                                 | Plot 482 Topsoil | 0.10      | < 1.0              | 3.70                                     | 17.00                              | < 1.0             | 8.10             | 0.038                              | 430.00                              | 1.60                | 310.00                   | 1.60                            | 2.75                  | Not-detected        | #N/A                              |
| 14                                 | Plot 482 Subsoil | 0.50      | < 1.0              | 3.60                                     | 17.00                              | < 1.0             | 7.80             | 0.024                              | 430.00                              | < 1.0               | 250.00                   | 1.50                            | 2.58                  | Not-detected        | #N/A                              |
| Screening Criteria Value           |                  |           | 34.0               | -                                        | -                                  | 120.0             | -                | -                                  | -                                   | -                   | -                        | -                               | -                     | -                   | 0.001                             |
| Source of Screening Criteria Value |                  |           | ATRISK             | -                                        | -                                  | S4UL              | -                | -                                  | -                                   | -                   | -                        | -                               | -                     | -                   | IOM                               |

**SUMMARY OF LABORATORY SOIL TEST RESULTS**  
**POLYAROMATIC HYDROCARBONS (PAH)**

Job No.: 14092  
Site: Whiteheads Newport  
Soil Type: Capping Soils  
Soil Organic Matter: 1%

| No.                                | Location         | Depth (m) | Acenaphthene<br>(mg/kg) | Acenaphthylene<br>(mg/kg) | Anthracene<br>(mg/kg) | Benzo(a)anthra-<br>cene<br>(mg/kg) | Benzo(a)pyrene<br>(mg/kg) | Benzo(b)fluoran-<br>thene<br>(mg/kg) | Benzo(ghi)peryl-<br>ene<br>(mg/kg) | Benzo(k)fluoran-<br>thene<br>(mg/kg) | Chrysene<br>(mg/kg) | Dibenzo(ah)anth-<br>racene<br>(mg/kg) | Fluoranthene<br>(mg/kg) | Fluorene<br>(mg/kg) | Indeno(123cd)p-<br>yrene<br>(mg/kg) | Naphthalene<br>(mg/kg) | Phenanthrene<br>(mg/kg) | Pyrene<br>(mg/kg) |
|------------------------------------|------------------|-----------|-------------------------|---------------------------|-----------------------|------------------------------------|---------------------------|--------------------------------------|------------------------------------|--------------------------------------|---------------------|---------------------------------------|-------------------------|---------------------|-------------------------------------|------------------------|-------------------------|-------------------|
| 13                                 | Plot 482 Topsoil | 0.10      | < 0.05                  | < 0.05                    | < 0.05                | 0.16                               | 0.17                      | 0.2                                  | 0.09                               | 0.11                                 | 0.18                | < 0.05                                | 0.19                    | < 0.05              | 0.1                                 | < 0.05                 | 0.05                    | 0.16              |
| 14                                 | Plot 482 Subsoil | 0.50      | < 0.05                  | < 0.05                    | < 0.05                | 0.06                               | 0.06                      | 0.09                                 | < 0.05                             | 0.06                                 | 0.08                | < 0.05                                | 0.08                    | < 0.05              | < 0.05                              | < 0.05                 | < 0.05                  | 0.06              |
| Screening Criteria Value           |                  |           | 210.0                   | 170.0                     | 2400.0                | 7.2                                | 2.2                       | 2.6                                  | 320.0                              | 77.0                                 | 15.0                | 0.24                                  | 280.0                   | 170.0               | 27.0                                | 2.3                    | 95.0                    | 620.0             |
| Source of Screening Criteria Value |                  |           | S4UL                    | S4UL                      | S4UL                  | S4UL                               | S4UL                      | S4UL                                 | S4UL                               | S4UL                                 | S4UL                | S4UL                                  | S4UL                    | S4UL                | S4UL                                | S4UL                   | S4UL                    | S4UL              |

**SUMMARY OF LABORATORY SOIL TEST RESULTS**  
**PETROLEUM HYDROCARBONS**

Job No.: 14092  
 Site: Whiteheads Newport  
 Soil Type: Capping Soils  
 Soil Organic Matter: 1%

| No.                                | Location         | Depth (m) | Aliphatic C5-C6<br>(mg/kg) | Aliphatic C6-C8<br>(mg/kg) | Aliphatic C8-C10<br>(mg/kg) | Aliphatic C10-<br>C12 EPH<br>(mg/kg) | Aliphatic C12-<br>C16 EPH<br>(mg/kg) | Aliphatic C16-C35<br>EPH<br>(mg/kg) | Aliphatic C35-<br>C44 EPH<br>(mg/kg) | Aromatic C5-C7<br>(mg/kg) | Aromatic C7-C8<br>(mg/kg) | Aromatic C8-C10<br>(mg/kg) | Aromatic C10-<br>C12 EPH<br>(mg/kg) | Aromatic C12-<br>C16 EPH<br>(mg/kg) | Aromatic C16-<br>C21 EPH<br>(mg/kg) | Aromatic C21-<br>C35 EPH<br>(mg/kg) | Aromatic C35-<br>C40 EPH<br>(mg/kg) |
|------------------------------------|------------------|-----------|----------------------------|----------------------------|-----------------------------|--------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|---------------------------|---------------------------|----------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 13                                 | Plot 482 Topsoil | 0.10      | < 0.020                    | < 0.020                    | < 0.050                     | < 1.0                                | < 2.0                                | < 8.0                               | < 8.4                                | < 0.010                   | < 0.010                   | < 0.050                    | < 1.0                               | < 2.0                               | < 10                                | < 10                                | < 10                                |
| 14                                 | Plot 482 Subsoil | 0.50      | < 0.020                    | < 0.020                    | < 0.050                     | < 1.0                                | < 2.0                                | < 8.0                               | < 8.4                                | < 0.010                   | < 0.010                   | < 0.050                    | < 1.0                               | < 2.0                               | < 10                                | < 10                                | < 10                                |
| Screening Criteria Value           |                  |           | 42.0                       | 100.0                      | 27.0                        | 130.0                                | 1100.0                               | 65000.0                             | 65000.0                              | 0.1                       | 130.0                     | 34.0                       | 74.0                                | 140.0                               | 260.0                               | 1100.0                              | 1100.0                              |
| Source of Screening Criteria Value |                  |           | S4UL                       | S4UL                       | S4UL                        | S4UL                                 | S4UL                                 | S4UL                                | S4UL                                 | S4UL                      | S4UL                      | S4UL                       | S4UL                                | S4UL                                | S4UL                                | S4UL                                | S4UL                                |

## FIGURES



Plot 482 Capping Depth Check



Plot 482 Trial Pit Excavation

**14092: Remedial Capping Works to Gardens and Landscape Areas**

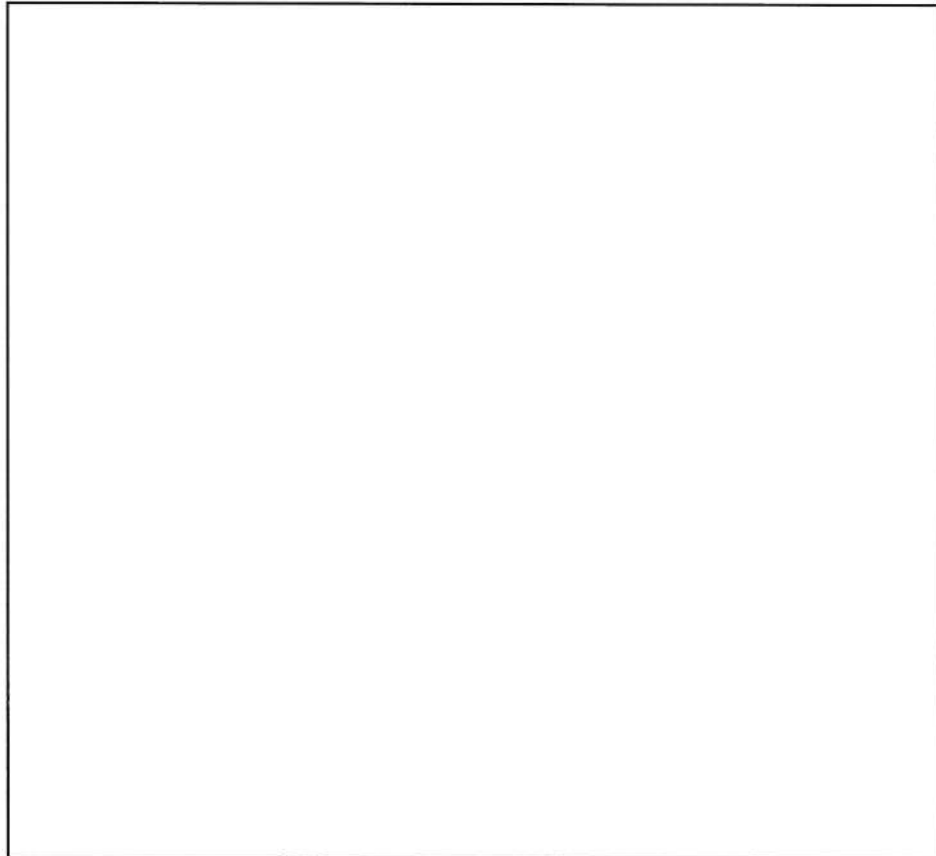
**Former Whiteheads Steelworks, Mendalgief Road, Newport.**

**Intégral**  
Géotechnique

Integral House  
Castlegate Business Park  
Caerphilly  
CF83 2AX  
Tel: 029 20807991  
Fax: 029 20862176



Plot 482 Membrane Placement (Membrane hand touched through Water Ingress)



Left Blank

**14092: Remedial Capping Works to Gardens and  
Landscape Areas**

**Former Whiteheads Steelworks, Mendalgief Road,  
Newport.**

**Intégral**  
Géotechnique

Integral House  
Castlegate Business Park  
Caerphilly  
CF83 2AX  
Tel: 029 20807991  
Fax: 029 20862176