# APPENDIX 15

SITE SPECIFIC
RISK BASED CORRECTIVE ASSESSMENT (RBCA) MODEL FOR CHEMICAL RELEASES VERSION 2.6

PEER REVIEW OF GAS AND VAPOUR RISK TO HOUSES, AND GROUNDWATER AT
BARNAGEERAGH DEVELOPMENT,
TOM PARKER, ARGENTUM FOX,
30TH JANUARY 2019

# SITE SPECIFIC
# RISK BASED CORRECTIVE ASSESSMENT (RBCA) MODEL
# FOR CHEMICAL RELEASES VERSION 2.6

# Main Screen

RBCA Tool Kit for Chemical Releases
Version 2.6 

## 1. Project Information

| | | | |
|---|---|---|---|
| Site Name: | Barnageeragh Landfill | | |
| Location: | Skerries, Co. Dublin | | |
| Completed By: | P.McCabe | | |
| Date: | 29.08.18 | Job ID: | |

## 2. Which Type of RBCA Analysis?

?

○ **Tier 1** — Risk-Based Screening Levels

◉ **Tier 2/3** — Site-Specific Target Levels

## 3. Calculation Options

?

*Affects which input data are required*

☑ ***Baseline Risks (Forward mode)***

☑ ***RBCA Cleanup Levels (Backward mode)***

○ Individual Constituent Risk Goals Only
◉ Individual and Cumulative Risk Goals

☐ Apply Source Depletion Algorithm

Time to Future Exposure: 0 *(yr)*

## 4. RBCA Evaluation Process

### *Prepare Input Data*

Data Complete? ( ■ = yes, ■ = no)

- Exposure Pathways
- ↓
- Constituents of Concern (COCs)
- ↓
- Transport Models
- ↓
- Soil Parameters
- ↓
- GW Parameters
- ↓
- Air Parameters

### *Review Output*

- Exposure Flowchart
- COC Chem. Parameters
- Input Data Summary
- User-Spec. COC Data...
- Transient Domenico Analysis...
- Baseline Risks...
- Cleanup Levels...

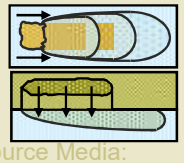
## 5. Commands and Options

New Site | Load Data... | Save Data As... | User Chemical Database
Set Units | Print Sheet | Print Report
*Help* | Quit

# Exposure Pathway Identification

Site Name: Barnageeragh Landfill
Location: Skerries, Co. Dublin
Compl. By: P.McCabe
Job ID: Date: 29.08.18

## 1. Groundwater Exposure



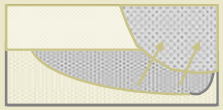
**Groundwater Ingestion/ Surface Water Impact**

| Receptor: | None | None | None |
|---|---|---|---|
| | On-site | Off-site1 | Off-site2 |
| Distance: | 0 | 0 | 0 (m) |

Source Media:
- ☐ Affected Groundwater
- ☐ Affected Soils Leaching to Groundwater

Option:
- ☐ Apply MCL value as ingestion RBEL (backward mode only)

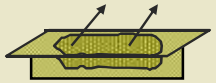
**GW Discharge to Surface Water Exposure**



- ☐ Swimming
- ☐ Fish Consumption
- ☐ Specified Water Quality Criteria

Enter Criteria

## 2. Surface Soil Exposure



**Combined Exposure**

Receptor: Res. | On-site

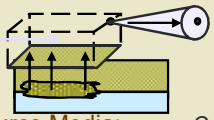
Construction Worker ☑

Source Media:
- ☐ Direct Ingestion
- ☐ Dermal Contact
- ☑ Inhalation (vol+part)
- ☐ Vegetable Ingestion

Veg Options

Option:
- ☑ Apply UK (CLEA) SGV as soil concentration limit

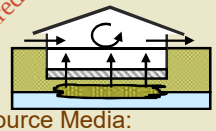
## 3. Air Exposure



**Volatilization and Particulates to Outdoor Air Inhalation**

| Receptor: | Res. | Res. | None |
|---|---|---|---|
| | On-site | Off-site1 | Off-site2 |
| Distance: | 0 | 5 | 0 (m) |

Source Media:
- Construction worker ☐
- ☑ Affected Soils--Volatilization to Ambient Outdoor Air
- ☐ Affected Groundwater--Volatilization to Ambient Outdoor Air
- ☑ Affected Surface Soils--Particulates to Ambient Outdoor Air



**Volatilization to Indoor Air Inhalation**

| Receptor: | Res. | Res. | None |
|---|---|---|---|
| | On-site | Off-site1 | Off-site2 |
| Distance: | 0 | 5 | 0 (m) |

Source Media:
- ☑ Affected Soils--Volatilization to Enclosed Space
- ☑ Affected Soils Leaching to GW--Volatilization to Enclosed Space
- ☐ Affected Groundwater--Volatilization to Enclosed Space

Bldg Options

## 4. Commands and Options

Main Screen | Print Sheet | Set Units | Help

Exposure Factors & Target Risks | Exposure Flowchart

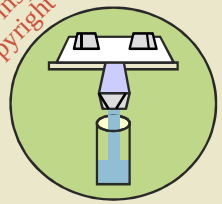
# Exposure Factors and Target Risk Limits

Site Name: Barnageeragh Landfill
Location: Skerries, Co. Dublin
Compl. By: P.McCabe
Job ID: Date: 29.08.18

## 1. Exposure Parameters

| | Residential Receptors | | | Commerical Receptors | | User Defined |
|---|---|---|---|---|---|---|
| | Child | Adolescent | Adult | Adult | Construc. | |
| Averaging time, carcinogens (yr) | 70 | | | | | - |
| Averaging time, non-carcinogens (yr) | 6 | 12 | 30 | 25 | 1 | - |
| Body weight (kg) | 15 | 35 | 70 | 70 | 70 | - |
| Exposure duration (yr) | 6 | 12 | 30 | 25 | 1 | - |
| Averaging Time for Vapor Flux (yr) | 30 | | | 30 | 30 | - |
| Exposure frequency (d/yr) | 350 | | | 250 | 180 | - |
| Dermal exposure freq. (d/yr) | 350 | | | 250 | 180 | - |
| Seasonal-avg skin surface area ($cm^2$/d) | 2023 | 2023 | 3160 | 3160 | 3160 | - |
| Soil dermal adherence factor ($mg/cm^2$) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | - |
| Water ingestion rate (L/d) | 1 | 1 | 2 | 1 | 1 | - |
| Soil ingestion rate (mg/d) | 200 | 200 | 100 | 50 | 100 | - |
| Swimming exposure time (hr/event) | 1 | 3 | 3 | | | |
| Swimming event frequency (events/yr) | 12 | 12 | 12 | | | |
| Swimming water ingestion rate (L/hr) | 0.5 | 0.5 | 0.05 | | | |
| Skin surface area, swimming ($cm^2$) | 3500 | 8100 | 23000 | | | |
| Fish consumption rate (kg/d) | 0.025 | 0.025 | 0.025 | | | |
| Vegetable ingestion rate (kg/d) | | | | | | |
| Above-ground vegetables | 0.002 | 0.002 | 0.006 | | | |
| Below-ground vegetables | 0.001 | 0.001 | 0.002 | | | |
| Contaminated fish fraction (-) | 1 | | | | | |





## 2. Age Adjustment for Carcinogens

*(residential receptor only)*

| | Adjustment Factor | |
|---|---|---|
| ☑ Seasonal skin surface area, soil contact | 1022.26 | ($cm^2$-yr/kg) |
| ☑ Water ingestion | 1.08571 | (mg-yr/L-day) |
| ☑ Soil ingestion | 165.714 | (mg-yr/kg-day) |
| ☑ Swimming water ingestion | 4.56 | (L/kg) |
| ☑ Skin surface area, swimming | 80640 | ($cm^2$-yr/kg) |
| ☑ Fish consumption | 0.02286 | (kg-yr/kg-day) |
| ☑ Below-ground vegetable ingestion | 0.38 | (kg-yr/kg-day) |
| ☑ Above-ground vegetable ingestion | 0.88 | (kg-yr/kg-day) |

## 3. Non-Carcinogenic Receptor

*(residential receptor only)*

Child

## 4. Target Health Risk Limits

| | Individual | Cumulative |
|---|---|---|
| Target Cancer Risk (Carcinogens) | 1.0E-5 | 1.0E-5 |
| Target Hazard Quotient/Index (non-Carc.) | 1.0E+0 | 1.0E+0 |

## 5. Commands and Options

Return to Exposure Pathways

Use/Set Default Values

Print Sheet

Help

Site Name: Barnageeragh Landfill | Job ID:
Location: Skerries, Co. Dublin | Date: 29.08.18
Compl. By: P.McCabe

**Commands and Options**

Main Screen | Print Sheet | Help

# Source Media Constituents of Concern (COCs)

Apply Raoult's Law ?

## Selected COCs ?

COC Select: Add/Insert, Delete
Sort List: Top, Bottom, MoveUp, MoveDown

## Representative COC Concentration ?

| Selected COCs | Groundwater Source Zone (mg/L) | Groundwater note | Soil Source Zone (mg/kg) | Soil note | Mole Fraction in Source Material (-) |
|---|---|---|---|---|---|
| Arsenic | 2.1E-3 | | 2.9E+1 | | |
| Mercury | 8.0E-4 | | 3.4E-1 | | |
| Zinc | 9.6E-3 | | 7.0E+2 | | |
| Lead (inorganic) | 1.0E-3 | | 3.9E+2 | | |
| TPH - Aliph >C21-C34 | 1.0E-4 | | 1.5E+2 | | |
| TPH - Arom >C21-C35 | 1.0E-4 | | 1.4E+2 | | |
| Vinyl chloride | 1.0E-3 | | 1.1E-3 | | |
| Dichloroethylene, cis-1,2- | 1.0E-3 | | 1.7E-3 | | |

Groundwater Source Zone: Calculate | Enter Site Data
Soil Source Zone: Calculate | Enter Site Data

View Chemical Parameters

## Commands and Options

Return | Print Sheet | Help

Site Name: Barnageeragh Landfill — Job ID:
Location: Skerries, Co. Dublin — Date: 29.08.18
Compl. By: P.McCabe

# Groundwater Source Zone Concentration Calculator

Mean Option: Arithmetic
UCL Percentile: 95%
Paste Defaults
Select Representative Set

| Constituent | Detection Limit (mg/L) | No. of Samples | No. of Detects | Estimated Distribution of Data | Max. Conc. (mg/L) | Mean Conc. (mg/L) | UCL on Mean (mg/L) |
|---|---|---|---|---|---|---|---|
| Arsenic | #N/A | 35 | 35 | Normal | 8.9E-3 | 2.1E-3 | 2.6E-3 |
| Mercury | #N/A | 35 | 35 | Lognormal | 7.3E-3 | 8.0E-4 | 1.1E-3 |
| Zinc | #N/A | 35 | 35 | Lognormal | 6.4E-2 | 9.6E-3 | 1.4E-2 |
| Lead (inorganic) | #N/A | 35 | 35 | Normal | 1.0E-3 | 1.0E-3 | 1.0E-3 |
| TPH - Aliph >C21-C34 | #N/A | 35 | 35 | Normal | 1.0E-4 | 1.0E-4 | 1.0E-4 |
| TPH - Arom >C21-C35 | #N/A | 35 | 35 | Normal | 1.0E-4 | 1.0E-4 | 1.0E-4 |
| Vinyl chloride | 1.0E-3 | 35 | 35 | Normal | 1.0E-3 | 1.0E-3 | 1.0E-3 |
| Dichloroethylene, cis-1,2- | 1.0E-3 | 35 | 35 | Normal | 1.0E-3 | 1.0E-3 | 1.0E-3 |

* = Chemical with user-specified data



*Use scrollbar below to scroll right*

ect Representative Set

**Enter Analytical Data from Groundwater Source Zone (up to 50 Data Points)**

Analytical Da

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ID | June 2017) | 3H1 (Nov. 2017 | H1 (May.2018 | June 2017) | 3H2 (Nov. 2017 | H2 (May.201 | une 2017) | H3 (Nov. 201 | H3 (May.201 | une 2017) | H4 (Nov. 201 | H4 (May.201 |
| Date | | | | | | | | | | | | |
| | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* |
| | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 1.00E-3 | 1.00E-3 | 4.10E-3 | 1.30E-3 | 1.00E-3 | 8.90E-3 | 6.30E-3 | 3.50E-3 |
| | 2.20E-3 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 7.30E-3 | 5.00E-4 | 5.00E-4 | 6.50E-4 | 5.00E-4 | 5.00E-4 |
| | 5.40E-2 | 5.90E-2 | 6.40E-2 | 6.40E-3 | 2.30E-3 | 4.60E-3 | 1.30E-2 | 8.00E-3 | 1.40E-2 | 6.20E-3 | 2.80E-3 | 6.80E-3 |
| | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |
| | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 |
| | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 |
| | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |
| | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |

**Nonnumeric entries will be calculated as 1/2 Detection Limit (see second column)**

ta Analytical Da

| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| gust 2017) | H8 (Nov. 201 | H8 (May.201 | gust 2017) | H9 (Nov. 201 | H9 (May.201 | ugust 2017) | I10 (Nov. 20 | I10 (May.201 | ugust 2017) | I11 (Nov. 20 | I11 (May.201 | ugust 2017) |
| | | | | | | | | | | | | |
| *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* |
| 1.70E-3 | 2.50E-3 | 1.00E-3 | 1.60E-3 | 4.10E-3 | 3.10E-3 | 2.30E-3 | 3.20E-3 | 1.60E-3 | 1.80E-3 | 1.80E-3 | 1.40E-3 | 1.90E-3 |
| 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 7.10E-4 | 1.10E-3 | 5.00E-4 | 8.90E-4 | 7.30E-4 | 8.30E-4 | 5.10E-4 |
| 4.50E-3 | 1.00E-3 | 4.60E-3 | 2.90E-3 | 5.80E-3 | 4.20E-3 | 5.10E-3 | 1.00E-3 | 2.50E-3 | 8.60E-3 | 6.00E-3 | 1.00E-2 | 8.10E-3 |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |
| 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 |
| 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |

ta

Analytical Data

| 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H12 (Nov. 201 | H12 (May.201 | ugust 2017) | H13 (Nov. 201 | H13 (May.201 | H14 (Nov. 201 | H14 (May.201 | H15 (May.20 | H16 (May.201 | H17 (May.2018) | | | |
| | | | | | | | | | | | | |
| *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* |
| 1.40E-3 | 1.00E-3 | 2.00E-3 | 2.30E-3 | 1.00E-3 | 3.60E-3 | 1.60E-3 | 2.40E-3 | 1.60E-3 | 1.00E-3 | | | |
| 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | 5.00E-4 | | | |
| 1.00E-3 | 7.40E-3 | 1.60E-3 | 1.00E-3 | 2.10E-3 | 1.00E-3 | 6.10E-3 | 1.50E-3 | 4.90E-3 | 2.50E-3 | | | |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | | | |
| 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | | | |
| 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | 1.00E-4 | | | |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | | | |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | | | |

| 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* | *(mg/L)* |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

## Commands and Options

Return | Print Sheet | Help

Site Name: Barnageeragh Landfill | Job ID:
Location: Skerries, Co. Dublin | Date: 29.08.18
Compl. By: P.McCabe

# Soil Source Zone Concentration Calculator

Mean Option: Arithmetic | UCL Percentile: 95%

Paste Defaults | Select Representative Set

| Constituent | Detection Limit (mg/kg) | No. of Samples | No. of Detects | Estimated Distribution of Data | Max. Conc. (mg/kg) | Mean Conc. (mg/kg) | UCL on Mean (mg/kg) |
|---|---|---|---|---|---|---|---|
| Arsenic | 2.0E+0 | 39 | 39 | Normal | 6.1E+1 | 2.6E+1 | 2.9E+1 |
| Mercury | 1.0E-1 | 39 | 39 | Normal | 8.0E-1 | 2.9E-1 | 3.4E-1 |
| Zinc | 2.0E+0 | 39 | 39 | Lognormal | 3.6E+3 | 5.3E+2 | 7.0E+2 |
| Lead (inorganic) | 2.0E+0 | 39 | 39 | Lognormal | 1.7E+3 | 2.9E+2 | 3.9E+2 |
| TPH - Aliph >C21-C34 | 1.0E+0 | 39 | 39 | Lognormal | 8.1E+2 | 9.8E+1 | 1.5E+2 |
| TPH - Arom >C21-C35 | 1.0E+0 | 39 | 39 | Lognormal | 1.2E+3 | 8.0E+1 | 1.4E+2 |
| Vinyl chloride | 1.0E-3 | 39 | 39 | Normal | 2.1E-3 | 1.0E-3 | 1.1E-3 |
| Dichloroethylene, cis-1,2- | 1.0E-3 | 39 | 39 | Lognormal | 1.1E-2 | 1.3E-3 | 1.7E-3 |

* = Chemical with user-specified data



*Use scrollbar below to scroll right*

**Enter Analytical Data from**
**Soil Source Zone**
**(up to 50 Data Points)**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ID | SO-TP1-01 | SO-TP1-02 | SO-TP2-01 | SO-TP3-01 | SO-TP4-01 | SO-TP5-01 | SO-TP6-01 | SO-TP7-01 | SO-TP8-01 | SO-TP9-01 | SO-TP10-01 |
| Date | | | | | | | | | | | |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* |
| | 1.90E+1 | 1.60E+1 | 2.10E+1 | 3.50E+1 | 5.90E+1 | 2.40E+1 | 3.10E+1 | 3.00E+1 | 2.30E+1 | 2.40E+1 | 6.10E+1 |
| | 1.70E-1 | 1.00E-1 | 2.00E-1 | 3.30E-1 | 8.00E-1 | 1.60E-1 | 4.10E-1 | 4.20E-1 | 7.60E-1 | 7.30E-1 | 4.80E-1 |
| | 2.10E+2 | 7.20E+1 | 6.90E+2 | 9.40E+2 | 1.10E+3 | 6.50E+2 | 7.30E+2 | 5.60E+2 | 5.40E+2 | 5.70E+2 | 1.30E+3 |
| | 1.10E+2 | 3.20E+1 | 1.30E+2 | 6.40E+2 | 7.40E+2 | 1.10E+3 | 3.80E+2 | 3.10E+2 | 2.60E+2 | 2.60E+2 | 9.80E+2 |
| | 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.00E+0 | 4.10E+2 | 8.10E+2 | 1.00E+0 | 1.00E+0 |
| | 3.80E+1 | 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.20E+2 | 1.20E+3 | 1.00E+0 | 1.00E+0 |
| | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |
| | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |

**Nonnumeric entries will be calculated as 1/2 Detection Limit (see second column)**

Analytical Data

| 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SO-TP11-01 | SO-TP12-01 | SO-TP12-02 | SO-TP13-01 | SO- TP14-01 | SO- TP14-02 | SO- TP15-01 | SO- TP15-02 | SO- TP16-01 | SO-TP17-01 | SO-TP18-01 | SO-TP19-01 |
| | | | | | | | | | | | |
| *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* |
| 4.60E+1 | 2.40E+1 | 3.30E+1 | 2.30E+1 | 1.90E+1 | 2.50E+1 | 2.20E+1 | 1.50E+1 | 2.30E+1 | 1.80E+1 | 1.60E+1 | 2.70E+1 |
| 3.60E-1 | 1.70E-1 | 2.40E-1 | 2.80E-1 | 1.90E-1 | 3.20E-1 | 3.50E-1 | 1.20E-1 | 4.20E-1 | 1.50E-1 | 3.30E-1 | 1.30E-1 |
| 1.50E+3 | 9.70E+1 | 7.70E+2 | 3.40E+2 | 2.00E+2 | 3.20E+2 | 2.10E+2 | 1.10E+2 | 4.20E+2 | 2.60E+2 | 2.20E+2 | 7.50E+2 |
| 1.70E+3 | 4.00E+1 | 3.90E+2 | 1.40E+2 | 8.10E+1 | 2.60E+2 | 1.70E+2 | 4.60E+1 | 1.50E+2 | 1.00E+2 | 9.70E+1 | 1.80E+2 |
| 1.00E+0 | 1.00E+0 | 1.00E+0 | 2.70E+2 | 1.00E+0 | 8.10E+2 | 4.30E+2 | 1.00E+0 | 1.00E+0 | 8.80E+1 | 8.40E+1 | 1.00E+0 |
| 1.00E+0 | 1.00E+0 | 1.00E+0 | 3.70E+2 | 1.00E+0 | 2.20E+2 | 3.80E+2 | 1.00E+0 | 1.00E+0 | 1.70E+2 | 9.00E+1 | 1.00E+0 |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |

Analytical Data

| 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SO-TP19-02 | SO-TP20-01 | SO-TP20-02 | SO-TP21-01 | SO-TP22-01 | SO-TP23-01 | SO-TP25-01 | SO-TP27-01 | SO-TP28-01 | SO-TP29-01 | SO-TP31-01 | SO-TP33-01 |
| | | | | | | | | | | | |
| *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* |
| 3.20E+1 | 4.50E+1 | 2.20E+1 | 2.90E+1 | 2.50E+1 | 2.60E+1 | 1.30E+1 | 1.30E+1 | 1.70E+1 | 1.50E+1 | 2.20E+1 | 2.40E+1 |
| 1.10E-1 | 1.20E-1 | 1.00E-1 | 2.00E-1 | 3.40E-1 | 6.50E-1 | 1.00E-1 | 1.00E-1 | 1.70E-1 | 1.00E-1 | 1.00E-1 | 1.50E-1 |
| 6.40E+2 | 3.60E+3 | 2.20E+2 | 2.60E+2 | 3.00E+2 | 1.10E+3 | 6.20E+1 | 7.20E+1 | 4.70E+2 | 8.40E+1 | 8.40E+1 | 2.40E+2 |
| 2.70E+2 | 2.30E+2 | 6.00E+1 | 2.30E+2 | 1.10E+3 | 1.30E+2 | 2.40E+1 | 2.90E+1 | 6.00E+2 | 4.40E+1 | 3.00E+1 | 1.10E+2 |
| 1.00E+0 | 1.00E+0 | 1.00E+0 | 2.00E+2 | 1.80E+2 | 1.50E+2 | 4.20E+1 | 1.00E+0 | 6.30E+1 | 1.00E+0 | 2.60E+2 | 1.00E+0 |
| 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.20E+2 | 1.20E+2 | 1.10E+2 | 1.70E+1 | 1.00E+0 | 9.00E+1 | 1.00E+0 | 3.80E+1 | 1.00E+0 |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 2.10E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.10E-2 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 |

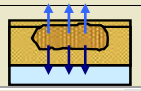
Analytical Data

| 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SO-TP36-01 | SO-TP37-01 | SO-TP38-01 | SO-TP48-01 | | | | | | | | |
| | | | | | | | | | | | |
| *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* |
| 2.20E+1 | 2.10E+1 | 2.20E+1 | 2.80E+1 | | | | | | | | |
| 7.10E-1 | 2.40E-1 | 4.40E-1 | 1.00E-1 | | | | | | | | |
| 1.10E+2 | 2.10E+2 | 5.00E+2 | 7.40E+1 | | | | | | | | |
| 4.50E+1 | 7.40E+1 | 1.40E+2 | 2.30E+1 | | | | | | | | |
| 1.00E+0 | 1.00E+0 | 1.00E+0 | 1.00E+0 | | | | | | | | |
| 1.00E+0 | 2.30E+1 | 7.60E+0 | 1.00E+0 | | | | | | | | |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | | | | | | | | |
| 1.00E-3 | 1.00E-3 | 1.00E-3 | 1.00E-3 | | | | | | | | |

# Transport Modeling Options

Site Name: Barnageeragh Landfill — Job ID:
Location: Skerries, Co. Dublin — Date: 29.08.18
Compl. By: P.McCabe

## 1. Vertical Transport, Surface Soil Column



### Outdoor Air Volatilization Factors

- ○ Surface soil volatilization model only — ASTM Model
- ◉ Combination surface soil/Johnson & Ettinger models
  - Thickness of surface soil zone: 1.00 (m)
- ○ User-specified VF from other model — Enter VF Values

### Indoor Air Volatilization Factors

More Info: *BioVapor* model

- ◉ Johnson & Ettinger model for soil and groundwater volatilization
- ○ Johnson & Ettinger for soil, Mass Flux model for groundwater
- ○ User-specified VF from other model — Enter VF Values

### Soil-to-Groundwater Leaching Factor

- ◉ ASTM Model
  - ☐ Apply Soil Attenuation Model (SAM)
  - ☐ Allow first-order biodecay — Enter Decay Rates
- ○ User-specified LF from other model — Enter LF Values

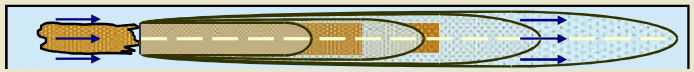
### Modeling Options

- ☐ Disable Mass Balance Limit
- ☐ Apply Dual Equilibrium Desorption Model

## 2. Lateral Air Dispersion Factor

| | Off-site 1 | Off-site 2 | |
|---|---|---|---|
| ◉ 3-D Gaussian dispersion model | | | |
| ○ User-Specified ADF | 1.00E+0 | 1.00E+0 | (-) |

## 3. Groundwater Dilution Attenuation Factor



### Calculate DAF using Domenico Model

- ◉ Domenico equation with dispersion only (no biodegradation)
- ○ Domenico equation first-order decay — Enter Decay Rates
- ○ Modified Domenico equation using electron acceptor superposition — Enter Site Data

[ ] Biodegradation Capacity: NC (mg/L)

— or —

### User-Specified DAF Values

- ○ DAF values from other model or site data — Enter DAF Values

## 4. Chemical Decay and Source Depletion

Enter Decay Rates
Enter Source Mass

## 5. Commands and Options

Main Screen | Print Sheet | Help

# Site-Specific Soil Parameters

Site Name: Barnageeragh Landfill | Job ID:
Location: Skerries, Co. Dublin | Date: 29.08.18
Compl. By: P.McCabe

## 1. Soil Source Zone Characteristics

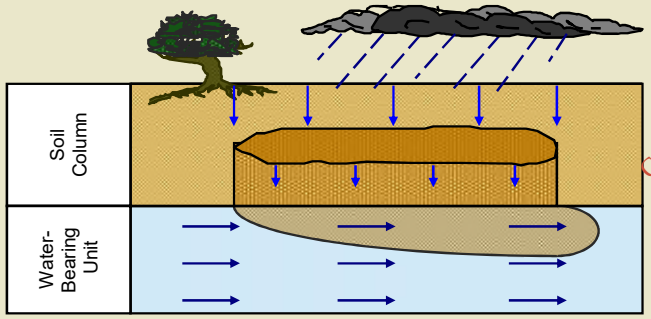
### Hydrogeology

| | | |
|---|---|---|
| Depth to water-bearing unit | 7.58 | (m) |
| Capillary zone thickness | 0.11 | (m) |
| Soil column thickness | 7.47 | (m) |

### Affected Soil Zone

| | | |
|---|---|---|
| Depth to top of affected soils | 1 | (m) |
| Depth to base of affected soils | 7.57 | (m) |
| Length of affected soil parallel to assumed GW flow direction | 160 | (m) |

| | Res/Com | Construction | |
|---|---|---|---|
| Affected soil area | 7659 | | (m^2) |
| Length of affected soil parallel to assumed wind direction | 65 | 65 | (m) |




## 2. Surface Soil Column

### Predominant USCS Soil Type

ML: Sandy Silt

Calculate

| | Vadose Zone | Capillary Fringe | |
|---|---|---|---|
| Volumetric water content | 0.26 | 0.387 | (-) |
| Volumetric air content | 0.17 | 0.043 | (-) |
| Total porosity | 0.43 | | (-) |
| Dry bulk density | 1.7 | | (kg/L) |
| Vertical hydraulic conductivity | 0.864 | | (cm/d) |
| Vapor permeability | 1.00E-15 | | (m^2) |
| Capillary zone thickness | 0.11 | | (m) |

### Net Rainfall Infiltration

| | | |
|---|---|---|
| Net infiltration estimate | 30.00 | (cm/yr) |
| or | or | |
| Average annual precipitation | 758 | (cm/yr) |

Calculate

### Partitioning Parameters

| | | |
|---|---|---|
| Fraction organic carbon - entire soil column | 0.34 | (-) |
| Fraction organic carbon - root zone | 0.01 | (-) |
| Soil/water pH | 7.9 | (-) |

## 3. Commands and Options

Main Screen | Use/Set Default Values | Print Sheet
Set Units | | Help

# Site-Specific Groundwater Parameters

Site Name: Barnageeragh Landfill — Job ID:
Location: Skerries, Co. Dublin — Date: 29.08.18
Compl. By: P.McCabe

## 1. Water-Bearing Unit

### Hydrogeology

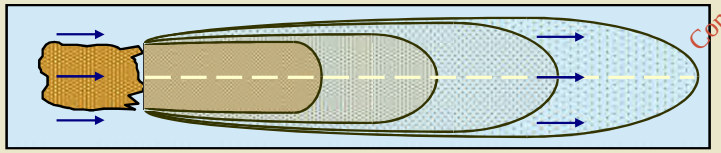
| | | |
|---|---|---|
| Groundwater Darcy velocity | 2.9E-9 | (cm/d) |
| Groundwater seepage velocity | 5.8E-8 | (cm/d) |
| or — Calculate | or | |
| Hydraulic conductivity | 2.9E-7 | (cm/d) |
| Hydraulic gradient | 0.01 | (-) |
| Effective porosity | 0.05 | (-) |

### Sorption

| | | |
|---|---|---|
| Fraction organic carbon--saturated zone | 0.34 | (-) |
| Groundwater pH | 6.2 | (-) |

## 2. Groundwater Source Zone

| | | |
|---|---|---|
| Groundwater plume width at source | 59 | (m) |
| Plume (mixing zone) thickness at source | 0.1 | (m) |
| Calculate — or | | |
| Saturated thickness | 0.1 | (m) |
| Length of source zone | 160 | (m) |



## 3. Groundwater Dispersion

Model: ASTM Default

| | GW Ingestion | | GW to Indoor Air | | |
|---|---|---|---|---|---|
| | Off-site 1 | Off-site 2 | Off-site 1 | Off-site 2 | |
| Distance to GW receptors | 0 | 0 | 5 | 0 | (m) |
| Calculate | | | | | |
| Longitudinal dispersivity | 0 | 1 | 0 | 0 | (m) |
| Transverse dispersivity | 0 | 1 | 0 | 0 | (m) |
| Vertical dispersivity | 0 | 1 | 0 | 0 | (m) |

## 4. Groundwater Discharge to Surface Water

| | Off-site 2 | |
|---|---|---|
| Distance to GW/SW disharge point | NA | (m) |
| Plume width at GW/SW discharge | 0 | (m) |
| Plume thickness at GW/SW discharge | 0 | (m) |
| Surface water flowrate at GW/SW discharge | 0 | (m^3/s) |

## 5. Commands and Options

Main Screen | Use/Set Default Values | Print Sheet
Set Units | | Help

# Site-Specific Air Parameters

Site Name: Barnageeragh Landfill — Job ID:
Location: Skerries, Co. Dublin — Date: 29.08.18
Compl. By: P.McCabe

## 1. Outdoor Air Pathway

### Dispersion in Air

| | Off-site 1 | Off-site 2 | |
|---|---|---|---|
| Distance to offsite air receptor | 5 | 0 | (m) |
| Horizontal dispersivity | 0.626226 | 0 | (m) |
| Vertical dispersivity | 0.434455 | 0 | (m) |

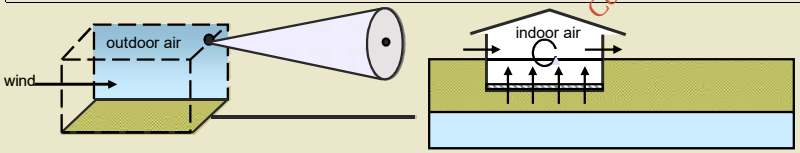
### Air Source Zone

| | | |
|---|---|---|
| Air mixing zone height | 2 | (m) |
| Ambient air velocity in mixing zone | 2.25 | (m/s) |
| Inverse mean conc. [Q/C term] | 79.25 | |

### Particulate Emissions

Model: ASTM Model

| | | |
|---|---|---|
| Particulate Emission Factor | 1.0E-11 | (kg/m^3) |
| or Calculate | | |
| Areal particulate emission flux | 6.9E-14 | (g/cm^2/s) |
| Fraction vegetative cover | 0.5 | (-) |
| Mean annual air velocity @ 7 m | 4.8 | (m/s) |
| Equivalent 7m air vel. threshold | 11.32 | (m/s) |
| Windspeed function [F(x) term] | 0.224 | (-) |




## 2. Indoor Air Pathway

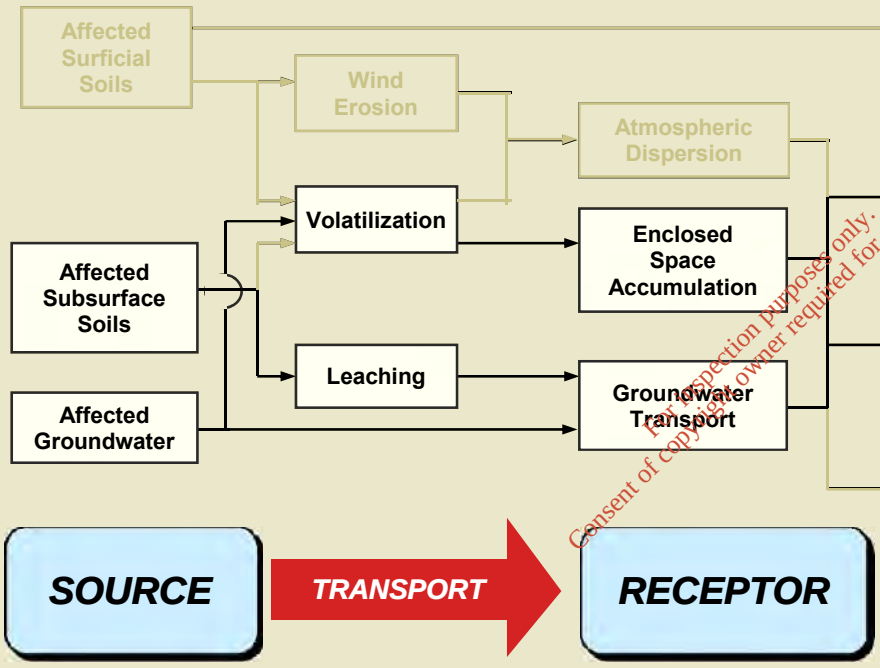
| | Residential | Commercial | |
|---|---|---|---|
| Building volume/area ratio | 4.8 | 3 | (m) |
| Foundation area | 60.88 | 70 | (m^2) |
| Foundation perimeter | 34.87 | 34 | (m) |
| Building air exchange rate | 1.4E-4 | 2.3E-4 | (1/s) |
| Depth to bottom of foundation slab | 0.15 | 0.15 | (m) |
| Convective air flow through cracks | 0.0E+0 | 0.0E+0 | (m^3/s) |
| Foundation thickness | 0.15 | | (m) |
| Foundation crack fraction | 0.001 | | (-) |
| Volumetric water content of cracks | 0.12 | | (-) |
| Volumetric air content of cracks | 0.26 | | (-) |
| Indoor/Outdoor differential pressure | 0 | | (g/cm/s^2) |
| Building Volume | 451 | 451 | (m^3) |
| Building Width Perpendicular to GW flow | 9.61 | 9.61 | (m) |
| Building Length Parallel to GW flow | 9.61 | 9.61 | (m) |
| Saturated Soil Zone Porosity | 0.05 | | (-) |
| Vertical Dispersivity | 0.006 | | (m) |
| Groundwater Seepage Velocity | 5.8E-08 | | (cm/d) |

## 3. Commands and Options

Main Screen | Use/Set Default Values | Print Sheet
Set Units | | Help

# Exposure Pathway Flowchart

Site Name: Job ID:
Location: Date: 0-Jan-00
Compl. By:






| Receptors | On-site | Off-site1 | Off-site2 |
|---|---|---|---|
| Soil Dermal Contact and Ingestion | Res./Constr. | NA | NA |
| Air Inhalation of Vapor and/or Particulates | Outdoor Air: Residential<br>Indoor Air: *Residential* | Residential<br>*Residential* | None<br>*None* |
| Groundwater Potable Water Ingestion | *None* | *None* | *None* |
| Surface Water Swimming, Fish Consumption, Aquatic Life | NA | NA | NA |

**Commands and Options**

Main Screen | Print Sheet | *Help*

## CHEMICAL DATA FOR SELECTED COCs

### Physical Property Data

| Constituent | CAS Number | Type | Molecular Weight (g/mole) | | Aqueous Solubility (@ 20 - 25 C) (mg/L) | | Soil Saturation Limit Calculated (mg/kg) | Vapor Pressure (@ 20 - 25 C) (mm Hg) | | Henry's Constant (@ 20 - 25 C) (unitless) | | log (Koc) or log (Kd) (@ 20 - 25 C) log(L/kg) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 7440-38-2 | M | 74.9216 | TX11 | 0 | TX11 | 1.00E+06 | 0.00E+00 | TX11 | 0.00E+00 | TX11 | f(pH) | Kd | - |
| Mercury | 7439-97-6 | M | 200.59 | TX11 | 0.03 | TX11 | 1.00E+06 | 1.30E-03 | TX11 | 4.74E-01 | TX11 | f(pH) | Kd | - |
| Zinc | 7440-66-6 | M | 65.39 | TX11 | 0 | TX11 | 1.00E+06 | 0.00E+00 | TX11 | 0.00E+00 | TX11 | f(pH) | Kd | TX11 |
| Lead (inorganic) | 7439-92-1 | M | 207.2 | TX11 | 0 | TX11 | 1.00E+06 | 0.00E+00 | TX11 | 0.00E+00 | TX11 | 1.00E+00 | Kd | TX11 |
| TPH - Aliph >C21-C34 | T-al2134 | OT | 400 | - | 0.0000025 | - | 5.36E+02 | 3.34E-07 | - | 7.26E+03 | - | 8.80E+00 | Koc | - |
| TPH - Arom >C21-C35 | T-ar2134 | OT | 240 | TPH | 0.0066 | TPH | 2.83E+02 | 3.34E-07 | TPH | 6.60E-04 | TPH | 5.10E+00 | Koc | TPH |
| Vinyl chloride | 75-01-4 | O | 62.49882 | TX11 | 2760 | TX11 | 1.17E+04 | 2.80E+03 | TX11 | 3.49E+00 | TX11 | 1.04E+00 | Koc | TX11 |
| Dichloroethylene, cis-1,2- | 156-59-2 | O | 96.94388 | TX11 | 4930 | TX11 | 4.95E+04 | 1.75E+02 | TX11 | 1.87E-01 | TX11 | 1.46E+00 | Koc | TX11 |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Job ID:
Date Completed: 29.08.18
Completed By: P.McCabe

## CHEMICAL DATA FOR SELECTED COCs

### Physical Property Data

| | pH specific Kd for non-organics | | | | | | | log(Kow) | | Diffusion Coefficients | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Surface Soil Column | | | Water Bearing Unit | | | | (@ 20 - 25 C) | | Air | | Water | |
| Constituent | Slope | y-Intercept | logKd_pH (L/kg) | Slope | y-Intercept | logKd_pH (L/kg) | | log(L/kg) | | ($cm^2/s$) | | ($cm^2/s$) | |
| Arsenic | 3.05E-02 | 1.25E+00 | 1.49E+00 | 3.05E-02 | 1.25E+00 | 1.49E+00 | E2 | 6.79E-01 | TX11 | 0.00E+00 | TX11 | 0.00E+00 | TX11 |
| Mercury | 7.70E-01 | -3.52E+00 | 2.56E+00 | 1.70E+00 | -9.73E+00 | 3.68E+00 | E2 | -4.71E-01 | TX11 | 3.07E-02 | TX11 | 6.30E-06 | TX11 |
| Zinc | 2.37E-01 | 1.80E-01 | 2.05E+00 | 2.37E-01 | 1.80E-01 | 2.05E+00 | E2 | -4.71E-01 | TX11 | 0.00E+00 | TX11 | 0.00E+00 | TX11 |
| Lead (inorganic) | - | - | - | - | - | - | - | 7.29E-01 | TX11 | 0.00E+00 | TX11 | 0.00E+00 | TX11 |
| TPH - Aliph >C21-C34 | - | - | - | - | - | - | - | - | - | 1.00E-01 | - | 1.00E-05 | - |
| TPH - Arom >C21-C35 | - | - | - | - | - | - | - | - | - | 1.00E-01 | TPH | 1.00E-05 | TPH |
| Vinyl chloride | - | - | - | - | - | - | - | 1.62E+00 | TX11 | 1.06E-01 | TX11 | 1.23E-05 | TX11 |
| Dichloroethylene, cis-1,2- | - | - | - | - | - | - | - | 1.86E+00 | TX11 | 7.35E-02 | TX11 | 1.13E-05 | TX11 |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Job ID:
Date Completed: 29.08.18
Completed By: P.McCabe

## CHEMICAL DATA FOR SELECTED COCs

### Miscellaneous Parameters

| Constituent | Analytical Detection Limits: Groundwater (mg/L) | | Analytical Detection Limits: Soil (mg/kg) | | Half Life (First-Order Decay): Saturated (days) | Half Life (First-Order Decay): Unsaturated (days) | | Soil-to-Plant Biotransfer Factors: Above-grd (unitless) | Soil-to-Plant Biotransfer Factors: Below-grd (unitless) | | Relative Bioavailability Factor | | Leaf Concen. Factor Calculated (mg/kg)/(mg/L) | Root Concen. Factor Calculated (mg/kg)/(mg/L) | Bioconcentration Factor | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.00E-02 | S | 5.30E-02 | S | - | - | - | 1.00E-02 | 8.00E-03 | TX11 | 7.80E-01 | TX11 | - | - | - | - |
| Mercury | 2.00E-04 | MC | - | - | - | - | - | 5.50E-03 | 1.40E-02 | TX08 | 1.00E+00 | TX11 | - | - | - | - |
| Zinc | 5.00E-03 | S | 2.00E-03 | S | - | - | - | 9.00E-02 | 4.40E-02 | TX11 | 1.00E+00 | TX11 | - | - | - | - |
| Lead (inorganic) | - | - | - | - | - | - | - | - | - | - | 1.00E+00 | TX11 | - | - | - | - |
| TPH - Aliph >C21-C34 | - | - | - | - | - | - | - | - | - | - | 1.00E+00 | TX11 | - | - | 890000 | LY |
| TPH - Arom >C21-C35 | - | - | - | - | - | - | - | - | - | - | 1.00E+00 | TX11 | - | - | 10000 | LY |
| Vinyl chloride | 2.00E-03 | S | 1.00E-02 | S | 2.88E+03 | 2.88E+03 | H | - | - | - | 1.00E+00 | TX11 | 8.77E-01 | 1.36E+00 | 10 | LY |
| Dichloroethylene, cis-1,2- | 1.00E-03 | S | 5.00E-03 | S | 2.88E+03 | 2.88E+03 | H | - | - | - | 1.00E+00 | TX11 | 1.05E+00 | 1.64E+00 | 15 | LY |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Job ID:
Date Completed: 29.08.18
Completed By: P.McCabe

## CHEMICAL DATA FOR SELECTED COCs

### Dermal Exposure

| Constituent | Water Dermal Permeability Data | | | | | |
|---|---|---|---|---|---|---|
| | Dermal Permeability Coeff. (cm/hr) | Lag time for Dermal Exposure (hr) | Critical Exposure Time (hr) | Relative Contr of Derm Perm Coeff | Water/Skin Derm Ads. Fact Calculated | |
| Arsenic | 0.001 | - | - | - | - | D |
| Mercury | - | - | - | - | - | - |
| Zinc | 0.0006 | - | - | - | - | D |
| Lead (inorganic) | - | - | - | - | - | - |
| TPH - Aliph >C21-C34 | - | - | - | - | - | - |
| TPH - Arom >C21-C35 | - | - | - | - | - | - |
| Vinyl chloride | 0.0073 | 0.21 | 0.51 | 0.0023 | 0.024929817 | D |
| Dichloroethylene, cis-1,2- | - | - | - | - | - | - |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Job ID:
Date Completed: 29.08.18
Completed By: P.McCabe

## CHEMICAL DATA FOR SELECTED COCs

| Constituent | Dermal Relative Abs. Factor Calculated | Absorbtion Fraction | | |
|---|---|---|---|---|
| | | Dermal (unitless) | Gastrointestinal (unitless) | |
| Arsenic | 0.031578947 | 0.03 | 0.95 | TX11 |
| Mercury | 0.142857143 | 0.01 | 0.07 | TX11 |
| Zinc | 0.05 | 0.01 | 0.2 | TX11 |
| Lead (inorganic) | 0.066666667 | 0.01 | 0.15 | TX11 |
| TPH - Aliph >C21-C34 | 0.2 | 0.1 | 0.5 | TX11 |
| TPH - Arom >C21-C35 | 0.146067416 | 0.13 | 0.89 | TX11 |
| Vinyl chloride | 0 | 0 | 1 | TX11 |
| Dichloroethylene, cis-1,2- | 0 | 0 | 1 | TX11 |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Job ID:
Date Completed: 29.08.18
Completed By: P.McCabe

## CHEMICAL DATA FOR SELECTED COCs

| Regulatory Standards | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | UK Soil Guideline Values | | | | |
| Constituent | Maximum Contaminant Level (mg/L) | | Time-Weighted Average Workplace Criteria ($mg/m^3$) | | Residential/Plant mg/kg | Residential/No Plant mg/kg | Allotments mg/kg | Commercial/Ind. mg/kg | |
| Arsenic | 0.01 | MC | 0.5 | OS | - | - | - | - | - |
| Mercury | 0.002 | MC | 0.1 | OS | - | - | - | - | - |
| Zinc | - | - | - | - | - | - | - | - | - |
| Lead (inorganic) | 0.015 | MC | 50 | OS | - | - | - | - | - |
| TPH - Aliph >C21-C34 | - | - | - | - | - | - | - | - | - |
| TPH - Arom >C21-C35 | - | - | - | - | - | - | - | - | - |
| Vinyl chloride | 0.002 | MC | 2.56 | OS | - | - | - | - | - |
| Dichloroethylene, cis-1,2- | 0.07 | MC | 790 | OS | - | - | - | - | - |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Job ID:
Date Completed: 29.08.18
Completed By: P.McCabe

## CHEMICAL DATA FOR SELECTED COCs

### Regulatory Standards

| | Surface Water Quality Criteria | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Aquatic Life Protection | | | | Human Health Protection | | | | | |
| Constituent | Freshwater (mg/L) | | Marine (mg/L) | | Drink & Freshwater Fish (mg/L) | | Freshwater Fish (mg/L) | | Saltwater Fish (mg/L) | |
| Arsenic | 0.19 | T1 | 0.078 | T1 | 0.05 | T3 | 0.00014 | E | 0.00014 | E |
| Mercury | 0.0013 | T1 | 0.0011 | T1 | 0.0000122 | T3 | 0.0000122 | T3 | 0.000025 | T3 |
| Zinc | - | - | 0.0842 | T1 | 9.1 | E | 69 | E | 69 | E |
| Lead (inorganic) | - | - | 0.0053 | T1 | 0.00498 | T3 | 0.025 | T3 | 0.0169 | T3 |
| TPH - Aliph >C21-C34 | - | - | - | - | - | - | - | - | - | - |
| TPH - Arom >C21-C35 | - | - | - | - | - | - | - | - | - | - |
| Vinyl chloride | - | - | - | - | 0.002 | T3 | 0.415 | T3 | 0.277 | T3 |
| Dichloroethylene, cis-1,2- | - | - | - | - | - | - | - | - | - | - |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Job ID:
Date Completed: 29.08.18
Completed By: P.McCabe

## CHEMICAL DATA FOR SELECTED COCs

### Toxicity Parameters

| Constituent | Oral RfD or TDSI (mg/kg/day) | | Dermal RfD or TDSI (mg/kg/day) | | Inhalation Equivalent RfC or TCA ($mg/m^3$) | | Oral Equivalent Slope Factor 1/(mg/kg/day) | | Dermal Equivalent Slope Factor 1/(mg/kg/day) | | Inhalation Equivalent Unit Risk Factor $1/(\mu g/m^3)$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.0003 | EPA-I | 0.0003 | D2 | - | - | 1.5 | EPA-I | 1.5 | D2 | 0.0043 | EPA-I |
| Mercury | 0.0003 | EPA-I | 0.0003 | D2 | 0.0003 | EPA-I | - | - | - | - | - | - |
| Zinc | 0.3 | EPA-I | 0.3 | D2 | - | - | - | - | - | - | - | - |
| Lead (inorganic) | - | - | - | - | - | - | - | - | - | - | - | - |
| TPH - Aliph >C21-C34 | 1.6 | TX11 | 1.6 | D2 | - | - | - | - | - | - | - | - |
| TPH - Arom >C21-C35 | 0.03 | TPH | 0.03 | D2 | - | - | - | - | - | - | - | - |
| Vinyl chloride | 0.003 | EPA-I | 0.003 | D2 | 0.06 | TX11 | 1.5 | EPA-I | 1.5 | D2 | 0.0000084 | TX11 |
| Dichloroethylene, cis-1,2- | 0.002 | EPA-I | 0.002 | D2 | 0.06 | TX11 | - | - | - | - | - | - |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Job ID:
Date Completed: 29.08.18
Completed By: P.McCabe

**RBCA SITE ASSESSMENT** | **User-Specified COC Data**

# REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

| CONSTITUENT | Representative COC Concentration | | | |
|---|---|---|---|---|
| | Groundwater | | Soils (1 - 7.6 m) | |
| | value (mg/L) | note | value (mg/kg) | note |
| Arsenic | 2.1E-3 | | 2.9E+1 | |
| Mercury | 8.0E-4 | | 3.4E-1 | |
| Zinc | 9.6E-3 | | 7.0E+2 | |
| Lead (inorganic) | 1.0E-3 | | 3.9E+2 | |
| TPH - Aliph >C21-C34 | 1.0E-4 | | 1.5E+2 | |
| TPH - Arom >C21-C35 | 1.0E-4 | | 1.4E+2 | |
| Vinyl chloride | 1.0E-3 | | 1.1E-3 | |
| Dichloroethylene, cis-1,2- | 1.0E-3 | | 1.7E-3 | |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

**RBCA SITE ASSESSMENT** | **User-Specified COC Data**

# REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

| CONSTITUENT | Representative COC Concentration | | | |
|---|---|---|---|---|
| | Groundwater | | Soils (1 - 7.6 m) | |
| | value (mg/L) | note | value (mg/kg) | note |
| Arsenic | 2.1E-3 | | 2.9E+1 | |
| Mercury | 8.0E-4 | | 3.4E-1 | |
| Zinc | 9.6E-3 | | 7.0E+2 | |
| Lead (inorganic) | 1.0E-3 | | 3.9E+2 | |
| TPH - Aliph >C21-C34 | 1.0E-4 | | 1.5E+2 | |
| TPH - Arom >C21-C35 | 1.0E-4 | | 1.4E+2 | |
| Vinyl chloride | 1.0E-3 | | 1.1E-3 | |
| Dichloroethylene, cis-1,2- | 1.0E-3 | | 1.7E-3 | |

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

# RBCA SITE ASSESSMENT

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin

Completed By: P.McCabe
Date Completed: 29.08.18



## TIER 2 GROUNDWATER CONCENTRATION DATA SUMMARY

| CONSTITUENTS DETECTED | | Analytical Method | | | Detected Concentrations | | |
|---|---|---|---|---|---|---|---|
| CAS No. | Name | Typical Detection Limit (mg/L) | No. of Samples | No. of Detects | Maximum Conc. (mg/L) | Mean Conc. (mg/L) | UCL on Mean Conc. (mg/L) |
| 7440-38-2 | Arsenic | #N/A | 35 | 35 | 8.9E-03 | 2.1E-03 | 2.6E-03 |
| 7439-97-6 | Mercury | #N/A | 35 | 35 | 7.3E-03 | 8.0E-04 | 1.1E-03 |
| 7440-66-6 | Zinc | #N/A | 35 | 35 | 6.4E-02 | 9.6E-03 | 1.4E-02 |
| 7439-92-1 | Lead (inorganic) | #N/A | 35 | 35 | 1.0E-03 | 1.0E-03 | 1.0E-03 |
| T-al2134 | TPH - Aliph >C21-C34 | #N/A | 35 | 35 | 1.0E-04 | 1.0E-04 | 1.0E-04 |
| T-ar2134 | TPH - Arom >C21-C35 | #N/A | 35 | 35 | 1.0E-04 | 1.0E-04 | 1.0E-04 |

# RBCA SITE ASSESSMENT

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin

Completed By: P.McCabe
Date Completed: 29.08.18



## TIER 2 SOIL CONCENTRATION DATA SUMMARY

| CONSTITUENTS DETECTED | | Analytical Method | | | Detected Concentrations | | |
|---|---|---|---|---|---|---|---|
| CAS No. | Name | Typical Detection Limit (mg/kg) | No. of Samples | No. of Detects | Maximum Conc. (mg/kg) | Mean Conc. (mg/kg) | UCL on Mean Conc. (mg/kg) |
| 7440-38-2 | Arsenic | 2.0E+00 | 39 | 39 | 6.1E+01 | 2.6E+01 | 2.9E+01 |
| 7439-97-6 | Mercury | 1.0E-01 | 39 | 39 | 8.0E-01 | 2.9E-01 | 3.4E-01 |
| 7440-66-6 | Zinc | 2.0E+00 | 39 | 39 | 3.6E+03 | 5.3E+02 | 7.0E+02 |
| 7439-92-1 | Lead (inorganic) | 2.0E+00 | 39 | 39 | 1.7E+03 | 2.9E+02 | 3.9E+02 |
| T-al2134 | TPH - Aliph >C21-C34 | 1.0E+00 | 39 | 39 | 8.1E+02 | 9.8E+01 | 1.5E+02 |
| T-ar2134 | TPH - Arom >C21-C35 | 1.0E+00 | 39 | 39 | 1.2E+03 | 8.0E+01 | 1.4E+02 |
| 75-01-4 | Vinyl chloride | 1.0E-03 | 39 | 39 | 2.1E-03 | 1.0E-03 | 1.1E-03 |

# RBCA SITE ASSESSMENT



## TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**OUTDOOR AIR EXPOSURE PATHWAYS** ☐ **(Checked if Pathway is Complete)**

**SURFACE SOILS (1 - 1 m):**
**VAPOR AND DUST INHALATION**

| Constituents of Concern | 1) Source Medium: Soil Conc. (mg/kg) | 2) NAF Value (m^3/kg) Receptor: On-site (0 m) Residential | On-site (0 m) Construction Worker | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None | 3) Exposure Medium Outdoor Air: POE Conc. (mg/m^3) (1) / (2): On-site (0 m) Residential | On-site (0 m) Construction Worker | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.9E+1 | | | | | | | | |
| Mercury | 3.4E-1 | | | | | | | | |
| Zinc | 7.0E+2 | | | | | | | | |
| Lead (inorganic) | 3.9E+2 | | | | | | | | |
| TPH - Aliph >C21-C34 | 1.5E+2 | | | | | | | | |
| TPH - Arom >C21-C35 | 1.4E+2 | | | | | | | | |
| Vinyl chloride | 1.1E-3 | | | | | | | | |
| Dichloroethylene, cis-1,2- | 1.7E-3 | | | | | | | | |



NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**OUTDOOR AIR EXPOSURE PATHWAYS**

**SURFACE SOILS (1 - 1 m):**

**VAPOR AND DUST INHALATION (cont'd)**

| Constituents of Concern | 4) Exposure Multiplier (EFxED)/(ATx365) (unitless) | | | | 5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4) | | | |
|---|---|---|---|---|---|---|---|---|
| | On-site (0 m) | | Off-site 1 (5 m) | Off-site 2 (0 m) | On-site (0 m) | | Off-site 1 (5 m) | Off-site 2 (0 m) |
| | Residential | Construction Worker | Residential | None | Residential | Construction Worker | Residential | None |
| Arsenic | | | | | | | | |
| Mercury | | | | | | | | |
| Zinc | | | | | | | | |
| Lead (inorganic) | | | | | | | | |
| TPH - Aliph >C21-C34 | | | | | | | | |
| TPH - Arom >C21-C35 | | | | | | | | |
| Vinyl chloride | | | | | | | | |
| Dichloroethylene, cis-1,2- | | | | | | | | |

* = Chemical with user-specified data



NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**OUTDOOR AIR EXPOSURE PATHWAYS** ■ **(Checked if Pathway is Complete)**

**SUBSURFACE SOILS (1 - 7.6 m):**

**VAPOR INHALATION**

| Constituents of Concern | 1) Source Medium | 2) NAF Value (m^3/kg) Receptor | | | 3) Exposure Medium Outdoor Air: POE Conc. (mg/m^3) (1) / (2) | | |
|---|---|---|---|---|---|---|---|
| | Soil Conc. (mg/kg) | On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None | On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None |
| Arsenic | 2.9E+1 | VFsamb | VFsamb | | | | |
| Mercury | 3.4E-1 | 1.2E+6 | 1.2E+6 | | 2.9E-7 | 2.9E-7 | |
| Zinc | 7.0E+2 | VFsamb | VFsamb | | | | |
| Lead (inorganic) | 3.9E+2 | VFsamb | VFsamb | | | | |
| TPH - Aliph >C21-C34 | 1.5E+2 | 1.4E+7 | 1.4E+7 | | 1.1E-5 | 1.1E-5 | |
| TPH - Arom >C21-C35 | 1.4E+2 | 1.9E+10 | 1.9E+10 | | 7.3E-9 | 7.3E-9 | |
| Vinyl chloride | 1.1E-3 | 5.9E+3 | 5.9E+3 | | 1.8E-7 | 1.8E-7 | |
| Dichloroethylene, cis-1,2- | 1.7E-3 | 3.4E+4 | 3.4E+4 | | 5.0E-8 | 5.0E-8 | |



NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**OUTDOOR AIR EXPOSURE PATHWAYS**

**SUBSURFACE SOILS (1 - 7.6 m):**

**VAPOR INHALATION (cont'd)**

| Constituents of Concern | 4) Exposure Multiplier (EFxED)/(ATx365) (unitless) | | | 5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4) | | |
|---|---|---|---|---|---|---|
| | On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None | On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None |
| Arsenic | 4.1E-1 | 4.1E-1 | | | | |
| Mercury | 9.6E-1 | 9.6E-1 | | 2.8E-7 | 2.8E-7 | |
| Zinc | 9.6E-1 | 9.6E-1 | | | | |
| Lead (inorganic) | 9.6E-1 | 9.6E-1 | | | | |
| TPH - Aliph >C21-C34 | 9.6E-1 | 9.6E-1 | | 1.1E-5 | 1.1E-5 | |
| TPH - Arom >C21-C35 | 9.6E-1 | 9.6E-1 | | 7.0E-9 | 7.0E-9 | |
| Vinyl chloride | 4.1E-1 | 4.1E-1 | | 7.5E-8 | 7.5E-8 | |
| Dichloroethylene, cis-1,2- | 9.6E-1 | 9.6E-1 | | 4.8E-8 | 4.8E-8 | |



NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

# RBCA SITE ASSESSMENT



## TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**OUTDOOR AIR EXPOSURE PATHWAYS** ☐ **(Checked if Pathway is Complete)**

**GROUNDWATER: VAPOR INHALATION**

**Exposure Concentration**

| Constituents of Concern | 1) Source Medium: Groundwater Conc. (mg/L) | 2) NAF Value (m^3/L) Receptor: On-site (0 m) None | Off-site 1 (5 m) None | Off-site 2 (0 m) None | 3) Exposure Medium Outdoor Air: POE Conc. (mg/m^3) (1) / (2): On-site (0 m) None | Off-site 1 (5 m) None | Off-site 2 (0 m) None |
|---|---|---|---|---|---|---|---|
| Arsenic | 2.1E-3 | | | | | | |
| Mercury | 8.0E-4 | | | | | | |
| Zinc | 9.6E-3 | | | | | | |
| Lead (inorganic) | 1.0E-3 | | | | | | |
| TPH - Aliph >C21-C34 | 1.0E-4 | | | | | | |
| TPH - Arom >C21-C35 | 1.0E-4 | | | | | | |
| Vinyl chloride | 1.0E-3 | | | | | | |
| Dichloroethylene, cis-1,2- | 1.0E-3 | | | | | | |



NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**OUTDOOR AIR EXPOSURE PATHWAYS**

**GROUNDWATER: VAPOR INHALATION (cont'd)**

| Constituents of Concern | 4) Exposure Multiplier (EFxED)/(ATx365) (unitless) | | | 5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4) | | |
|---|---|---|---|---|---|---|
| | On-site (0 m) None | Off-site 1 (5 m) None | Off-site 2 (0 m) None | On-site (0 m) None | Off-site 1 (5 m) None | Off-site 2 (0 m) None |
| Arsenic | | | | | | |
| Mercury | | | | | | |
| Zinc | | | | | | |
| Lead (inorganic) | | | | | | |
| TPH - Aliph >C21-C34 | | | | | | |
| TPH - Arom >C21-C35 | | | | | | |
| Vinyl chloride | | | | | | |
| Dichloroethylene, cis-1,2- | | | | | | |



NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**OUTDOOR AIR EXPOSURE PATHWAYS**

**MAXIMUM PATHWAY EXPOSURE (mg/m^3)**

***Maximum average expsosure concentration from soil and groundwater routes.)***

| Constituents of Concern | On-site (0 m) Residential | On-site (0 m) Construction Worker | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None |
|---|---|---|---|---|
| Arsenic | | | | |
| Mercury | 2.8E-7 | | 2.8E-7 | |
| Zinc | | | | |
| Lead (inorganic) | | | | |
| TPH - Aliph >C21-C34 | 1.1E-5 | | 1.1E-5 | |
| TPH - Arom >C21-C35 | 7.0E-9 | | 7.0E-9 | |
| Vinyl chloride | 7.5E-8 | | 7.5E-8 | |
| Dichloroethylene, cis-1,2- | 4.8E-8 | | 4.8E-8 | |



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 PATHWAY RISK CALCULATION

**OUTDOOR AIR EXPOSURE PATHWAYS** ■ **(Checked if Pathway is Complete)**

CARCINOGENIC RISK

| Constituents of Concern | (1) Is Carcinogenic | (2) Maximum Carcinogenic Exposure (mg/m^3) | | | | (3) Inhalation Unit Risk Factor (µg/m^3)^-1 | (4) Individual COC Risk (2) x (3) x 1000 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | On-site (0 m) | | Off-site 1 (5 m) | Off-site 2 (0 m) | | On-site (0 m) | | Off-site 1 (5 m) | Off-site 2 (0 m) |
| | | Residential | Construction Worker | Residential | None | | Residential | Construction Worker | Residential | None |
| Arsenic | TRUE | | | | - | 4.3E-3 | | | | |
| Mercury | FALSE | - | - | - | - | - | | | | |
| Zinc | FALSE | - | - | | - | - | | | | |
| Lead (inorganic) | FALSE | - | - | | - | - | | | | |
| TPH - Aliph >C21-C34 | FALSE | - | - | - | - | - | | | | |
| TPH - Arom >C21-C35 | FALSE | - | - | - | - | - | | | | |
| Vinyl chloride | TRUE | 7.5E-8 | | 7.5E-8 | - | 8.4E-6 | 6.3E-10 | | 6.3E-10 | |
| Dichloroethylene, cis-1,2- | FALSE | - | - | - | - | - | | | | |
| ***Total Pathway Carcinogenic Risk =*** | | | | | | | **6.3E-10** | | **6.3E-10** | |



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin

Completed By: P.McCabe
Date Completed: 29.08.18

Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 PATHWAY RISK CALCULATION

**OUTDOOR AIR EXPOSURE PATHWAYS** ■ **(Checked if Pathway is Complete)**

TOXIC EFFECTS

| Constituents of Concern | (5) Maximum Toxicant Exposure (mg/m^3) On-site (0 m) Residential | On-site (0 m) Construction Worker | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None | (6) Inhalation Reference Conc. (mg/m^3) | (7) Individual COC Hazard Quotient (5) / (6) On-site (0 m) Residential | On-site (0 m) Construction Worker | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.0E+0 | | 0.0E+0 | | - | | | | |
| Mercury | 2.8E-7 | | 2.8E-7 | | 3.0E-4 | 9.4E-4 | | 9.4E-4 | |
| Zinc | | | | | - | | | | |
| Lead (inorganic) | | | | | - | | | | |
| TPH - Aliph >C21-C34 | 1.1E-5 | | 1.1E-5 | | - | | | | |
| TPH - Arom >C21-C35 | 7.0E-9 | | 7.0E-9 | | - | | | | |
| Vinyl chloride | 1.8E-7 | | 1.8E-7 | | 6.0E-2 | 2.9E-6 | | 2.9E-6 | |
| Dichloroethylene, cis-1,2- | 4.8E-8 | | 4.8E-8 | | 6.0E-2 | 8.0E-7 | | 8.0E-7 | |
| ***Total Pathway Hazard Index =*** | | | | | | **9.4E-4** | | **9.4E-4** | |



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin

Completed By: P.McCabe
Date Completed: 29.08.18

Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**INDOOR AIR EXPOSURE PATHWAYS** ■ **(Checked if Pathway is Complete)**

**SOILS (1 - 7.6 m): VAPOR INTRUSION INTO BUILDINGS**

| Constituents of Concern | 1) Source Medium<br>Soil Conc. (mg/kg) | 2) NAF Value (L/kg)<br>Receptor<br>On-site (0 m)<br>Residential | 3) Exposure Medium<br>Indoor Air: POE Conc. (mg/m^3) (1) / (2)<br>On-site (0 m)<br>Residential | 4) Exposure Multiplier<br>(EFxED)/(ATx365) (unitless)<br>On-site (0 m)<br>Residential | 5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4)<br>On-site (0 m)<br>Residential |
|---|---|---|---|---|---|
| Arsenic | 2.9E+1 | zero VF | | 4.1E-1 | |
| Mercury | 3.4E-1 | 3.3E+5 | 1.0E-6 | 9.6E-1 | 9.9E-7 |
| Zinc | 7.0E+2 | zero VF | | 9.6E-1 | |
| Lead (inorganic) | 3.9E+2 | zero VF | | 9.6E-1 | |
| TPH - Aliph >C21-C34 | 1.5E+2 | 3.9E+6 | 3.9E-5 | 9.6E-1 | 3.7E-5 |
| TPH - Arom >C21-C35 | 1.4E+2 | 8.4E+9 | 1.6E-8 | 9.6E-1 | 1.5E-8 |
| Vinyl chloride | 1.1E-3 | 1.5E+2 | 7.1E-6 | 4.1E-1 | 2.9E-6 |
| Dichloroethylene, cis-1,2- | 1.7E-3 | 9.7E+3 | 1.7E-7 | 9.6E-1 | 1.7E-7 |

* = Chemical with user-specified data

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
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## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**INDOOR AIR EXPOSURE PATHWAYS** ☐ **(Checked if Pathway is Complete)**

**GROUNDWATER: VAPOR INTRUSION INTO BUILDINGS**

**Exposure Concentration**

| **Constituents of Concern** | 1) Source Medium Groundwater Conc. (mg/L) | 2) NAF Value (m^3/L) Receptor On-site (0 m) None | Off-site 1 (5 m) None | Off-site 2 (0 m) None | 3) Exposure Medium Indoor Air: POE Conc. (mg/m^3) (1) / (2) On-site (0 m) Residential | Off-site 1 (5 m) None | Off-site 2 (0 m) None |
|---|---|---|---|---|---|---|---|
| Arsenic | 2.1E-3 | | | | | | |
| Mercury | 8.0E-4 | | | | | | |
| Zinc | 9.6E-3 | | | | | | |
| Lead (inorganic) | 1.0E-3 | | | | | | |
| TPH - Aliph >C21-C34 | 1.0E-4 | | | | | | |
| TPH - Arom >C21-C35 | 1.0E-4 | | | | | | |
| Vinyl chloride | 1.0E-3 | | | | | | |
| Dichloroethylene, cis-1,2- | 1.0E-3 | | | | | | |

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**INDOOR AIR EXPOSURE PATHWAYS**

**GROUNDWATER: VAPOR INTRUSION INTO BUILDINGS**

| Constituents of Concern | 4) Exposure Multiplier (EFxED)/(ATx365) (unitless) | | | 5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4) | | |
|---|---|---|---|---|---|---|
| | On-site (0 m) Residential | Off-site 1 (5 m) None | Off-site 2 (0 m) None | On-site (0 m) Residential | Off-site 1 (5 m) None | Off-site 2 (0 m) None |
| Arsenic | | | | | | |
| Mercury | | | | | | |
| Zinc | | | | | | |
| Lead (inorganic) | | | | | | |
| TPH - Aliph >C21-C34 | | | | | | |
| TPH - Arom >C21-C35 | | | | | | |
| Vinyl chloride | | | | | | |
| Dichloroethylene, cis-1,2- | | | | | | |

* = Chemical with user-specified data

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**INDOOR AIR EXPOSURE PATHWAYS** ■ **(Checked if Pathway is Complete)**

**SOIL LEACHING TO GW- VAPOR INTRUSION INTO BUILDINGS**

**Exposure Concentration**

| Constituents of Concern | 1) Source Medium | 2) NAF Value (m^3/L) Receptor | | | 3) Exposure Medium Indoor Air: POE Conc. (mg/m^3) (1) / (2) | | |
|---|---|---|---|---|---|---|---|
| | Soil Conc. (mg/kg) | On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None | On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None |
| Arsenic | 2.9E+1 | zero VF | zero VF | | | | |
| Mercury | 3.4E-1 | 4.8E+5 | 3.0E+6 | | 7.1E-7 | 1.1E-7 | |
| Zinc | 7.0E+2 | zero VF | zero VF | | | | |
| Lead (inorganic) | 3.9E+2 | zero VF | zero VF | | | | |
| TPH - Aliph >C21-C34 | 1.5E+2 | 6.3E+6 | 3.9E+7 | | 2.4E-5 | 3.9E-6 | |
| TPH - Arom >C21-C35 | 1.4E+2 | 9.7E+9 | 6.1E+10 | | 1.4E-8 | 2.2E-9 | |
| Vinyl chloride | 1.1E-3 | 2.4E+2 | 1.5E+3 | | 4.5E-6 | 7.1E-7 | |
| Dichloroethylene, cis-1,2- | 1.7E-3 | 1.3E+4 | 8.5E+4 | | 1.3E-7 | 2.0E-8 | |

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

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## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**INDOOR AIR EXPOSURE PATHWAYS**

**SOIL LEACHING TO GW- VAPOR INTRUSION INTO BUILDINGS**

| Constituents of Concern | 4) Exposure Multiplier (EFxED)/(ATx365) (unitless) | | | 5) Average Inhalation Exposure Concentration (mg/m^3) (3) X (4) | | |
|---|---|---|---|---|---|---|
| | On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None | On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None |
| Arsenic | 4.1E-1 | 4.1E-1 | | | | |
| Mercury | 9.6E-1 | 9.6E-1 | | 6.8E-7 | 1.1E-7 | |
| Zinc | 9.6E-1 | 9.6E-1 | | | | |
| Lead (inorganic) | 9.6E-1 | 9.6E-1 | | | | |
| TPH - Aliph >C21-C34 | 9.6E-1 | 9.6E-1 | | 2.3E-5 | 3.7E-6 | |
| TPH - Arom >C21-C35 | 9.6E-1 | 9.6E-1 | | 1.4E-8 | 2.1E-9 | |
| Vinyl chloride | 4.1E-1 | 4.1E-1 | | 1.8E-6 | 2.9E-7 | |
| Dichloroethylene, cis-1,2- | 9.6E-1 | 9.6E-1 | | 1.2E-7 | 1.9E-8 | |

* = Chemical with user-specified data

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

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## RBCA SITE ASSESSMENT



### TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

**INDOOR AIR EXPOSURE PATHWAYS**

**MAXIMUM PATHWAY EXPOSURE (mg/m^3)**

***(Maximum average exposure concentration from soil and groundwater routes.)***

| Constituents of Concern | On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None |
|---|---|---|---|
| Arsenic | | | |
| Mercury | 9.9E-7 | 1.1E-7 | |
| Zinc | | | |
| Lead (inorganic) | | | |
| TPH - Aliph >C21-C34 | 3.7E-5 | 3.7E-6 | |
| TPH - Arom >C21-C35 | 1.5E-8 | 2.1E-9 | |
| Vinyl chloride | 2.9E-6 | 2.9E-7 | |
| Dichloroethylene, cis-1,2- | 1.7E-7 | 1.9E-8 | |



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 PATHWAY RISK CALCULATION

**INDOOR AIR EXPOSURE PATHWAYS** ■ **(Checked if Pathway is Complete)**

CARCINOGENIC RISK

| Constituents of Concern | (1) Carcinogenic Classification | (2) Maximum Carcinogenic Exposure (mg/m^3) On-site (0 m) Residential | (2) Off-site 1 (5 m) Residential | (2) Off-site 2 (0 m) None | (3) Inhalation Unit Risk Factor (µg/m^3)^-1 | (4) Individual COC Risk (2) x (3) x 1000 On-site (0 m) Residential | (4) Off-site 1 (5 m) Residential | (4) Off-site 2 (0 m) None |
|---|---|---|---|---|---|---|---|---|
| Arsenic | TRUE | | | - | 4.3E-3 | | | |
| Mercury | FALSE | - | - | - | - | | | |
| Zinc | FALSE | - | - | - | - | | | |
| Lead (inorganic) | FALSE | - | - | - | - | | | |
| TPH - Aliph >C21-C34 | FALSE | - | - | - | - | | | |
| TPH - Arom >C21-C35 | FALSE | - | - | - | - | | | |
| Vinyl chloride | TRUE | 2.9E-6 | 2.9E-7 | - | 8.4E-6 | 2.4E-8 | 2.5E-9 | |
| Dichloroethylene, cis-1,2- | FALSE | - | - | - | - | | | |
| | | | ***Total Pathway Carcinogenic Risk =*** | | | **2.4E-8** | **2.5E-9** | |



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## RBCA SITE ASSESSMENT



### TIER 2 PATHWAY RISK CALCULATION

**INDOOR AIR EXPOSURE PATHWAYS** ■ **(Checked if Pathway is Complete)**

TOXIC EFFECTS

| Constituents of Concern | (5) Maximum Toxicant Exposure (mg/m^3) On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None | (6) Inhalation Reference Concentration (mg/m^3) | (7) Individual COC Hazard Quotient (5) / (6) On-site (0 m) Residential | Off-site 1 (5 m) Residential | Off-site 2 (0 m) None |
|---|---|---|---|---|---|---|---|
| Arsenic | 0.0E+0 | 0.0E+0 | NC | - | | | |
| Mercury | 9.9E-7 | 1.1E-7 | NC | 3.0E-4 | 3.3E-3 | 3.6E-4 | |
| Zinc | | | NC | - | | | |
| Lead (inorganic) | | | NC | - | | | |
| TPH - Aliph >C21-C34 | 3.7E-5 | 3.7E-6 | NC | - | | | |
| TPH - Arom >C21-C35 | 1.5E-8 | 2.1E-9 | NC | - | | | |
| Vinyl chloride | 6.8E-6 | 6.8E-7 | NC | 6.0E-2 | 1.1E-4 | 1.1E-5 | |
| Dichloroethylene, cis-1,2- | 1.7E-7 | 1.9E-8 | NC | 6.0E-2 | 2.8E-6 | 3.2E-7 | |
| | | | | ***Total Pathway Hazard Index =*** | **3.4E-3** | **3.7E-4** | |



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION



**SOIL EXPOSURE PATHWAY** ■ **(Checked if Pathway is Complete)**

**SURFACE SOILS: ON SITE**

| Constituents of Concern | 1) Source/Exposure Medium | 2) Exposure Multiplier | | 3) Average Daily Intake Rate (mg/kg/day) (1) x (2) | |
|---|---|---|---|---|---|
| | Surface Soil Conc. (mg/kg) | Residential | Construction Worker | Residential | Construction Worker |
| Arsenic | 2.9E+1 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |
| Mercury | 3.4E-1 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |
| Zinc | 7.0E+2 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |
| Lead (inorganic) | 3.9E+2 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |
| TPH - Aliph >C21-C34 | 1.5E+2 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |
| TPH - Arom >C21-C35 | 1.4E+2 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |
| Vinyl chloride | 1.1E-3 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |
| Dichloroethylene, cis-1,2- | 1.7E-3 | 0.0E+0 | 0.0E+0 | 0.0E+0 | 0.0E+0 |

NOTE: RAF = Relative absorption factor (-)
M = Adherence factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
IR = Soil ingestion rate (mg/day)
SA = Skin exposure area (cm^2/day)

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## TIER 2 PATHWAY RISK CALCULATION



**SOIL EXPOSURE PATHWAY** ■ **(Checked if Pathway is Complete)**

CARCINOGENIC RISK

| Constituents of Concern | (1) Is Carcinogenic | (2) Total Carcinogenic Intake Rate (mg/kg/day) | | | | (3) Slope Factor (mg/kg/day)^-1 | | (4) Individual COC Risk | |
|---|---|---|---|---|---|---|---|---|---|
| | | (a) via Ingestion | (b) via Dermal Contact | (c) via Ingestion | (d) via Dermal Contact | (a) Oral | (b) Dermal | (2a)x(3a) + (2b)x(3b) | (2c)x(3a) + (2d)x(3b) |
| | | Residential | | Construction Worker | | | | Residential | Construction Worker |
| Arsenic | TRUE | 0.0E+0 | | 2.9E-7 | 1.4E-7 | 1.5E+0 | 1.5E+0 | 0.0E+0 | 6.5E-7 |
| Mercury | FALSE | | | Missing Sfo | Tox? | - | - | | - |
| Zinc | FALSE | | | Missing Sfo | Tox? | - | - | | - |
| Lead (inorganic) | FALSE | | | Missing Sfo | Tox? | - | - | | - |
| TPH - Aliph >C21-C34 | FALSE | | | Missing Sfo | Tox? | - | - | | - |
| TPH - Arom >C21-C35 | FALSE | | | Missing Sfo | Tox? | - | - | | - |
| Vinyl chloride | TRUE | 0.0E+0 | | 1.1E-11 | 0.0E+0 | 1.5E+0 | 1.5E+0 | 0.0E+0 | 1.6E-11 |
| Dichloroethylene, cis-1,2- | FALSE | | | Missing Sfo | Tox? | - | - | | - |

* No dermal slope factor available--oral slope factor used.

***Total Pathway Carcinogenic Risk =*** **0.0E+0** **6.5E-7**



Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

## TIER 2 PATHWAY RISK CALCULATION



**SOIL EXPOSURE PATHWAY** ■ **(Checked if Pathway is Complete)**

TOXIC EFFECTS

| Constituents of Concern | (5) Total Toxicant Intake Rate (mg/kg/day) (a) via Ingestion | (b) via Dermal Contact | (c) via Ingestion | (d) via Dermal Contact | (6) Reference Dose (mg/kg-day) (a) Oral | (b) Dermal | (7) Individual COC Hazard Quotient (5a)/(6a) + (5b)/(6b) Residential | (5c)/(6a) + (5d)/(6b) Construction Worker |
|---|---|---|---|---|---|---|---|---|
| | Residential | | Construction Worker | | | | | |
| Arsenic | 0.0E+0 | | | | 3.0E-4 | 3.0E-4 | 0.0E+0 | |
| Mercury | 0.0E+0 | | | | 3.0E-4 | 3.0E-4 | 0.0E+0 | |
| Zinc | 0.0E+0 | | | | 3.0E-1 | 3.0E-1 | 0.0E+0 | |
| Lead (inorganic) | Tox? | | | | - | - | | |
| TPH - Aliph >C21-C34 | 0.0E+0 | | | | 1.6E+0 | 1.6E+0 | 0.0E+0 | |
| TPH - Arom >C21-C35 | 0.0E+0 | | | | 3.0E-2 | 3.0E-2 | 0.0E+0 | |
| Vinyl chloride | 0.0E+0 | | | | 3.0E-3 | 3.0E-3 | 0.0E+0 | |
| Dichloroethylene, cis-1,2- | 0.0E+0 | | | | 2.0E-3 | 2.0E-3 | 0.0E+0 | |

* No dermal reference dose available--oral reference dose used.

***Total Pathway Hazard Index =*** **0.0E+0**

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe

Date Completed: 29.08.18
Job ID:

**RBCA SITE ASSESSMENT** | **Baseline Risk Summary-All Pathways**

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe
Date Completed: 29.08.18



## BASELINE RISK SUMMARY TABLE

| | BASELINE CARCINOGENIC RISK | | | | | BASELINE TOXIC EFFECTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Individual COC Risk | | Cumulative COC Risk | | Risk | Hazard Quotient | | Hazard Index | | Toxicity |
| EXPOSURE PATHWAY | Maximum Value | Target Risk | Total Value | Target Risk | Limit(s) Exceeded? | Maximum Value | Applicable Limit | Total Value | Applicable Limit | Limit(s) Exceeded? |
| ***OUTDOOR AIR EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ■ | 6.3E-10 | 1.0E-5 | 6.3E-10 | 1.0E-5 | ☐ | 9.4E-4 | 1.0E+0 | 9.4E-4 | 1.0E+0 | ☐ |
| ***INDOOR AIR EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ■ | 2.4E-8 | 1.0E-5 | 2.4E-8 | 1.0E-5 | ☐ | 3.3E-3 | 1.0E+0 | 3.4E-3 | 1.0E+0 | ☐ |
| ***SOIL EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ■ | 6.5E-7 | 1.0E-5 | 6.5E-7 | 1.0E-5 | ☐ | NC | 1.0E+0 | NC | 1.0E+0 | ☐ |
| ***GROUNDWATER EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ☐ | NA | NA | NA | NA | ☐ | NA | NA | NA | NA | ☐ |
| ***SURFACE WATER EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ☐ | NA | NA | NA | NA | ☐ | NA | NA | NA | NA | ☐ |
| **CRITICAL EXPOSURE PATHWAY (Maximum Values From Complete Pathways)** | | | | | | | | | | |
| | ***6.5E-7*** | ***1.0E-5*** | ***6.5E-7*** | ***1.0E-5*** | ☐ | ***3.3E-3*** | ***1.0E+0*** | ***3.4E-3*** | ***1.0E+0*** | ☐ |
| | ***Soil*** | | ***Soil*** | | | ***Indoor Air*** | | ***Indoor Air*** | | |

## RBCA SITE ASSESSMENT

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin

Completed By: P.McCabe
Date Completed: 29.08.18

Job ID:



### SURFACE SOIL (1 - 1 m) SSTL VALUES

Target Risk (Class A & B) 1.0E-5
Target Hazard Quotient 1.0E+0

Groundwater DAF Option: Domenico - No Decay (One-directional vert. dispersion)

**SSTL Results For Complete Exposure Pathways (Checked if Pathway is Complete)**

| CONSTITUENTS OF CONCERN | | Representative Concentration | o Soil Leaching to Groundwater Ingestion / Discharge to Surface Water | | | n Soil Leaching to Groundwater/ Groundwater Volatilization to Indoor Air | | | n Soil Vol. to Indoor Air | n Soil Volatilization and Surface Soil Particulates to Outdoor Air | | | | n Direct Contact Pathways: Inhalation | | Applicable SSTL | SSTL Exceeded ? | Required CRF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | On-site (0 m) | Off-site 1 (0 m) | Off-site 2 (0 m) | On-site (0 m) | Off-site 1 (5 m) | Off-site 2 (0 m) | On-site (0 m) | On-site (0 m) | | Off-site 1 (5 m) | Off-site 2 (0 m) | On-site (0 m) | | | | Only if "yes" left |
| CAS No. | Name | (mg/kg) | None | None | None | Residential | Residential | None | Residential | Residential | Construction Worker | Residential | None | Residential | Construction Worker | (mg/kg) | "■" if yes | |
| 7440-38-2 | Arsenic | 2.9E+1 | | | | >1.0E+6 | >1.0E+6 | | >1.0E+6 | 5.7E+5 | | 5.7E+5 | | 5.7E+5 | 1.0E+6 | 5.7E+5 | ☐ | <1 |
| 7439-97-6 | Mercury | 3.4E-1 | | | | 1.5E+2 | 9.5E+2 | | 1.0E+2 | 5.9E+1 | | 5.9E+1 | | 5.9E+1 | 1.1E+2 | 5.9E+1 | ☐ | <1 |
| 7440-66-6 | Zinc | 7.0E+2 | | | | Tox? | Tox? | | Tox? | Tox? | | Tox? | | (Inh)Tox? | (Inh)Tox? | NC | ☐ | NA |
| 7439-92-1 | Lead (inorganic) | 3.9E+2 | | | | Tox? | Tox? | | Tox? | Tox? | | Tox? | | (Inh)Tox? | (Inh)Tox? | NC | ☐ | NA |
| T-al2134 | TPH - Aliph >C21-C34 | 1.5E+2 | | | | Tox? | Tox? | | Tox? | Tox? | | Tox? | | (Inh)Tox? | (Inh)Tox? | NC | ☐ | NA |
| T-ar2134 | TPH - Arom >C21-C35 | 1.4E+2 | | | | Tox? | Tox? | | Tox? | Tox? | | Tox? | | (Inh)Tox? | (Inh)Tox? | NC | ☐ | NA |
| 75-01-4 | Vinyl chloride | 1.1E-3 | | | | 6.9E-1 | 4.4E+0 | | 4.4E-1 | 1.7E+1 | | 1.7E+1 | | 1.7E+1 | 7.1E+2 | 4.4E-1 | ☐ | <1 |
| 156-59-2 | Dichloroethylene, cis-1,2- | 1.7E-3 | | | | 8.4E+2 | 5.3E+3 | | 6.1E+2 | 2.0E+3 | | 2.0E+3 | | 2.0E+3 | 3.9E+3 | 6.1E+2 | ☐ | <1 |
| NA | Total TPH mixture | 2.9E+2 | NA | NA | NA | NC | NC | NA | NC | NC | NA | NC | NA | #DIV/0! | #DIV/0! | #DIV/0! | ☐ | NA |

* = Chemical with user-specified data

">" indicates risk-based target concentration greater than constituent residual saturation value. NA = Not applicable. NC = Not calculated.

## RBCA SITE ASSESSMENT

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe
Date Completed: 29.08.18
Job ID:



### SUBSURFACE SOIL (1 - 7.6 m) SSTL VALUES

Target Risk (Class A & B) 1.0E-5
Target Hazard Quotient 1.0E+0

Groundwater DAF Option: Domenico - No Decay (One-directional vert. dispersion)

**SSTL Results For Complete Exposure Pathways (Checked if Pathway is Complete)**

| | | | o Soil Leaching to Groundwater Ingestion / Discharge to Surface Water | | | n Soil Leaching to Groundwater/ Groundwater Volatilization to Indoor Air | | | n Soil Vol. to Indoor Air | n Soil Volatilization to Outdoor Air | | | Applicable SSTL | SSTL Exceeded ? | Required CRF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CONSTITUENTS OF CONCERN** | | **Representative Concentration** | On-site (0 m) | Off-site 1 (0 m) | Off-site 2 (0 m) | On-site (0 m) | Off-site 1 (5 m) | Off-site 2 (0 m) | On-site (0 m) | On-site (0 m) | Off-site 1 (5 m) | Off-site 2 (0 m) | | | Only if "yes" left |
| **CAS No.** | **Name** | (mg/kg) | None | None | None | Residential | Residential | None | Residential | Residential | Residential | None | (mg/kg) | "■" if yes | |
| 7440-38-2 | Arsenic | 2.9E+1 | | | | >1.0E+6 | >1.0E+6 | | >1.0E+6 | 5.7E+5 | 5.7E+5 | | 5.7E+5 | ☐ | <1 |
| 7439-97-6 | Mercury | 3.4E-1 | | | | 1.5E+2 | 9.5E+2 | | 1.0E+2 | 3.7E+2 | 3.7E+2 | | 1.0E+2 | ☐ | <1 |
| 7440-66-6 | Zinc | 7.0E+2 | | | | Tox? | Tox? | | Tox? | Tox? | Tox? | | NC | ☐ | |
| 7439-92-1 | Lead (inorganic) | 3.9E+2 | | | | Tox? | Tox? | | Tox? | Tox? | Tox? | | NC | ☐ | |
| T-al2134 | TPH - Aliph >C21-C34 | 1.5E+2 | | | | Tox? | Tox? | | Tox? | Tox? | Tox? | | NC | ☐ | |
| T-ar2134 | TPH - Arom >C21-C35 | 1.4E+2 | | | | Tox? | Tox? | | Tox? | Tox? | Tox? | | NC | ☐ | |
| 75-01-4 | Vinyl chloride | 1.1E-3 | | | | 6.9E-1 | 4.4E+0 | | 4.4E-1 | 1.7E+1 | 1.7E+1 | | 4.4E-1 | ☐ | <1 |
| 156-59-2 | Dichloroethylene, cis-1,2- | 1.7E-3 | | | | 8.4E+2 | 5.3E+3 | | 6.1E+2 | 2.1E+3 | 2.1E+3 | | 6.1E+2 | ☐ | <1 |
| NA | Total TPH mixture | 2.9E+2 | NA | NA | NA | NC | NC | NA | NC | NC | NC | NA | NC | ☐ | NA |

* = Chemical with user-specified data

">" indicates risk-based target concentration greater than constituent residual saturation value. NA = Not applicable. NC = Not calculated.

**RBCA SITE ASSESSMENT** | **Cumulative Risk Worksheet**

Site Name: Barnageeragh Landfill | Completed By: P.McCabe | Job ID:

Site Location: Skerries, Co. Dublin | Date Completed: 29.08.18



## CUMULATIVE RISK WORKSHEET

| CONSTITUENTS OF CONCERN | | Representative Concentration | | Proposed CRF | | Resultant Target Concentration | |
|---|---|---|---|---|---|---|---|
| CAS No. | Name | Soil (mg/kg) | Groundwater (mg/L) | Soil | GW | Soil (mg/kg) | Groundwater (mg/L) |
| 7440-38-2 | Arsenic | 2.9E+1 | | NA | NA | 2.9E+1 | |
| 7439-97-6 | Mercury | 3.4E-1 | | NA | NA | 3.4E-1 | |
| 7440-66-6 | Zinc | 7.0E+2 | | NA | NA | 7.0E+2 | |
| 7439-92-1 | Lead (inorganic) | 3.9E+2 | | NA | NA | 3.9E+2 | |
| T-al2134 | TPH - Aliph >C21-C34 | 1.5E+2 | | NA | NA | 1.5E+2 | |
| T-ar2134 | TPH - Arom >C21-C35 | 1.4E+2 | | NA | NA | 1.4E+2 | |
| 75-01-4 | Vinyl chloride | 1.1E-3 | | NA | NA | 1.1E-3 | |
| 156-59-2 | Dichloroethylene, cis-1,2- | 1.7E-3 | | NA | NA | 1.7E-3 | |

***Cumulative Values:***

**RBCA SITE ASSESSMENT** | **Cumulative Risk Worksheet**

Site Name: Barnageeragh Landfill | Completed By: P.McCabe | Job ID:

Site Location: Skerries, Co. Dublin | Date Completed: 29.08.18



## CUMULATIVE RISK WORKSHEET

Cumulative Target Risk: 1.0E-5 Target Hazard Index: 1.0E+0

### ON-SITE RECEPTORS

| CONSTITUENTS OF CONCERN | | Outdoor Air Exposure: Residential | | Indoor Air Exposure: Residential | | Soil Exposure: Res./Constr. | | Groundwater Exposure: None | |
|---|---|---|---|---|---|---|---|---|---|
| | | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 |
| **CAS No.** | **Name** | Carcinogenic Risk | Hazard Quotient | Carcinogenic Risk | Hazard Quotient | Carcinogenic Risk | Hazard Quotient | Carcinogenic Risk | Hazard Quotient |
| 7440-38-2 | Arsenic | 5.1E-10 | Tox? | 0.0E+0 | | 0.0E+0 | 0.0E+0 | | |
| 7439-97-6 | Mercury | | 9.4E-4 | | 3.3E-3 | | 0.0E+0 | | |
| 7440-66-6 | Zinc | | Tox? | | | | 0.0E+0 | | |
| 7439-92-1 | Lead (inorganic) | | Tox? | | | | Tox? | | |
| T-al2134 | TPH - Aliph >C21-C34 | | Tox? | | | | 0.0E+0 | | |
| T-ar2134 | TPH - Arom >C21-C35 | | Tox? | | | | 0.0E+0 | | |
| 75-01-4 | Vinyl chloride | 6.3E-10 | 2.9E-6 | 2.4E-8 | 1.1E-4 | 0.0E+0 | 0.0E+0 | | |
| 156-59-2 | Dichloroethylene, cis-1,2- | | 8.0E-7 | | 2.8E-6 | | 0.0E+0 | | |
| ***Cumulative Values:*** | | **1.1E-9** | **9.4E-4** | **2.4E-8** | **3.4E-3** | **0.0E+0** | **0.0E+0** | **0.0E+0** | **0.0E+0** |

■ indicates risk level exceeding target risk

**RBCA SITE ASSESSMENT** | **Cumulative Risk Worksheet**

Site Name: Barnageeragh Landfill | Completed By: P.McCabe | Job ID:

Site Location: Skerries, Co. Dublin | Date Completed: 29.08.18



## CUMULATIVE RISK WORKSHEET

Cumulative Target Risk: 1.0E-5 Target Hazard Index: 1.0E+0

**OFF-SITE RECEPTORS**

| CONSTITUENTS OF CONCERN | | Outdoor Air Exposure: | | | | Indoor Air Exposure: | | | | Groundwater Exposure: | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Residential (5 m) | | None | | Residential (5 m) | | None | | None (0 m) | | None (0 m) | |
| | | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 | Target Risk: 1.0E-5 | Target HQ: 1.0E+0 |
| **CAS No.** | **Name** | Carcinogenic Risk | Hazard Quotient | Carcinogenic Risk | Hazard Quotient | Carcinogenic Risk | Hazard Quotient | Carcinogenic Risk | Hazard Quotient | Carcinogenic Risk | Hazard Quotient | Carcinogenic Risk | Hazard Quotient |
| 7440-38-2 | Arsenic | 5.1E-10 | Tox? | | | 0.0E+0 | | | | | | | |
| 7439-97-6 | Mercury | | 9.4E-4 | | | | 3.6E-4 | | | | | | |
| 7440-66-6 | Zinc | | Tox? | | | | | | | | | | |
| 7439-92-1 | Lead (inorganic) | | Tox? | | | | | | | | | | |
| T-al2134 | TPH - Aliph >C21-C34 | | Tox? | | | | | | | | | | |
| T-ar2134 | TPH - Arom >C21-C35 | | Tox? | | | | | | | | | | |
| 75-01-4 | Vinyl chloride | 6.3E-10 | 2.9E-6 | | | 2.5E-9 | 1.1E-5 | | | | | | |
| 156-59-2 | Dichloroethylene, cis-1,2- | | 8.0E-7 | | | | 3.2E-7 | | | | | | |
| ***Cumulative Values:*** | | **1.1E-9** | **9.4E-4** | **0.0E+0** | **0.0E+0** | **2.5E-9** | **3.7E-4** | **0.0E+0** | **0.0E+0** | **0.0E+0** | **0.0E+0** | **0.0E+0** | **0.0E+0** |

▲ indicates risk level exceeding target risk

indicates risk level exceeding target risk

# PEER REVIEW OF GAS AND VAPOUR RISK TO HOUSES, AND GROUNDWATER AT BARNAGEERAGH DEVELOPMENT, TOM PARKER, ARGENTUM FOX, 25TH FEBRUARY 2019



MULROY environmental

Argentum Fox

**Attention:** **Padraic Mulroy**
Managing Director

25th February 2019
AF7051

Mulroy Environmental
30 Lisroland View
Knockbridge
Dundalk
County Louth
Eire

Dear Padraic

## Peer Review of gas and vapour risk to houses, and groundwater at Barnageeragh development

Argentum Fox is pleased to provide an independent peer review of work associated with gas, vapour and groundwater issues and the historic waste deposit at the above-mentioned site.



## Background understanding

An historical waste deposit is present to the south of the new houses on-site. Extensive field work and subsequent assessment of the environmental data has been undertaken on both the waste deposit and houses themselves up to and including January 2019. Mulroy Environmental need to assess the robustness of their conclusions with respect to potential gas and vapour intrusion into the houses and potential impact to groundwater and surface waters.

## Reports reviewed

Reports reviewed in detail:

A. Phase II Site Investigation/GQRA & Landfill Gas Survey, Interim Gas Monitoring Report, 2nd July 2018. Report 308-1
B. RBCA model file 'RBCA with Soil VOC data29.08.18.xlsx'
C. Detailed Quantitative Risk Assessment of Barnageeragh Cove Landfill Rev D. Response to Queries Plus Preferred Cap Design, Prepared by: Peter Conroy, January 2019
D. Gas data up to and including 21.1.2019 Skerries Residential Gas Monitoring Results.pdf, 21.1.2019 Skerries Borehole Gas Monitoring Results.pdf
E. Historic Landfill Skerries - Prelim Technical Proposal for Capping DRAFT AGL (7 12 2018) (003).pdf

Reports read for background information but not peer-reviewed:

**Argentum Fox Ltd**
Director: Tom Parker
Registered Office: The Wilderness, Gold St, Walgrave, Northampton, NN6 9QE
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Registered in England & Wales No. 8254215.

1. Phase II Site Investigation/GQRA & Landfill Gas Survey, Interim Report. 277.29.08.17. 29th August 2017. Mulroy Environmental.
2. AGL17283_01. Report on The Geophysical Investigation at Barnageeragh Cove Landfill, Co. Dublin, 21st December 2017. Apex Geoservices Ltd
3. AGL18018_01. Report on the Phase 1 & Phase 2 Geophysical Investigation at Barnageeragh Cove Landfill, Co. Dublin. 09th February 2018. Apex Geoservices Ltd.
4. Occupational Monitoring of Headspace Air Within House No. 25, 26, 52 & 53 and Headspace Monitoring of Gas Well 1, Gas Well 2, Gas Well 3, and Gas Well 4 located in Barnageeragh Cove, Skerries, Co. Dublin. Performed by Odour Monitoring Ireland. 12th June 2018 Ver.4. Report Number: 2018014(4)
5. Occupational Monitoring of Headspace Air Within House No. 47, Barnageeragh Cove, Skerries, Co. Dublin. Performed by Odour Monitoring Ireland. 24th July 2018 Ver.1. Report Number: 2018356(1)
6. Phase II Site Investigation/DQRA & Landfill Gas Survey, Final Report 309-01. 31st August 2018. Mulroy Environmental.
7. Groundwater Results Borehole Sampling 17.07.18.xls
8. Draft Soil Results 13.03.18.xls
9. Email from RPS 'Interim Landfill Gas Monitoring Results (Ref 308-01) dated 2/7/18'. Mortimer Loftus to Padraic Mulroy
10. Gas Analysis of Headspace Air within gas sampling bag containing frost protection cap from House 26 and 52, Barnageeragh Cove, Skerries, Co. Dublin. OMI 31st January 2019
11. Phase II Site Investigation/DQRA & Landfill Gas Survey, Final Report 309-02. 31st January 2019. Mulroy Environmental.



## Conceptual Site Model

The conceptual model identified three key potential source-pathway-receptor linkages for the purposes of this peer review:

A. Landfill gas potentially migrating from the former waste deposit through Made Ground or silty gravelly SAND indigenous soil to the housing to the north of the waste mass;
B. Groundwater contaminated by the waste deposit flowing north from the waste mass with possible volatilisation into the unsaturated zone beneath the houses; and;
C. Contaminated groundwater flow north, northeast, and south from the waste deposit.

Contaminant linkages 'direct contact' and 'ingestion' associated with the deposited waste were assessed as incomplete by Report 1, noted above. This is a reasonable assessment since the waste deposit will be buried beneath a clean cover layer (Historic Landfill Skerries - Prelim Technical Proposal for Capping DRAFT AGL (7 12 2018) (003).pdf).

### Potential Linkage A – Landfill Gas

In terms of the potential source of landfill gas, the waste deposit and surrounding soils have been extensively characterised by 50 trial pits (Report 1), Geophysical investigation (Reports 2, and 3), and installation of 17 groundwater and gas and 4 shallow gas monitoring wells. At intrusive investigation locations, soil sampling has been undertaken to characterise the waste (Report 1). The monitoring wells (apart from the three installed in 2018) have subsequently been tested on a regular basis for nearly 18 months (Report D).

The lateral and vertical extent of the waste has been well constrained by geophysics and intrusive excavation. The waste composition has also been well constrained, with two predominant waste types identified (Report C). Most Total Organic Carbon (TOC) concentrations are below 3%, with some below 5% and occasional detections above 5% (Report 1). This is a line of evidence that backs up visual observations from the trial pits and boreholes (Report1) that there is limited putrescible organic matter in the waste deposit from which to generate gas.

In the general conceptual model of landfill gas migration, gas is generated within the waste; it then a) pushes out the air that is entrained within the pore-spaces; and then b) moves along the path of least resistance via advection and/or diffusion to areas of low pressure and/or low concentration, respectively.

In monitoring rounds to date (Report D), the balance gas (inert nitrogen in the soil pore-spaces) is similar to atmospheric air concentrations in almost all wells, indicating that there is insufficient gas generation to push out the air entrained and diffusing into the unsaturated zone. This is another line of evidence that there is limited putrescible organic matter in the waste deposit from which to generate gas.



The only location where the balance gas concentration is less than atmospheric air is BH4. Even here the gas generation rate is not sufficient to remove all the gas diffusing into the subsurface, as it would in a normal landfill. The long term trends in gas composition in BH4 indicates the methane in BH4 is seasonal. In the summer months the putrescible material either dries out, reducing gas generation, or air can more easily diffuse into the subsurface reducing anaerobic degradation. In the winter months the waste material becomes wet and starts generating gas again, or the amount of air diffusing into the subsurface is reduced.

In a typical landfill gas migration investigation, wells would be placed within the waste and then within the pathway from the waste to the receptor. Only if gas was found in the pathway would receptor point monitoring be undertaken. This was the approach followed in Report A.

Wells BH1, BH2, BH3, BH5, BH6, and BH7 are placed within the waste mass. Gas generation is insufficient to remove the balance gas from the pore spaces within the waste, although at BH6 and BH7 there is a correlation with rising atmospheric pressure and decreasing methane. Landfill gas concentrations at old landfills typically increase after rainfall has sealed the ground surface, with gas subsequently accumulating before a low-pressure weather front passes over the landfill drawing out the gas. During periods of high pressure, the ground dries up and there is no driver for advective flow from the ground. Post venting well installation data

indicates that 7 of the 21 are very low risk (GS01-04, BH2, BH3 and BH5). The rest are 'low risk'

The most recent guidance following the CIRIA 665 Gas Screening Value (GSV) methodology as used in Report A is BS8485:2015 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'. This document suggests that a number of other factors need to be considered:

> *6.3.7.1 General*
> *The designation of GSV should be made by inspection of all the data based on the conceptual site model for the situation with the development's sub-structure and foundations in place.*
> *NOTE 1 Adopting a GSV based on Qhg calculated from peak flow measurements might result in a disproportionately high gas hazard prediction, and assignment of an over-precautionary CS.*
> *NOTE 2 Examples of how monitoring data is considered to derive a GSV are given in Annex E. Where a development is to be built directly on or very close to the source of gas, then the Qhg adopted as the site or zone GSV should be based on gas measurements of the source. For a development off-set from a source, an assessment of the degree of hazard reduction afforded by the pathway between the source and the receptor should be made.*
> *NOTE 3 If the source has been monitored and is at some distance off-set from the development, then selection of the GSV based on an application of the Qhg obtained from the source is inappropriate.*



The only gas generating source material with the ability to displace nitrogen and therefore migrate via advective flow appears to be at BH4, estimated to be some 40m from the nearest house. No assessment of the degree of hazard reduction afforded by the pathway has been made as per Note 2, which is a conservative, worst-case approach. An assessment of hazard reduction afforded by the uncovered sub-soil pathway, with gas free to vent to surface, could potentially lead to the downgrading of all the risk associated with all boreholes to 'very low'.

Wells have then been placed within the pathway between the waste deposit and the houses to the north to investigate gas migration within this potential pathway (GS1 – GS4, BH4, BH8 – BH17). Of the boreholes in this potential pathway, Gas Wells GS1 – GS4, closest to the houses to the north, have been assessed as very low risk both before and after passive venting wells were installed (Report A, Tables 4 and 6).

Monitoring wells BH4 (and BH9 in close proximity) occasionally contain pockets of gas, but have nevertheless been characterised as being low risk (Report A, Tables 4 and 6). As noted, BH4 is the only well were gas generation has pushed some of the gas out of the porespace (the balance gas concentration is less than atmospheric). As also noted, gas concentrations in this well reduced after the septic tank associated with the builder's yard was removed in December 2017. Close to BH4 and BH9, wells BH8, BH10, BH11, BH12 contained elevated methane concentrations initially, which subsequently decreased. In January 2019, wells BH1, BH4, BH6, BH7, and BH17 contained some methane.

Monitoring wells BH8, and BH10 – BH17 have generally been characterised as low risk on a worst-case basis, which use the highest concentrations and flows during the monitoring period.

It is worth emphasising that no gas screening values in any of the 18 boreholes were above the very low risk threshold of <0.07 Litres per hour. Gas screening values are based on concentration and gas flow, which are linked to gas generation and gas migration rates. The only reason that the 'very low risk' assessment has been increased to 'low risk' for some wells is that the additional 'concentration only' thresholds of 5.0% for carbon dioxide and/or 1.0% for methane have been exceeded in those wells. This is a conservative approach to account for potential occasions that have not been monitored when gas flows may have been higher.

The potential gas migration pathways to houses to the west (BH2 and BH5) and the wastewater treatment plant to the east (BH12, BH15 - BH17) have also been assessed as low risk by the current monitoring well network, even though these potential receptors are further from the waste deposit.

Even though the risk has been assessed as very low risk in pathway boreholes, further gas monitoring has been undertaken within the houses and utilities next the houses where gas may flow along preferential pathways such as the gravel surrounding the utilities. This receptor point monitoring is a further precautionary measure. The monitoring determined that methane was absent or present at trace* concentrations within the radon sumps and where the water supply entered the base of the house. Carbon dioxide, which is present in natural soils, was detected at trace* concentrations with one elevated reading of 1.2% on the 11th June 2018 (Table 2, Report A). These data support the findings of the risk assessment and indicate that risks posed by gas from the waste deposit are low.



*Trace Detections for the purposes of this section are defined as the detection limit of the instrument x 5. The accuracy of trace detections should not be relied upon, because they may be caused by factors such as background interference by moisture in the gas (the analyser will have been calibrated using dry gas), or instrument drift as the instrument has warmed up or been moved since the latest calibration. These factors will affect portable instruments measuring methane, carbon dioxide, carbon monoxide, hydrogen sulphide and volatile organic compounds by photo ionisation detection (PID).

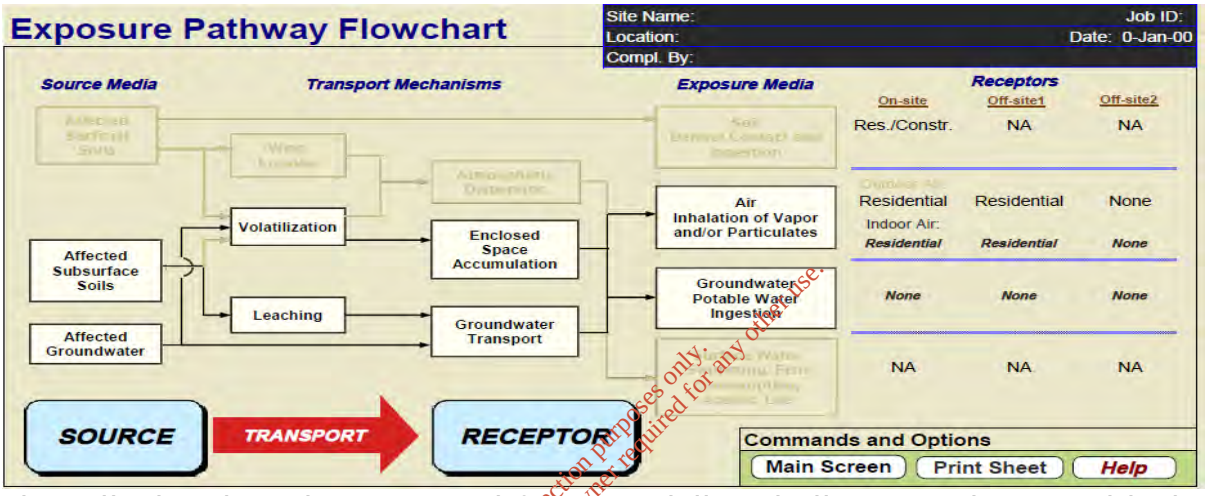
NOTE: Pre-field survey and post-field survey calibrations have been carried out on the GA5000 gas analyser using on-site calibration gas containing methane, carbon dioxide, sulphide and carbon monoxide. Similarly, pre and post sampling calibration of the PID has been done using isobutylene. Calibration records have been saved and are available for scrutiny.

### Potential Linkage B – Contaminant Volatilisation from Soil or Groundwater

A total of 35 groundwater samples have been taken across three monitoring rounds (Report 5) from 14 groundwater monitoring wells. No VOCs were detected within the groundwater above the method detection limit in any of these samples. The potential pathway of volatilisation from tested groundwater into the houses is therefore incomplete.

Five soil samples were analysed for VOCs. Only two VOCs, namely vinyl chloride and 1,2-dichloroethane were detected in one soil sample (SO-TP21-01). It should be noted that this sample was taken from a trial pit located 51m from the nearest residence.

Regardless of the lack of detections of VOCs in groundwater, there is a possibility that the detected concentrations of mercury and volatile organic compounds could a) volatilise into outdoor or indoor air, or b) dissolve in groundwater, then volatilise into outdoor air or indoor air downgradient. To asses this pathway, the Risk Based Corrective Action model (RBCA) was used to assess whether the soil detections pose any risk to receptors indoors or outdoors.




The soils data have been entered for potentially volatile contaminants, with the input data summarised below. Note that the model, as a conservative assumption, assigns non-detect results the value of half the detection limit for the purposes of the statistical assessment.



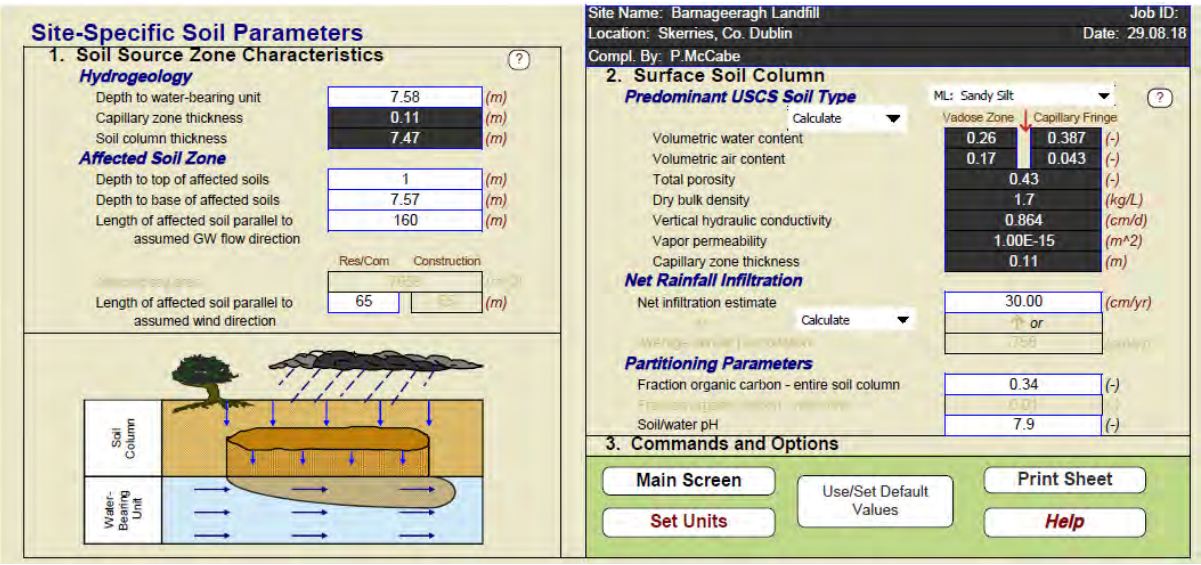
**RBCA SITE ASSESSMENT**

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe
Date Completed: 29.08.18
1 of 1

**TIER 2 SOIL CONCENTRATION DATA SUMMARY**

| CONSTITUENTS DETECTED | | Analytical Method | | | Detected Concentrations | | |
|---|---|---|---|---|---|---|---|
| CAS No. | Name | Typical Detection Limit (mg/kg) | No. of Samples | No. of Detects | Maximum Conc. (mg/kg) | Mean Conc. (mg/kg) | UCL on Mean Conc. (mg/kg) |
| 7440-38-2 | Arsenic | 2.0E+00 | 39 | 39 | 6.1E+01 | 2.6E+01 | 2.9E+01 |
| 7439-97-6 | Mercury | 1.0E-01 | 39 | 39 | 8.0E-01 | 2.9E-01 | 3.4E-01 |
| 7440-66-6 | Zinc | 2.0E+00 | 39 | 39 | 3.6E+03 | 5.3E+02 | 7.0E+02 |
| 7439-92-1 | Lead (inorganic) | 2.0E+00 | 39 | 39 | 1.7E+03 | 2.9E+02 | 3.9E+02 |
| T-al2134 | TPH - Aliph >C21-C34 | 1.0E+00 | 39 | 39 | 8.1E+02 | 9.8E+01 | 1.5E+02 |
| T-ar2134 | TPH - Arom >C21-C35 | 1.0E+00 | 39 | 39 | 1.2E+03 | 8.0E+01 | 1.4E+02 |
| 75-01-4 | Vinyl chloride | 1.0E-03 | 39 | 39 | 2.1E-03 | 1.0E-03 | 1.1E-03 |

Using default parameters for residential end-use, outdoor air concentrations above the waste deposit and indoor air concentrations 5m from the waste deposit were modelled as worst-case assumptions. The soil parameters modelled were for a sandy silt, which is a reasonable assumption given the silty gravelly SAND indigenous soils.




The calculated risk from all exposure pathways in the RBCA model is then assessed in comparison with a Hazard Index (HI). Anything over a HI of 1 requires further assessment or mitigation. The results of the RBCA model adding up all of the exposure pathways indicate the HI is over two orders of magnitude lower i.e., 100 times less, than a HI of 1.

**RBCA SITE ASSESSMENT** — **Baseline Risk Summary-All Pathways**

Site Name: Barnageeragh Landfill
Site Location: Skerries, Co. Dublin
Completed By: P.McCabe
Date Completed: 29.08.18
1 of 1

**BASELINE RISK SUMMARY TABLE**

| EXPOSURE PATHWAY | BASELINE CARCINOGENIC RISK: Individual COC Risk Maximum Value | Individual COC Risk Target Risk | Cumulative COC Risk Total Value | Cumulative COC Risk Target Risk | Risk Limit(s) Exceeded? | BASELINE TOXIC EFFECTS: Hazard Quotient Maximum Value | Hazard Quotient Applicable Limit | Hazard Index Total Value | Hazard Index Applicable Limit | Toxicity Limit(s) Exceeded? |
|---|---|---|---|---|---|---|---|---|---|---|
| ***OUTDOOR AIR EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ▯ | 6.3E-10 | 1.0E-5 | 6.3E-10 | 1.0E-5 | ▯ | 9.4E-4 | 1.0E+0 | 9.4E-4 | 1.0E+0 | ▯ |
| ***INDOOR AIR EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ▯ | 2.4E-8 | 1.0E-5 | 2.4E-8 | 1.0E-5 | ▯ | 3.3E-3 | 1.0E+0 | 3.4E-3 | 1.0E+0 | ▯ |
| ***SOIL EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ▯ | 6.5E-7 | 1.0E-5 | 6.5E-7 | 1.0E-5 | ▯ | NC | 1.0E+0 | NC | 1.0E+0 | ▯ |
| ***GROUNDWATER EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ▯ | NA | NA | NA | NA | ▯ | NA | NA | NA | NA | ▯ |
| ***SURFACE WATER EXPOSURE PATHWAYS*** | | | | | | | | | | |
| ▯ | NA | NA | NA | NA | ▯ | NA | NA | NA | NA | ▯ |
| CRITICAL EXPOSURE PATHWAY (Maximum Values From Complete Pathways) | | | | | | | | | | |
| | ***6.5E-7*** | ***1.0E-5*** | ***6.5E-7*** | ***1.0E-5*** | ▯ | ***3.3E-3*** | ***1.0E+0*** | ***3.4E-3*** | ***1.0E+0*** | ▯ |
| | ***Soil*** | | ***Soil*** | | | ***Indoor Air*** | | ***Indoor Air*** | | |



As a further precautionary approach, receptor point monitoring has been undertaken by two organisations. A general screen for Volatile Organic Compounds (VOCs) has been done by Mulroy Environmental as part of the gas monitoring regime (Report A). In addition, Odour Monitoring Ireland has undertaken diffusive sampling to identify specific compounds in the new houses (Reports 4 & 5). Actual measurement is typically more robust than modelling.

In terms of VOC monitoring in source and pathway monitoring wells GS1 – GS4, after initial well installation and the August 2017 monitoring, there have been no above trace detection VOC measurements (Report A). Initial elevated readings have been interpreted to be due to plasticizers in the new well pipework. Notably, the VOC concentrations in BH4, the only well indicating some gas generation, were below detection limit.

There have been no detections of VOCs above trace concentrations (that may be related to moisture or instrument drift during operation) beneath the houses in the radon sumps and foul sewers. However, there have been some trace concentrations of VOCs measured within the radon sumps within the houses (on the 1st October 2018, 26th November 2018 and on the 3rd December 2018) which likely can be attributed to moisture or instrument drift during operation of the photo-ionisation detector. The VOCs detected during the indoor monitoring could easily be from materials used in house construction/interior decorating or ambient air (see discussion below). The detection of these VOCs do not indicate that there is a linkage between the waste body and the residences.

Report 4 identified a number of volatile compounds in air within the houses, although the compounds detected are also associated with paints glues and background vehicle emissions. There was a noticeable odour of paints, varnishes and glues in the houses, and evidence of rubber cement tubes on the ground. In addition, benzene and toluene were detected in the travel blanks at various times. Dichloromethane and other chlorinated compounds have been 'blank corrected' by the laboratory, which also suggests background contamination at the laboratory from these compounds. No tubing blanks from well samples or background ambient air samples were taken to determine other potential sources of background contamination.



Carbon tetrachloride and formaldehyde were detected in the headspace of the wells GS1 – GS4, along with benzene and toluene interpreted to be from background traffic related sources. Rubber solvent tubes were noticed on the ground in the vicinity of these wells. However, in the waste deposit soils, the only volatile organic compounds identified were cis-1,2-dichloroethene and vinyl chloride. Neither of these compounds were detected in the sorbent tubes/thermal desorption/capillary gas chromatography analysis conducted for GS01 – GS04, which is a further line of evidence to indicate that they are not migrating from the landfill towards the houses.

Report 5 also identified a number of volatile compounds in air within house number 47. This house is the furthest house from the waste deposit and provides an indication of background conditions - trace concentrations of volatile organic compounds are present in all the new houses.

Note that Environment Agency report P1-491 'Quantification of trace components in landfill gas'[1] noted that 'There are now sufficient data to demonstrate that mercury is not present in significant amounts and does not warrant inclusion on the main

[1] Quantification of trace components in landfill gas. R&D Technical Report P1-491/TR. Environment Agency December 2004. ISBN: 1 844 32397 8

priority list.' This was in relation to mercury within modern landfill gas. Gas from an older waste deposit such as found at this site would not be expected to be a significant source of volatile mercury compounds.

### Recent Residential Monitoring

As of January 2019, the indoor gas monitoring indicates that:

- All radon sumps were found to contain 0-0.1ppm methane with (i.e. 0.1-0.2ppm) carbon dioxide. So close to the detection limits, these detections are likely to be artefacts of the instrument due to moisture and temperature. Taken in combination with Volatile Organic Compounds (VOCs) not being detected (all readings at 0ppm), gas monitoring demonstrates an absence of landfill gas in the radon sumps beneath the houses.
- Water Mains Manholes (with Frost Protection Caps) contain no methane (0ppm), and typical background soil carbon dioxide concentrations. VOCs were detected in 19 of the 22 water mains manholes at concentrations varying from 0.5ppm to 80.4ppm during the most recent weekly round. This is interpreted to be due to the presence of the plastic insulation frost protection cap within each chamber, with this interpretation being verified by OMI[2].

### Email from RPS

*The following are a number of comments from RPS re. the gas monitoring report;*

- *While the Mulroy report has been read and it appears to be in order, there are no details in the drawing or the report on the passive gas vents installed so RPS don't know where they are in relation to the waste and the development.*
- *Main issue still relates to methane levels and the fact that they are still being recorded at between 5% and 15% v-v, which are the lower and upper explosive limits (LEL; UEL) of the gas. Furthermore, methane in BH4 and BH17 would seem to indicate a direct pathway from the waste body.*
- *Methane was also detected in the radon sump and the water metre (Section 1.3.19 and 1.3.20) which would indicate some connectivity. However, the levels are very low at the nearest boreholes so it would appear that, in terms of risk, it is very low risk.*
- *There are high levels of CO2 across the site over the monitoring period clearly showing that LFG is migrating from the waste body. RPS would have some concerns about the new boreholes BH15-17 showing high CO2 levels and the migration eastward, as there is a Waste Water Treatment Plant on that side.*
- *Continued and regular monitoring is required and additional passive vents should be considered around the perimeter of the waste body to provide a preferential flow path for the landfill gases.*



Updated Response:

1. With regard to the location of passive gas vents, these are located north of the waste deposit in the potential pathway between the waste deposit and the houses.
2. In terms of methane concentrations, in 2018, BH4 has consistently contained methane >5%. Overall, there have been 37 exceedances of 5% methane in other

[2] Gas Analysis of Headspace Air within gas sampling bag containing frost protection cap from House 26 and 52, Barnageeragh Cove, Skerries, Co. Dublin. OMI 31st January 2019

wells since June 2018. Fifteen of these have been in BH17 on the east of the site away from the housing, four from BH1, three have been in BH6, four from BH7, one from BH8, two from BH9, two from BH10, one from BH11 and five from BH12. The exceedances do not show an increasing trend in any well and appear to represent intermittent gas generation and/or surface sealing such that the generated gas cannot escape. Because risk is associated with both concentration and flow, the flow readings provide important context. The maximum recorded flow is 0.3 L/hr, which results in a 'low' or 'very low' risk, as per CIRIA 665. As discussed previously, gas generation is required to provide a pressure gradient to drive advective flow or diffusive flow that can overcome dilution by surface diffusion. The balance gas concentrations of inert nitrogen do not suggest significant gas generation, even in BH4.

3. Carbon dioxide is ubiquitous in the subsurface as the result of microbial respiration. Elevated concentrations (maximum >10%) of carbon dioxide are associated with wells within the waste deposit, but carbon dioxide concentrations are much reduced in locations away from the waste. For example, 0.3 – 4.3% in wells GS01 – GS04 in the pathway to the houses a few metres to a few 10's of metres away. Significant gas migration is therefore not indicated, consistent with the lack of gas generation significant to push out all the balance gas. The stream on the eastern site boundary (Report C) will provide a barrier to unsaturated zone gas flow to the east (BH15-17) and the water treatment plant, assuming such gas flow is actually occurring.
4. While continued monitoring would be good practice to ensure annual seasonal variation is understood in all wells, the lack of evidence for gas generation and gas migration suggests additional passive vents near the housing are not warranted. In order to avoid putting in a biocover/venting zone in the proximity of BH17 near the water treatment plant it is proposed that 1 - 2 passive gas venting wells are installed in this area to deal with the localised hotspot of gas generating waste in this area.



### Potential Linkage C Contaminated groundwater flow north, northeast, and south from the waste deposit

Report C uses the ConSim model to determine risks to groundwater and surface waters from the waste deposit. The conceptual model involves groundwater that intercepts the base of the waste flowing to the small stream that surrounds the site area to the south (south of the railway), east (along the eastern site boundary) and north (along the northern site boundary). There is interpreted to be some preferential flow to the east/north-east through a weathered bedrock layer beneath BH11 and BH12. Factors that suggest the modelling output is reasonable are:

- Aquifer properties have not been assumed, but rather obtained from field pumping tests. The assessment of pumping test data in the appendix is robust.
- The groundwater elevations have been assessed on three separate occasions to gain a robust understanding of the groundwater flow regime and seasonal variation.
- The waste deposit has been differentiated into two waste types, with chemical of concern identified for potential surface water receptors (groundwater is not abstracted for potable use in the area and will not be abstracted and used on-site - P.Mulroy, pers. Comm. 13th July, 2018).

- Where Total Petroleum Hydrocarbon fractions were identified, they have been assigned to worst-case indicator compounds for the purposes of risk assessment e.g., Naphthalene was modelled as an indicator of the mobile end of the EC>C10 to C12 range.
- The input parameters used in the modelling have been referenced, justified, and are reasonable.
- The receptors chosen are groundwater immediately downgradient of the waste deposit and surface water 5m from the waste deposit at the eastern boundary drain. These are conservative assumptions.
- The modelled groundwater flow has been checked against a mass balance calculation, with the modelled value being higher than the recharge value indicating the model results are conservative.
- A sensitivity analysis was done, with best case and worse case assumptions modelled for the key determinand (ammonia).
- The model representativeness has also been assessed by comparing predicted and measured ammonia and chloride concentrations at BH11. While not perfect, there appears to be a reasonable correlation.

Additional modelling has been done to establish whether or not a landfill cap is the best remediation option. This has shown that if an engineered landfill cap is installed over the landfill, contaminant concentrations in groundwater at downgradient receptors are predicted to be mitigated such that the contaminant concentrations do not result in breaches of the Groundwater or Surface Water Regulations. This includes a biowindow in the cover to allow oxygen to diffuse to material next to BH4 and allow any methane to be oxidised as it migrates to atmosphere.



Once a robust dataset of groundwater and surface water concentrations indicating the interaction between the two is obtained, if the surface water impact is limited, and the capping of the waste has reduced recharge and contaminated groundwater flow, then there should be limited reasons to continue monitoring.

### Waste Capping Design

The waste capping design has been reviewed. To prevent potential lateral migration after the capping has taken place, a recommendation (that has subsequently been adopted) was made to include a biowindow to be placed in the waste cap next to BH4. A biowindow is a permeable topsoil matrix that allows methane to be oxidised by natural methanotrophs within the soil as it vents to atmosphere. Oxidation can occur because the open structure topsoil matrix is permeable enough to allow air (oxygen) to diffuse into the subsurface. Oxygen diffusing into the subsurface will enhance degradation of any residual waste. Because the methane is oxidised to carbon dioxide as it travels to surface, there is no risk of methane build up in the subsurface. This prevents the possibility of lateral gas migration away from BH4, where gas generation occurs most regularly. Planting the biowindow with trees will maintain the open structure of the topsoil and further reduce infiltration of rainwater.

### Topsoil Placement

Topsoil stockpiled as a result of ground clearance works as part of the development to the south of the new football pitch has been used as a landscape medium around the site. This topsoil was used for landscaping on the northern end of the landfill (i.e. where Type 1 waste exists) and to the north of the landfill where the ground was undisturbed in the past (i.e. outside the sand and gravel pit and historic landfill). Composite samples of this topsoil, originally used for agricultural purposes, has been screened against generic assessment criteria for Public Open Space (residential) end-use. This is a suitable sampling and screening method for such a material. The assessment indicates that the topsoil is suitable for its intended Public Open Space (residential) end-use, with soil concentrations being well below the generic assessment criteria used for screening.

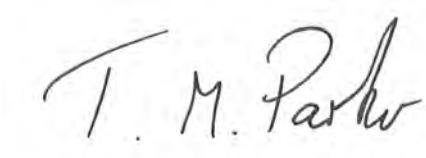
## Conclusions

1. The low and very low risks assigned to the potential landfill gas linkage in Report A and after subsequent monitoring rounds are correct and robust. There are now sufficient data to assess the effects of seasonal variation on the gas regime. A Check list for assessing the adequacy of a site investigation from BS 8485:2015 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings' is included as Appendix 1.
2. The interpretation that the waste deposit is not causing vapour migration into the houses is supported by a number of lines of evidence and is therefore robust. Modelling of soil contaminant fate and transport, the lack of volatile compound detections in groundwater, and indoor air monitoring in the houses themselves all suggest that compounds in the waste deposit are not migrating to the houses.
3. The volatile compounds detected from the water mains are from the plastic insulation frost protection covers and are not believed related to the historic waste. A report from OMI is pending.
4. Under current conditions contaminant migration via the groundwater pathway may result in elevated above background concentrations of ammonia, chloride, arsenic, c-1,2-Dichloroethene and naphthalene at downgradient receptors at varying times over the 1,000 year model period. Groundwater is not used for potable supply in the area (P.Mulroy, pers. Comm. 13th July, 2018). If an engineered landfill cap is installed over the landfill, contaminant concentrations in groundwater at downgradient receptors are predicted to be mitigated.
5. If the cap contains a biowindow adjacent to BH4, any gas generated at this location will not be able to build up in the subsurface and will not be able to migrate laterally. Any gas generated will be converted to carbon dioxide as it migrates to the surface.
6. Groundwater should be monitored and assessed after the waste deposit has been capped and infiltration reduced. Once a robust dataset is available, and if no significant impact is occurring, then further monitoring should not be required. If significant impact is occurring, then additional mitigation measures and monitoring will be required.
7. The topsoil placed to landscape the area to the north of the historic landfill is suitable for a Public Open Space (residential) end-use.

## CLOSURE

We trust the above proposal meets your requirements. We would be happy to discuss the details with you and incorporate any comments. If you have any questions, please contact the undersigned.

**ARGENTUM FOX**



Tom Parker, M.A., M.Sc., Eur.Geol., FGS. SiLC (SQP), ASoBRA (all four disciplines).
Director

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## Biography

Tom has 25 years of experience resolving brownfield and landfill operational and legacy issues. Tom has written papers on the migration of vapour into residential properties, the sustainability of landfills, and the profile of trace components of landfill gas over time. He has managed many landfill R&D projects including the prioritisation of trace components in landfill gas from a toxicity and odour perspective, from both biodegradable and hazardous waste. He has also developed gas scrubbing technology for landfill gas and biofilters for methane oxidation. He has written Industry Codes of Practice, for example, on 'Perimeter soil gas emissions criteria and associated management'. Recent landfill projects include gas abstraction and migration concerns at operating and closed landfills. Brownfield projects include assessing vapour intrusion at residential properties, supporting a Public Enquiry into a residential development on an old landfill, and project managing a portfolio of residential remediation projects.
Tom trained as a hydrogeologist, is a Chartered and European Geologist, a Specialist in Land Condition (SQP), and an Accredited Risk Assessor (all four disciplines).

**Appendix 1. Modified Table 1 Check list for assessing the adequacy of a site investigation. From BS 8485:2015, Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings**

| Aspect of the investigation | Questions that should be adequately answered | T. Parker view |
|---|---|---|
| Preliminary investigation | Has the preliminary investigation (desk study and site reconnaissance) been completed in accordance with BS 10175 and BS 8576?<br>Are there any information gaps that need to be filled? | **Yes**<br>**No** |
| Scope of the investigation | Has the investigation been sufficient in scope to:<br>• establish the geology and hydrogeology of the site;<br>• determine whether made ground and/or contamination is present; and<br>• identify source(s) and the nature of the mechanism of gas generation?<br>Has appropriate monitoring, sampling and analysis been carried out? | **Yes**<br>**Yes**<br>**Yes**<br>**Yes** |
| Geophysical techniques | Where appropriate, have geophysical/remote sensing techniques been used to help delineate the extent of landfill or made ground and the location of the methanogenic material? | **Yes** |
| Monitoring installations | Were the type and depth of monitoring installations and response zones adequate to identify on-site gas sources and migration pathways, and to determine whether receptors were likely to be impacted?<br>Are there sufficient monitoring installations to evaluate effects of off-site sources, where this is relevant? | **Yes**<br>**Yes** |
| Distribution of monitoring points | Were monitoring locations distributed such that sources, migration pathways and receptors can be adequately characterized? | **Yes** |
| Monitoring instrumentation | Were the instruments used to monitor gas appropriate, and properly maintained, calibrated, and operated? | **Yes** |
| Monitoring parameters | Is enough information regarding gas composition, concentrations, atmospheric and differential borehole pressures and flows available to characterize risk, and is there sufficient data concerning the factors that affect gas migration and emission to assess the likely variability of the gas regime?<br>Was the data accurately measured and reported? | **Yes**<br>**Yes to reported. Measurement accuracy not assessed** |
| Monitoring frequency | Was the frequency of monitoring sufficient to characterize the consistency or inconsistency of the gas regime over the monitoring period (see **5.3**)? | **Yes** |
| Monitoring period | Was the period of monitoring long enough to monitor changes in ambient conditions that influence gas generation and migration (see **5.4**)? | **Yes** |

# APPENDIX 16

DESKTOP STUDY

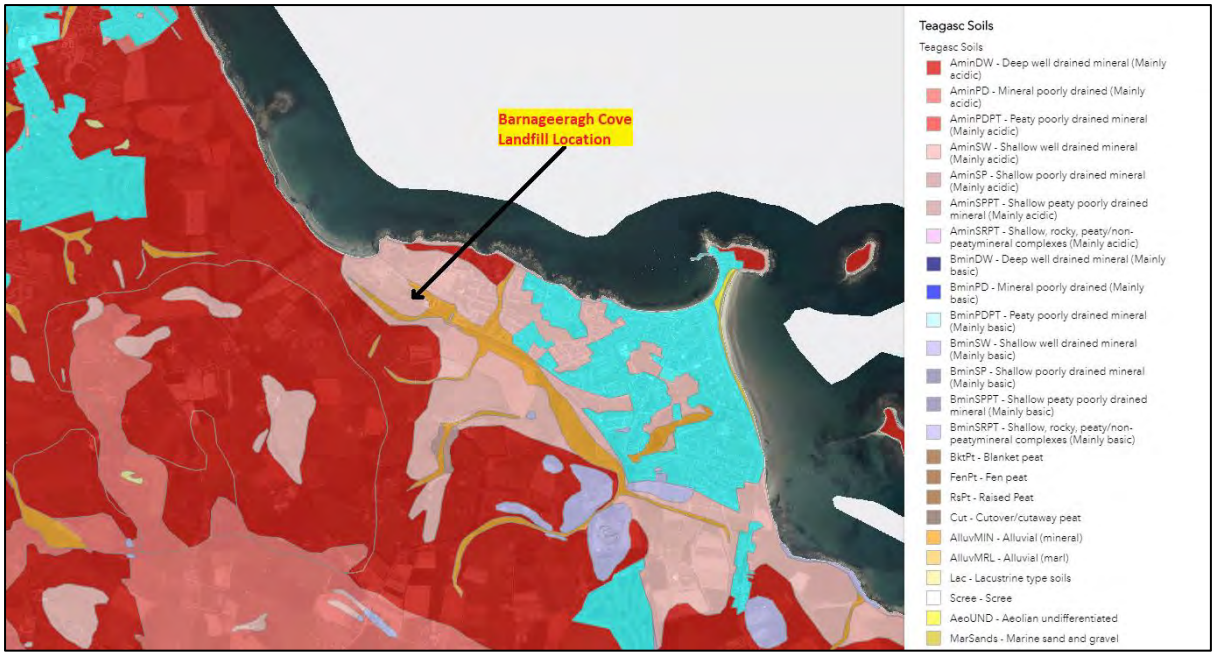


**Plate 1. TEAGASC Soils**



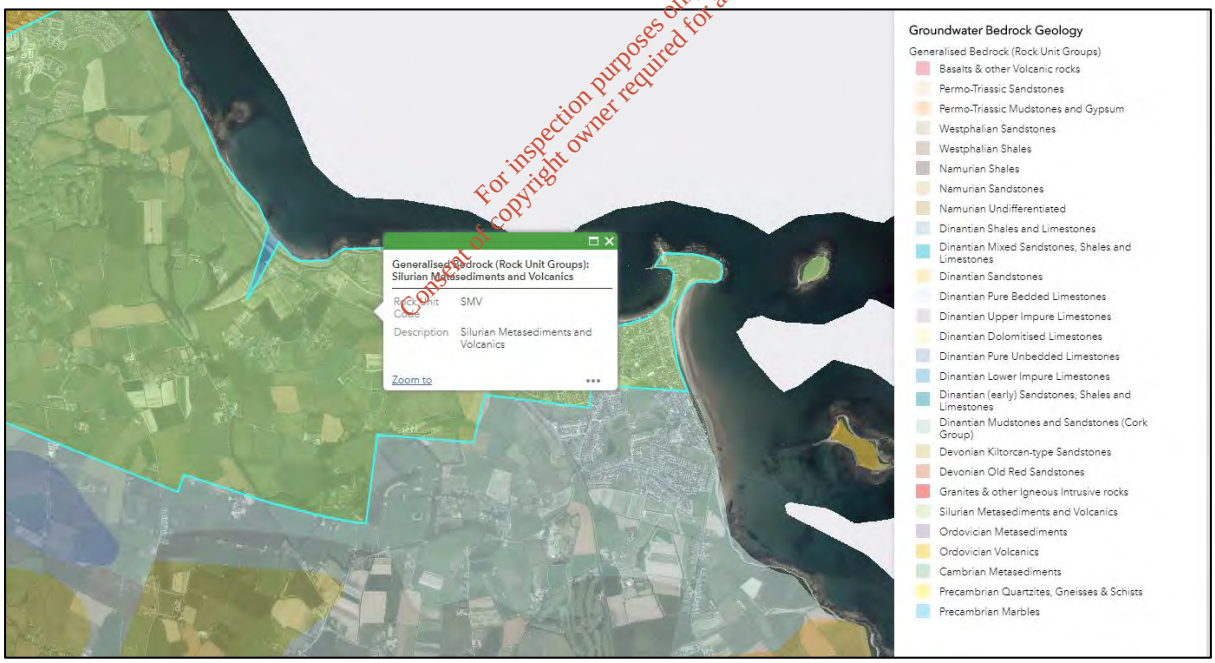


**Plate 2. GSI Rock Unit Group**


**Plate 3. GSI well record & springs**




**Plate 4. GSI geological heritage areas**


**Plate 5. GSI Source Protection areas**



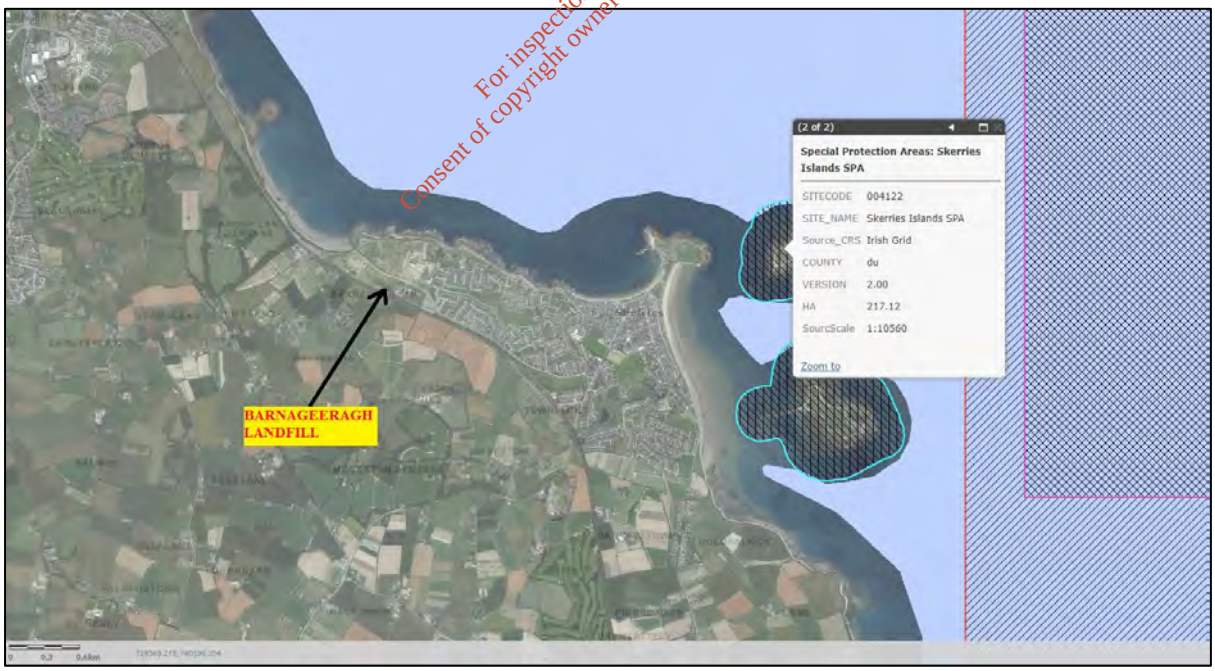


**Plate 6. Proximity to Skerries Islands**


**Plate 7. Proximity to Rockabill**

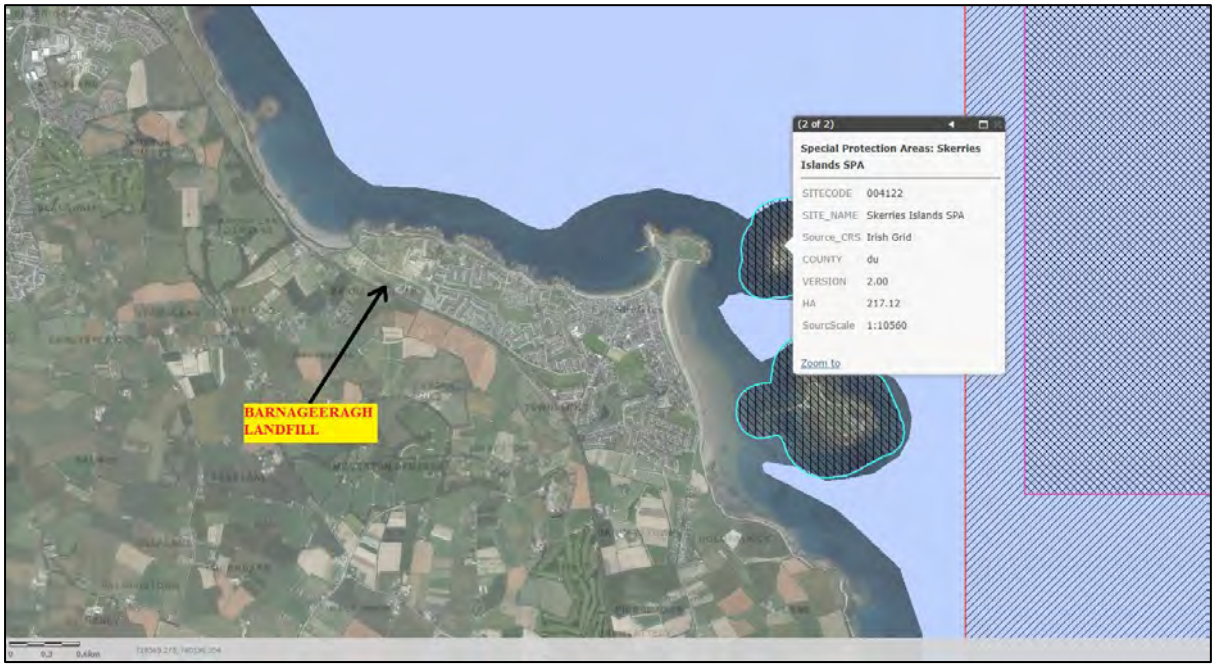


**Plate 1. Proximity to Skerries Islands**




**Plate 2. Proximity to Rockabill**

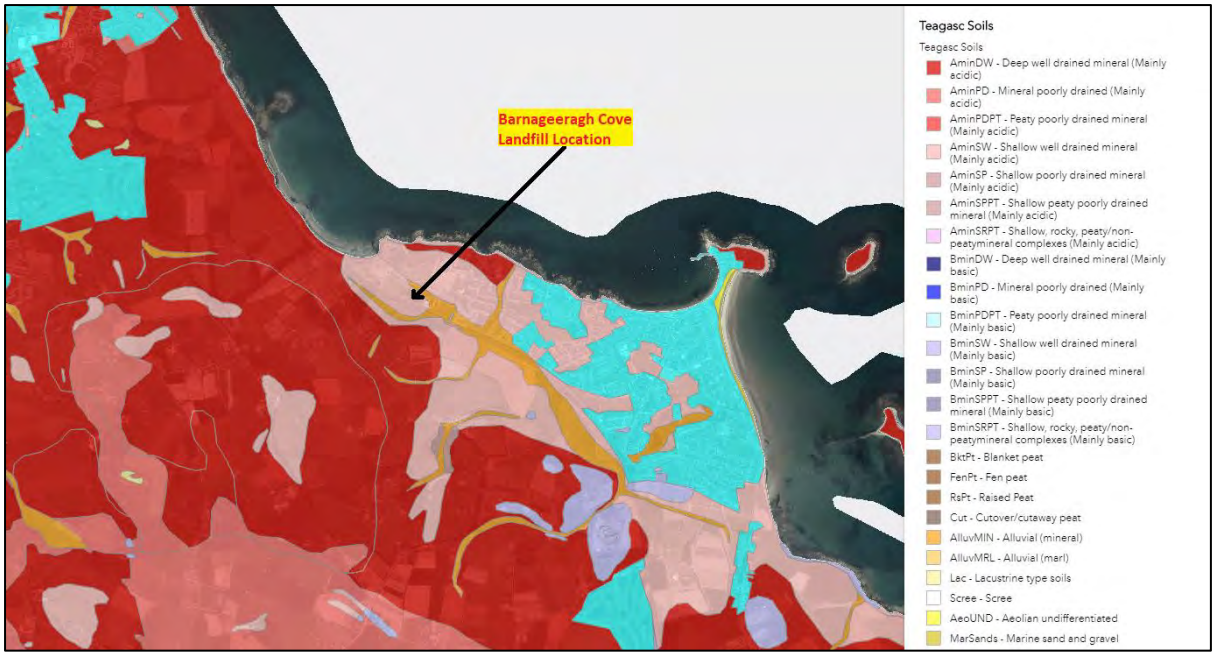


**Plate 3. TEAGASC Soils**




**Plate 4. GSI geological heritage areas**

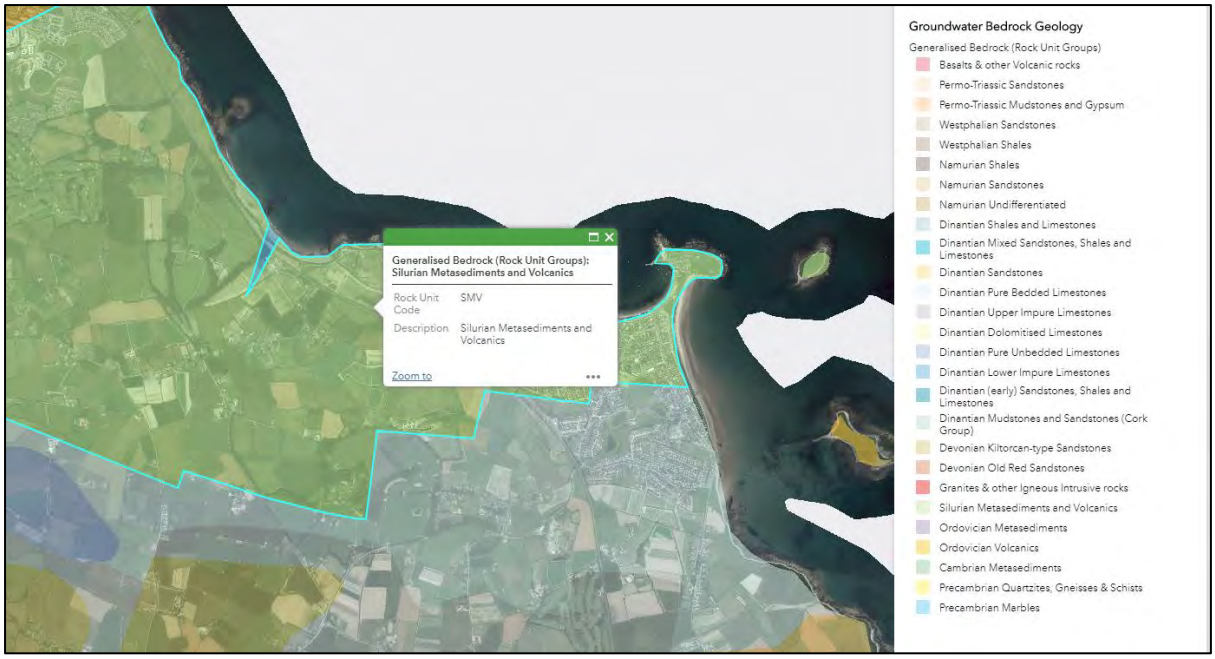


**Plate 5. GSI Rock Unit Group**




**Plate 6. GSI well record & springs**


**Plate 7. GSI Source Protection areas**

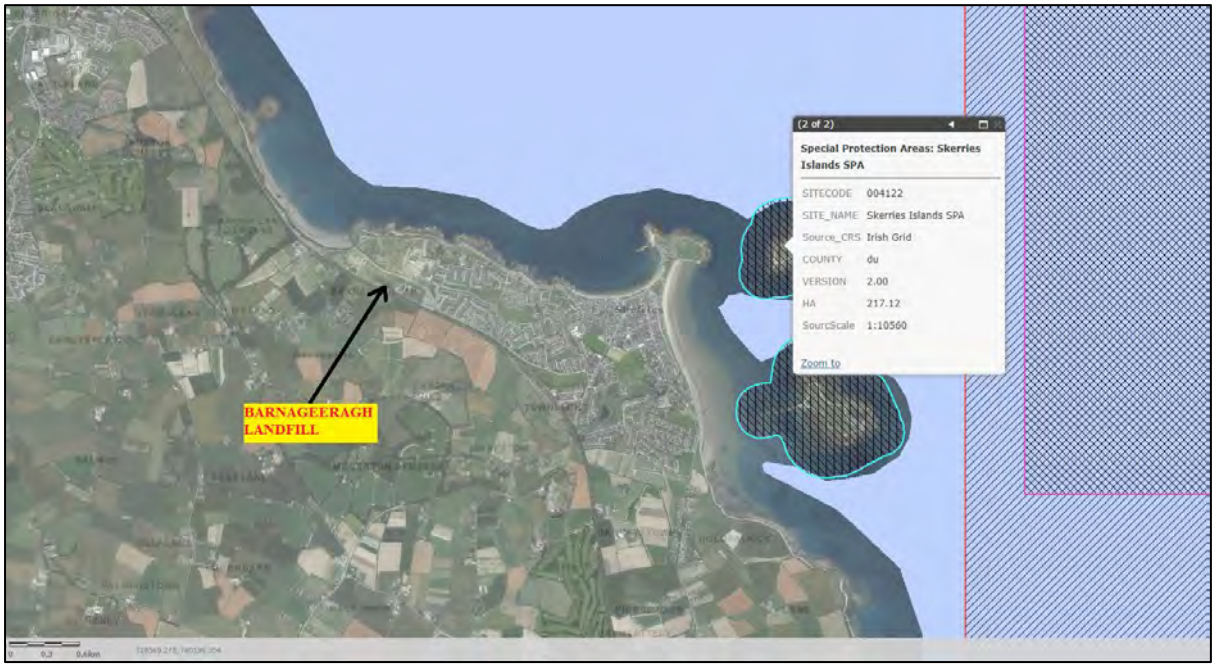


**Plate 1. Proximity to Skerries Islands**




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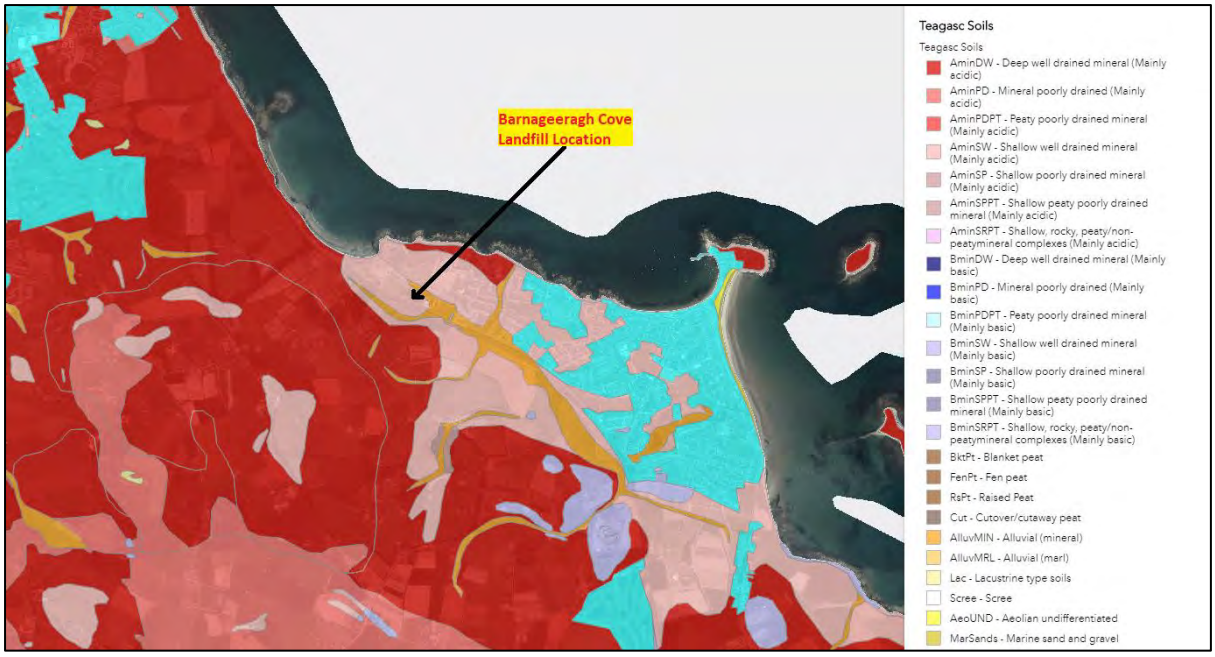


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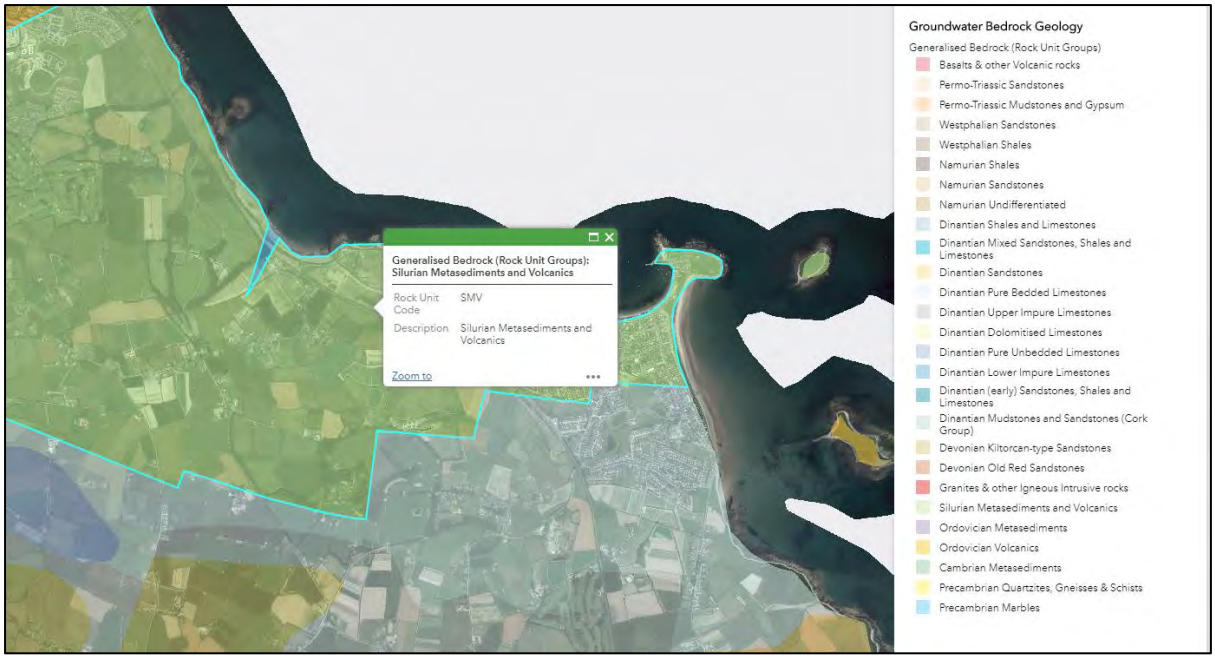


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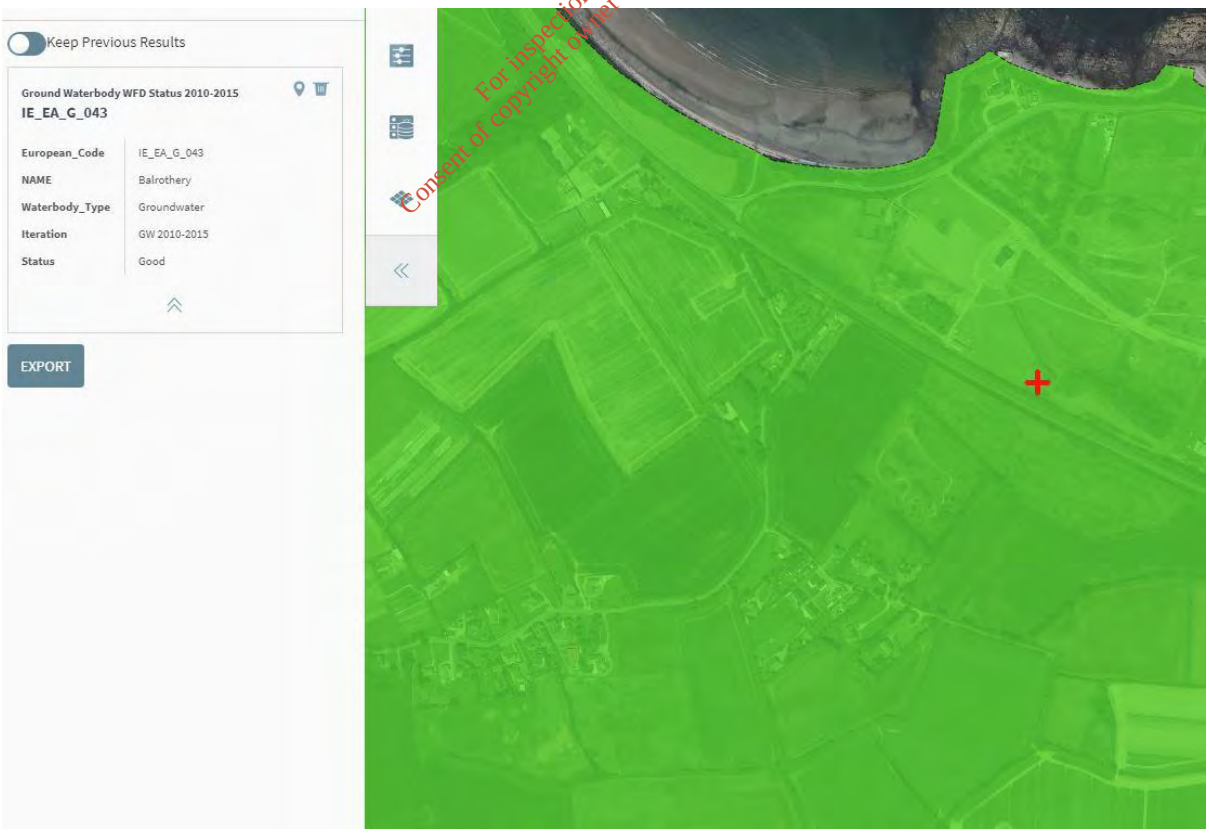



**Plate 8. Ground Waterbody WFD Status 2010 – 2015 (Balrothery 'Good' Status)**

# APPENDIX 17

SHELLFISH DESIGNATED AREAS

REVISED UPDATED REPORT 2012


# Map 31: Balbriggan/Skerries

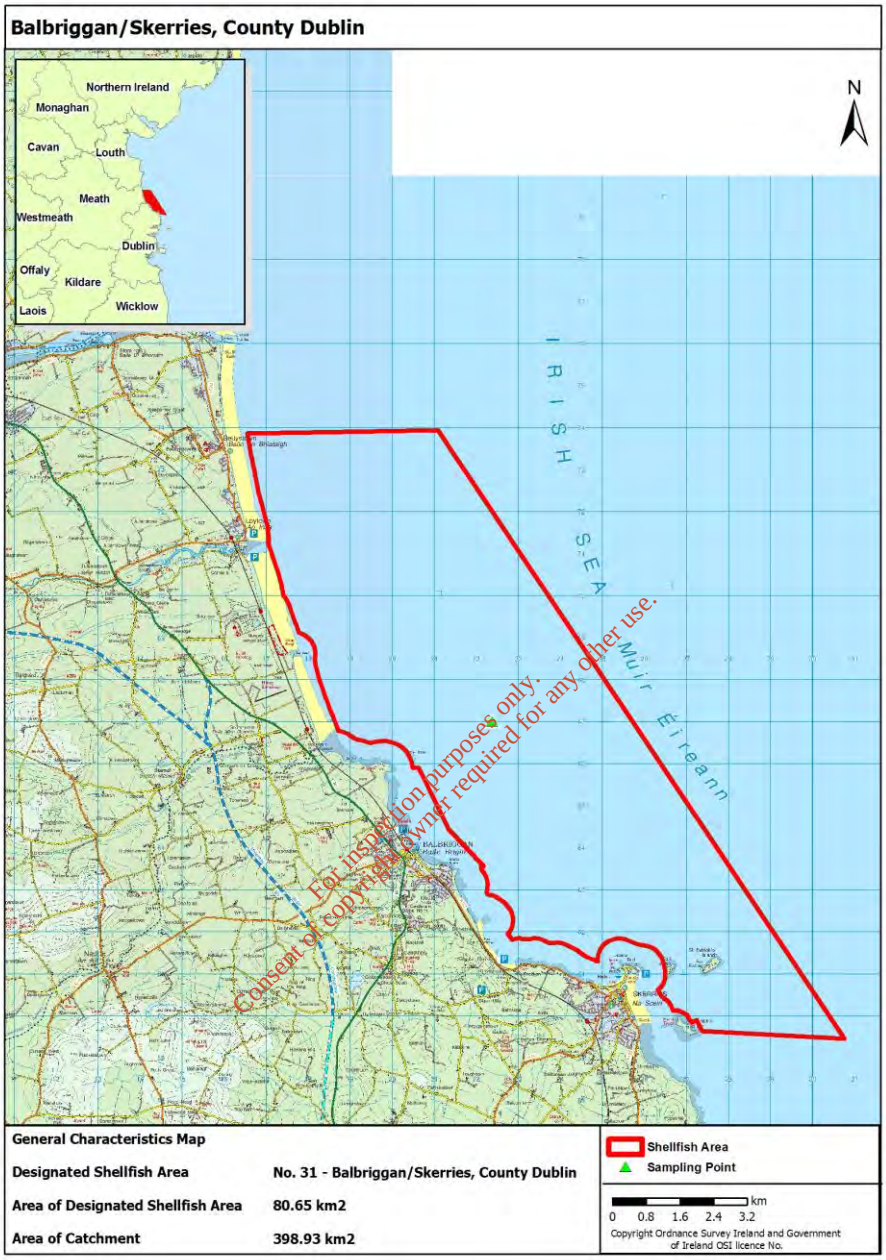
1:60,000

Designated Shellfish Water



Date: December 2008

# Revised / Updated
# Balbriggan/Skerries Pollution Reduction Programme






| Name | Balbriggan/Skerries Shellfish Area |
|---|---|
| Map number | 31 |
| Year of designation | 2009 |
| Area | 80.7 $km^2$ |
| River Basin District | Eastern RBD |
| County | Dublin |
| Location of sampling point | 53 deg 38.327 min North (Lat)<br>6 deg 9.035 min West (Long) |
| Catchment area | 398.93 $km^2$ |
| Catchment area within 20 km zone | 326.93 $km^2$ |

## 1.0 INTRODUCTION

### 1.1 Programme Objective

Compliance with the standards and objectives established by the Quality of Shellfish Waters Regulations 2006 (S.I. No. 268 of 2006) (as amended) for the designated shellfish growing waters at Balbriggan/Skerries and with Article 5 of Directive 2006/113/EC of the European parliament and of the Council on the quality required for shellfish waters.

### 1.2 Pollution Reduction Programme

This pollution reduction programme for the shellfish growing waters at Balbriggan/Skerries has been established by the Minister for the Environment, Community and Local Government in order to protect and improve water quality in the designated shellfish growing areas in Balbriggan/Skerries and in particular, to ensure compliance with the standards and objectives for these waters established by the 2006 Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) and with Article 5 of Directive 2006/113/EC of the European parliament and of the Council on the quality required for shellfish waters.

### 1.3 Supporting Characterisation Report and Toolkit of Measures

The Pollution Reduction Programme stems from the work undertaken in the characterisation report for Balbriggan/Skerries. The characterisation is designed to achieve the following:

- establish the catchment that influences the water quality of the designated area;
- identify the different types of pressures or impacts prevalent in the catchment;
- establish an initial assessment of the water quality within the catchment and within the designated shellfish area using all water quality data available;
- from the above three elements identify the pressures that are active in the catchment and subsequently impacting the water quality in the designated shellfish area;
- having identified the pressures impacting on the water quality the characterisation report prioritises them in relation to their impact.

The characterisation report thus provides a prioritised list of pressures/impacts/effects on water quality. The pollution reduction programme or action plan takes this prioritised list and addresses each issue with actions to help ensure that compliance with the relevant water quality standards is achieved or ensured.

The measures/actions included in this PRP to address the identified pressures on shellfish water quality in this catchment are based on a National Toolkit of Measures. The National Toolkit has been derived from earlier work carried out on the River Basin Management Plans under the Water Framework Directive (WFD), reflecting the common objective to improve water quality in the two Directives. In addition, designated shellfish waters are part of the WFD Register of Protected Areas, providing a further link between the Pollution Reduction Programmes and River Basin Management Planning.

Within each individual PRP specific measures from the National Toolkit are applied, where required, to address the key and secondary pressures identified in each of the designated shellfish waters.

### 1.4 Strategic Environmental Assessment and Habitats Directive Assessment

The Strategic Environmental Assessment (SEA) and Habitats Directive Assessment (HDA) processes were carried out in tandem with the PRP compilation process. These assessments both informed the development of alternatives considered for the PRP and included detailed high-level assessments highlighting the potential positive and negative impacts (including cumulative impacts) associated with application of the measures contained in the National Toolkit. In addition, a more focussed assessment was also carried out which considered the individual and cumulative impacts associated with implementation of the measures brought forward into this individual PRP.

As a result of the SEA and HDA assessments mitigation measures were identified in order to reduce potential negative impacts associated with implementation of the PRP. The relevant mitigation measures are included in Annex 2 of the PRP. The mitigation measures arising from the SEA are noted in black, while the mitigation measures arising from the HDA noted in blue.

### 1.5 Monitoring of Water Quality

The Marine Institute is carrying out a monitoring programme to monitor the condition of waters in the shellfish growing area and to verify compliance, or otherwise with the water quality standards outlined in Schedules 2 and 4 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) and summarised in Table 1 of the Characterisation Report (Chapter 1 of the Characterisation Report refers). The Marine Institute will submit a report on water quality in respect of the designated area to the Minister each year, and will immediately bring to the attention of the Department of the Environment, Community and Local Government any non-compliance with a water quality standard to enable investigation to be undertaken.



### 1.6 Review/monitoring of Pollution Reduction Programme

This pollution reduction programme will be kept under review by the Minister and will be updated and amended as needed from time to time, having regard to water quality conditions within the shellfish growing area including changes in water quality in response to the implementation of measures and other factors arising in the catchment that may affect water quality in the designated area.

The pollution reduction programme will be reviewed at intervals not exceeding three years and, where necessary, at lesser intervals if the monitoring data indicates a deterioration in water quality status or a risk that the objectives or standards laid down in the Regulations will not be achieved.

When the Pollution Reduction Programme is being reviewed the most current baseline data will be consulted.

Prior to the incorporation of the PRP into the second cycle of the River Basin Management Plans a review of the Strategic Environmental Objectives for Water will be carried out as against those drawn up for assessment of the first cycle River Basin Management Plans to ensure that the Shellfish PRP help to meet the wider Water Framework Directive water quality objectives.

### 1.7 Monitoring of Environmental Impacts

Article 10 of the SEA Directive requires that monitoring be carried out in order to identify at an early stage any unforeseen adverse effects due to implementation of the PRP, with the view to taking remedial action where adverse effects are identified through monitoring. An Environmental Monitoring Programme has been developed which focuses on aspects of the environment that are likely to be impacted by the PRPs. The Environmental Monitoring Programme is included in Table 5 of the National Toolkit of Measures. The Department of the Environment, Community and Local Government will be the authority responsible for collecting and collating data under the Environmental Monitoring Programme. The data will be collected at the same time the pollution reduction programme is reviewed.

### 1.8 Monitoring Implementation of Pollution Reduction Programme

This PRP is effectively a sub-basin plan of the River Basin Management Plan for the catchment and will be implemented during the first implementation cycle under the Water Framework Directive (i.e up to 2015).

Implementation of the pollution reduction programme will be monitored by Water Quality Section of the Department of the Environment, Community and Local Government.

The contact person is:

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### 2.0 STATUS/IMPACTS

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| Overall status | The results of monitoring (2009) undertaken for the purposes of the Shellfish Waters Directive (2006/113/EC) and Schedules 2 and 4 of the Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) indicated faecal contamination within / in the vicinity of this shellfish area.<br><br>The most up to date results of monitoring (2012) indicate that this area is not in compliance with the Guide Value of 300 faecal coliforms / 100ml.<br><br>The results of Shellfish Water Monitoring for Parameters 1 – 7 do not indicate any water quality issues within / in the vicinity of this shellfish area. However, no results for Parameters 8 & 9 reported.<br><br>Monitoring of shellfish flesh for food hygiene purposes (2012), indicates that there is no faecal contamination in this shellfish area. The bivalve mollusc production |

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| | areas in Balbriggan/Skerries are classified as 'Class A' for the purposes of EC Regulation 854/2004.<br><br>Chapter 3 of the Characterisation Report refers. |
| Other issues | None |
| **3.0 PRESSURES/RISKS** | |
| **3.1 Key Pressures** | Analysis of the Characterisation Report for this designated shellfish water suggests that the key pressures are urban wastewater systems and on-site waste water treatment systems.<br><br>Chapter 5 (summary at 5.3) of the Characterisation Report refers. |
| Urban waste water systems | Balbriggan/Skerries<br>See Annex 1 |
| On-site waste water treatment systems | There are approx. 6,500 on-site waste water treatment systems in this catchment and their density is higher than the national average. The characterisation report indicates that a substantially smaller number are located within the coastal region of the catchment, which may have a direct impact on the shellfish area. The characterisation report also indicates that the hydrological condition of the majority of the catchment poses a risk to surface waters, the risk to surface waters from pathogens and phosphorus is high throughout the catchment as is the likelihood of inadequate percolation.<br><br>In response to measures identified in the Pollution Reduction Programme to address OSWWTS pressures in the vicinity of the designated shellfish area<br><br>Fingal County Council<br>• Have carried out an assessment of the risk to the microbiological quality of shellfish from effluent discharges in April 2011.<br>• Have prepared and submitted to the EPA a report on "Balbriggan/Skerries Agglomeration – Assessment of the Impact on Shellfish Waters, Wastewater Discharge Licence No: D0023-01<br>• have conducted a rural house count in 2011 compiling information on septic tanks and OSWWTS at domestic premises. This will be completed in 2012 and a risk assessment on the impact of OSWWTS can then be carried out.<br>• are currently updating records on the drainage system in Fingal .<br>• have introduced an Fats, Oil & Grease Licencing Programme<br>• are carrying out reviews of all Trade Effluent |

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| | Discharges<br>• are carrying out investigative monitoring of rivers in the catchment<br>• carried out an information campaign comprising of a leaflet drop<br>• identified a measures /enforcement programme to be implemented under the Water Pollution Act and Section70 of the Water Services Act<br><br>Meath County Council have<br>• carried out a number of site inspections on OSWWTS within the contributing catchment<br>• carried out a number of stream surveys and investigations within the upper reaches of this contributing catchment<br>• identified a measures /enforcement programme to be implemented under the Water Pollution Act and Section 70 of the Water Services Act<br><br>The European Court of Justice has ruled against Ireland in relation to on-site wastewater treatment systems (ref. Case C-188/08). The Court found that by failing to adopt the necessary legislation to comply with Articles 4 and 8 of Council Directive 75/442/EEC as regards domestic waste waters disposed of in the countryside through septic tanks and other individual waste water treatment systems, Ireland has failed to fulfil its obligations under that directive. To address the ruling, the Water Services (Amendment) Act 2012 was signed by the President on 02/02/2012. This Act introduces a new system of registration and inspection for septic tanks and other on-site waste water treatment systems. The Act also sets out the responsibilities of households served by those systems (including requirements to carry out remedial actions where necessary). |
| **3.2 Potential Secondary Pressures** | Agriculture<br>Port Activities |
| Agriculture | Estimates of livestock density are equal to the national averages whereas the estimates of fertiliser usage are higher than the national averages.<br><br>In response to measures identified in the Pollution Reduction Programme to address Agricultural pressures in the vicinity of the designated shellfish area<br><br>Fingal County Council have engaged with consultants to carry out farm inspections in the Mill Stream catchment in Skerries. 26 farm inspections have been carried out to date. In addition to this<br>• an information campaign was carried out in this Shellfish Catchment area which comprised of a leaflet drop and an informal session with |

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| | the landowner.<br>• identified a measures /enforcement programme to be implemented under the Water Pollution Act and Section70 of the Water Services Act<br><br>Meath County Council have<br>• carried out farm inspections in the catchment.<br>• Identified agricultural land and activities directly adjacent to the shellfish growing areas<br>• Identified a measures enforcement programme to be implemented under the Water Pollution Act. |
| Port Activities | Balbriggan and Skerries harbours are adjacent to the shellfish area. |
| **4.0 PROTECTED AREAS** | |
| Designated Shellfish Areas | Balbriggan/Skerries designated Shellfish Waters |

| 5.1 ACTION PROGRAMME – MEASURES | |
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| **5.1 Key Pressures** | |
| Urban Wastewater Systems | **Overview:**<br>A system for the licensing or certification by the EPA of waste water discharges from areas served by local authority sewer networks was established in accordance with the requirements of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007).<br><br>In accordance with these Regulations the EPA is not allowed to grant an authorization for a waste water discharge, which, in the opinion of the EPA, would:<br><br>• cause a deterioration in the chemical status or ecological status (or ecological potential as the case may be) in the receiving body of surface water,<br><br>• exclude or compromise the achievement of the objectives established for protected species and natural habitats in the case of European sites where the maintenance or improvement of the status of water is an important factor in their protection or which is inconsistent with the achievement of environmental quality standards established under national Regulations in relation to designated bathing waters designated shellfish waters, areas designated for the protection of freshwater fish and areas designated for the abstraction of water intended for human consumption.<br><br>The requirements of the European Communities (Quality of Shellfish Waters) Regulations, 2006 (as amended) have been fully integrated into the EPA licensing process In addition this process takes into account the effect of viruses on the quality of shellfish waters. The licence will require detailed actions including infrastructural works, if required, by the licensee within specified time-frames if the discharge does not comply with the above Regulations. Each licence granted will be subject to enforcement by the EPA. Full details of each application and licence decision can be viewed online at www.epa.ie.<br><br>The following is the position with the key waste water treatment plant for Balbriggan/Skerries:<br><br>Balbriggan/Skerries – secondary treatment incorporating UV disinfection WWTP in place<br>The EPA issued a waste water discharge licence on the 22nd of October 2009. Conditions 5.6 and 5.7 of the licence state that a microbiological quality assessment of the shellfish in the designated shellfish area shall be carried out by April 2011 (and that any required appropriate measures shall be implemented within a timeframe agreed by the EPA). This assessment was carried out by FCC in April 2011 and the report was prepared and submitted to EPA. |
| On-site waste water treatment systems | Fingal County Council and Meath County Council have identified systems directly adjacent to estuarine and coastal waters and |

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| | water courses as well as systems serving large populations and have undertaken investigation of the likely extent of microbial contamination of Designated Shellfish Waters from adjoining dwellings and Section 4 licensed activities. Section 70 of the Water Services Act 2007 places a duty of care on owners of septic tanks and provides local authorities with enforcement powers including prosecution to address any problems identified.<br><br>The Report on Possible Risks from On-Site-Wastewater Treatment Systems on Designated Shellfish Water Areas, received from Fingal County Council and Meath County Council for the Balbriggan/Skerries Designated Shellfish Water Area has been reviewed and it is considered that the shellfish Water Area has been addressed adequately. Fingal and Meath County Council need to continue to implement the measures /enforcement programme as detailed in The Report on Possible Risks from On-Site-Wastewater Treatment Systems on Designated Shellfish Water Areas.<br><br>The need for on-site inspections based on the national implementation plan to be drawn up by the EPA should be factored into the overall risked based approach for inspections under the Water Services (Amendment) Act 2012. |
| **5.2 Potential Secondary Pressures** | |
| Agriculture | The Report on Possible Risks from Agriculture on Designated Shellfish Water Areas, received from Fingal County Council and Meath County Council for the Balbriggan/Skerries Designated Shellfish Water Area has been reviewed and it is considered that it would be prudent to<br>• ensure effective and targeted implementation of the Good Agricultural Practice Regulations<br>• continue to implement the measures /enforcement programme as detailed in The Report on Possible Risks from Agriculture on Designated Shellfish Water Areas, |
| Port Activities | Under the Prevention of Pollution at Sea Acts no ship is allowed to discharge within 3 miles of Balbriggan/Skerries. The disposal of ship generated waste (including sewage and bilge water) is covered by the European Communities (Port Reception Facilities for Ship Generated Waste and Cargo Residues) Regulations 2003 (S.I 117/2003) (as amended). The disposal of ship generated waste is facilitated by the making of an application to the Competent Authority, disposal is arranged by the ships agent and conformity checking is carried out by the competent authority. |
| Future Development | Under Article 4 of the European Communities (Quality of Shellfish Waters) Regulations 2006 (S.I. No. 286 of 2006) (as amended), every public authority that has functions the performance of which may affect shellfish waters shall perform those functions in a manner that will promote compliance with the objectives of this pollution reduction programme and with the objectives of the Shellfish Waters Directive. |

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| | The functions of particular importance – in light of the objectives of Directive 2006/113/EC and of this PRP – include waste water treatment (licensing and operations), implementation of the GAP Regulations, waste management (licensing and operations), effluent discharge licences, planning and development and building control.<br><br>Continued monitoring will be carried out during the lifetime of the PRP. Should this monitoring identify pressures that are impacting on shellfish water quality in the designated area, the PRP will be appropriately amended. |

**Compliance with the Parameters set out in the Directive**[1]

The Directive prescribes the minimum ((Mandatory (I)) quality criteria which must be met by shellfish waters and guideline values (G) which Member States must endeavour to observe. Not all of the Parameters have both Guide and Mandatory values.

| | | Compliance with Mandatory Values (Y/N) | Compliance with Guide Values (Y/N) |
|---|---|---|---|
| Parameter 1 | PH (I) | Y | |
| Parameter 2 | Temperature (G) | | Y |
| Parameter 3 | Coloration (after filtration) (I) | Y | |
| Parameter 4 | Suspended Solids (I) | Y | |
| Parameter 5 | Salinity (I & G) | Y | Y |
| Parameter 6 | Dissolved Oxygen (I & G) | Y | Y |
| Parameter 7 | Petroleum Hydrocarbons (I) | Y | |
| Parameter 8 | Organohalogens (I & G) | X[2] | X[2] |
| Parameter 9 | Trace Metals (I & G) | X[2] | X[2] |
| Parameter 10 | Faecal Coliforms (G) | | N[3] |



[1] Compliance for Parameters 1 to 7 - taken from 2011 monitoring results
Faecal Coliform compliance – 2012 monitoring results
[2] No results for Parameters 8 & 9 reported
[3] Non-compliance with Parameter 10 is being regulated by the actions in this PRP

## Annex 1

| Water Services Authority | Agglomeration Name | Registration Number | Population Equivalent | Status |
|---|---|---|---|---|
| Fingal County Council | Balbriggan/Skerries | D0023-01 | > 10,000 | Licensed |

## Annex 2 - Mitigation Recommendations from the SEA process

The Strategic Environmental Assessment carried out for the Shellfish PRPs has highlighted potential positive and negative environmental impacts (including cumulative impacts) associated with implementation of the range of measures outlined in the National Toolkit of Measures, all of which are aimed at controlling pressures which impact on shellfish water quality.

In most cases, the PRPs identify the need for further investigation to supplement existing information on the types and extent of the pressures which are currently affecting shellfish water quality. Following this, the next step in the protection of shellfish waters will be the introduction of measures from the National Toolkit to address the identified pressures. It should be noted that this PRP is a dynamic document and will be updated regularly in order to outline if, and where, measures are required following the completion of the investigations.

The table below outlines the mitigation measures required to reduce potential impacts from measures in the National Toolkit associated with the key and potential secondary pressures currently identified for this catchment. When considering implementation of specific measures from the National Toolkit, it is required that the relevant mitigation measures below be considered to reduce any potential negative impacts (mitigation measures arising from the Habitats Directive Article 6 Assessment are noted in blue).

Should further key and secondary pressures be identified in this catchment in future, then the full list of mitigation measures, which is included in Table 4 of the National Toolkit, should be consulted to determine if any of those apply. In addition, the authority/organisation/individual responsible for implementing each of the mitigation measures below is listed in Table 4 of the National Toolkit.

| | NATIONAL TOOLKIT MEASURE | ASSOCIATED MITIGATION MEASURE |
|---|---|---|
| **WFD4** | **POINT SOURCE & DIFFUSE SOURCE DISCHARGES**<br><br>Actions: Water Pollution Acts and regulations:<br>• License discharges to surface waters and sewers from small scale industrial and commercial sources. Review licenses at intervals of not less than 3 years. Keep registers of discharge licenses and make them available to the public.<br>• Serve notices or directions on persons requiring measures to be taken in order to prevent or control pollution of waters, where necessary.<br>• Notify Local Authorities of accidental discharges and spillages of polluting materials which enter, or are likely to enter, waters.<br><br>Other actions: Urban Wastewater Treatment Plants:<br>• Measures for improved management: keep register of plant capacity and update annually; install facilities to monitor influent loads and effluent discharges in accordance with Environmental Protection Agency guidelines and best practice; put auditable procedures in place to monitor compliance of licensed discharges; implement training procedures for staff involved with licensing of discharges; monitor receiving water quality upstream and downstream of the point of discharge.<br>• Optimise treatment plant performance by the implementation of a performance management system.<br>• Revise existing Water Pollution Act industrial licence conditions and reduce allowable pollution loading.<br>• Review existing Industrial Pollution Prevention Control licence conditions and reduce allowable pollution load.<br>• Investigate contributions to the collection system from unlicensed discharges.<br>• Investigate contributions to the collection system of specific substances known to impact ecological status resulting from licensed and unlicensed discharges and issue or revise licenses to reduce or remove such specific substances in the discharge. | Detailed assessment of higher risk works will be required to include environmental considerations (based on EIA guidance). It is recommended that lower risk work should be compelled to consider environmental issues as part of the registration process. |

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| | • Upgrade plant to increase capacity where necessary.<br>• Upgrade plant to provide nutrient removal treatment where necessary.<br><br>Actions: Wastewater Discharge Authorisation Regulations:<br>• License large Local Authority WWTPs and certify smaller WWTPs as specified in the Regulations (taking account of WFD objectives). Review licenses at intervals not less than 3 years. Enforce compliance with WWTP licensing conditions. Maintain a register of WWTP licences and certificates and make available on request. Inform other relevant public authorities when an application or review is received.<br><br>Actions: Water Services Act:<br>• Prepare and implement Water Services Strategic Plans.<br>• Duty of care on owners of premises to ensure that treatment systems for wastewater are kept in good condition.<br><br>Actions: Planning and Development Act (unsewered systems)<br>• Permit on-site waste water treatment systems subject to site suitability assessment.<br><br>Other actions: Unsewered Systems:<br>• Amend Building Regulations to give effect to new codes of practice for single houses and large systems. | |
| **WFD5** | **PHYSICAL MODIFICATIONS**<br><br>Actions required: physical modifications:<br>• Develop new morphology regulations creating a registration and authorisation system.<br><br>Actions: Planning and Development Act:<br>• Consider the morphological implications of developments as part of the planning process. | It is recommended that further environmental assessment is undertaken once measures are defined. |

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| **WW1** | **WASTE WATER TREATMENT PLANTS**<br><br>Measures intended to reduce loading to the treatment plant:<br>• Limit or cease the direct importation of polluting matter (e.g. liquid wastes, landfill leachate, sludges).<br>• Investigate the extent of use and impact of under-sink food waste disintegrators and take appropriate actions.<br>• Investigate fats/oils/grease influent concentrations and take actions to reduce FOG entering the collection system. | This measure should be accompanied by an education and awareness campaign for householders and commercial premises aimed at reducing pollution at source. This campaign should include information on the use and disposal of household chemicals, oils, detergents, paints, solvents, etc as well as information on phosphorus-related pollution. Consideration should also be given to targeting specific audiences on issues such as discharges to water and the importance of wetland sites to water quality.<br><br>This measure will require project level Habitats Directive Assessment if alternative facilities for treatment of waste are constructed, e.g. incinerator. |
| **WW2** | **WASTE WATER TREATMENT PLANTS**<br><br>Impose development controls where there is, or is likely to be in the future, insufficient capacity at treatment plants. | This measure will need to link to the development planning process, e.g. by including a requirement to address wastewater capacity as part of the scope in any accompanying SEA for development plans.<br><br>This measure will need to consider whole catchment loading. |
| **WW6 to WW9** | **WASTE WATER TREATMENT PLANTS**<br><br>WW6: Where necessary to achieve water quality objectives install secondary treatment at smaller plants where this level of treatment would not otherwise be required under the urban wastewater treatment regulations.<br><br>WW7: Apply a higher standard of treatment (stricter emission controls) where necessary.<br><br>WW8: Upgrade the plant to remove specific substances known to impact on water quality status<br><br>WW9: Install ultra-violet or similar type treatment. | WW6 to WW9: Negative impacts on climate associated with GHG emissions related to additional energy requirements for these measures should be offset by use of renewable energy sources or similar.<br><br>WW6 to WW9: If these alternatives involve the building of a new plant or an extension to an existing plant a Habitats Directive Assessment will be required. Prior to any proposals for a new plant, further investigation will be required to show that a new plant will have the desired improvements in water quality for which it is being built.<br><br>WW6 to WW8: If additional landtake is required for these measures, environmental studies will be undertaken to assess the impact on the environment.<br><br>WW9: A Habitats Directive Assessment will be required prior to introduction of UV or similar treatment when the discharge is within or adjacent to a protected area. |
| **WW10** | **WASTE WATER TREATMENT PLANTS**<br><br>Relocate the point of discharge. | A Habitats Directive Assessment will be required to demonstrate that the relocation will not negatively impact on protected areas. |

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| **UP3** | **ON-SITE WASTE WATER TREATMENT SYSTEMS**<br><br>For new developments:<br>• At planning assessment stage, apply the GIS risk mapping / decision support system and codes of practice<br>• Notice to planning authority required immediately prior to the installation of on-site effluent treatment systems including percolation areas and polishing filters. | The pre-planning process should assess whether Habitats Directive Assessment would be required for new development within or adjacent to a protected area. |
| **UP5 to UP7** | **ON-SITE WASTE WATER TREATMENT SYSTEMS**<br><br>UP5: Enforce requirements for percolation.<br><br>UP6: Enforce requirements for de-sludging.<br><br>UP7: Consider connection to municipal systems. | UP5 & UP6: An education programme should be carried out in tandem with new requirements for tank maintenance, including guidance on disposal of sludges.<br><br>UP6: Intelligent transport programmes should be put in place to minimise the amount of emissions associated with movement of sludges from on-site treatment systems.<br><br>UP7: Upgraded treatment works should be required to introduce BAT, including the use of renewable energy sources, in order to reduce GHG emissions and others resulting from increased demand for treatment.<br><br>UP6 & UP7: New wastewater treatment infrastructure, including sludge disposal infrastructure, will be subject to environmental assessment at the project level to reduce indirect impacts to biodiversity, landscape, cultural heritage and climate.<br><br>UP7: A Habitats Directive Assessment will be required for new structures. |

**Note: It should be noted that in this case the term Habitats Directive Assessment refers to the assessment process as specified in Article 6 of the Habitats Directive. This starts with screening to determine whether a likely significant impact from the plan/programme is expected to occur to a Natura 2000/Ramsar site as a result of activities in/adjacent to/in the catchment of a Natura 2000/Ramsar site. If, in accordance with Habitats Directive Assessment guidance (guidance produced by the EU and DoEHLG in Ireland), it can be shown that there is no potential for impact at the screening stage, no further assessment may be required. However when the plan/programme being screened lies within or adjacent to a Natura 2000/Ramsar site then such a determination must be made in consultation with NPWS. If the plan/programme is within the catchment (surface and groundwater) of a Natura 2000/Ramsar site, such consultation with NPWS is only necessary for those water dependent Natura 2000 sites which are listed in the WFD Register of Protected Areas.*

# APPENDIX 18

SOIL, GROUNDWATER SURFACE WATER AND TOPSOIL RESULTS TABLES

# SOIL RESULTS TABLES

| TABLE NO. | TABLE DESCRIPTION |
|---|---|
| A18.1 | Results of Volatile Organic Compound Laboratory Analysis on Soil Samples taken from Trialpits at Barnageeragh Cove, Skerries, Co. Dublin |
| A18.2 | Results of Semi Volatile Organic Compound Laboratory Analysis on Soil Samples taken from Trialpits at Barnageeragh Cove, Skerries, Co. Dublin |

# Table A18.1. Results of Volatile Organic Compound Laboratory Analysis on Soil Samples taken from Trialpits at Barnageeragh Cove, Skerries, Co. Dublin

| Volatile Organic Compounds | Dutch Criteria | | SO-TP2-01 | SO-TP7-01 | SO-TP8-01 | SO-TP14-02 | SO-TP21-01 |
|---|---|---|---|---|---|---|---|
| | TV | IV | | | | | |
| **Depth (m BGL)** | | | 0 - 4.0 | 1.6 - 4.6 | 1.5 - 4.1 | 2.3 - 4.4 | 1.3 - 4.0 |
| **Units** | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| Dichlorodifluoromethane | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Chloromethane | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Vinyl Chloride | 0.01 | 0.1 | <0.001 | <0.001 | <0.001 | <0.001 | **0.0021** |
| Bromomethane | - | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Chloroethane | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Trichlorofluoromethane | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloroethene | 0.1 | 0.3 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Trans 1,2-Dichloroethene | 0.2 | 1 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloroethane | 0.02 | 15 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| cis 1,2-Dichloroethene | 0.02 | 4 | <0.001 | <0.001 | <0.001 | <0.001 | **0.011** |
| Bromochloromethane | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Trichloromethane | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,1-Trichloroethane | 0.07 | 15 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Tetrachloromethane | 0.4 | 1 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloropropene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Benzene | 0.01 | 1 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dichloroethane | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Trichloroethene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dichloropropane | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Dibromomethane | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromodichloromethane | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| cis-1,3-Dichloropropene | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Toluene | 0.01 | 130 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Trans-1,3-Dichloropropene | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,1,2-Trichloroethane | 0.4 | 10 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Tetrachloroethene | 0.002 | 4 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichloropropane | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Dibromochloromethane | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,2-Dibromoethane | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chlorobenzene | 0.3 | 30 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,1,2-Tetrachloroethane | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Ethylbenzene | 0.03 | 50 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| m & p-Xylene | 0.01 | 25 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| o-Xylene | 0.01 | 25 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Styrene | 0.3 | 100 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Tribromomethane | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Isopropylbenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromobenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichloropropane | - | - | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| N-Propylbenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 2-Chlorotoluene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3,5-Trimethylbenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Chlorotoluene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Tert-Butylbenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,4-Trimethylbenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Sec-Butylbenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichlorobenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Isopropyltoluene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,4-Dichlorobenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| N-Butylbenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dichlorobenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromo-3-Chloropropane | - | - | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| 1,2,4-Trichlorobenzene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Hexachlorobutadiene | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichlorobenzene | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Methyl Tert-Butyl Ether | - | 100 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

# Table A18.2. Results of Semi Volatile Organic Compound Laboratory Analysis on Soil Samples taken from Trialpits at Barnageeragh Cove, Skerries, Co. Dublin

| Semi-Volatile Organic Compounds | Dutch | | SO-TP2-01 | SO-TP7-01 | SO-TP8-01 | SO-TP14-02 | SO-TP21-01 |
|---|---|---|---|---|---|---|---|
| | TV | IV | | | | | |
| Depth (m BGL) | | | 0 - 4.0 | 1.6 - 4.6 | 1.5 - 4.1 | 2.3 - 4.4 | 1.3 - 4.0 |
| Units | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| **PHENOLS** | **0.05** | **40** | | | | | |
| 2-Chlorophenol | | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2-Methylphenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2-Methyl-4,6-Dinitrophenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2-Nitrophenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2,4-Dichlorophenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2,4-Dimethylphenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2,4,5-Trichlorophenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2,4,6-Trichlorophenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 4-Chloro-3-methylphenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 4-Methylphenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 4-Nitrophenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Pentachlorophenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Phenol | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Nitrobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Azobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 1,3-Dichlorobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 1,4-Dichlorobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 1,2-Dichlorobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 1,2,4-Trichlorobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2-Chloronaphthalene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Hexachlorobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2-Methylnaphthalene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Naphthalene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Acenaphthylene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Acenaphthene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Fluorene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Pyrene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Dibenzo(a,h)anthracene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Phenanthrene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Anthracene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Fluoranthene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Benzo[a]anthracene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Chrysene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Benzo[b]fluoranthene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Benzo[k]fluoranthene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Benzo[a]pyrene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Benzo[g,h,i]perylene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Indeno(1,2,3-c,d)Pyrene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| **TOTAL 17 PAHS** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| Dimethyl phthalate | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Diethyl phthalate | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Di-n-butylphthalate | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Di-n-octylphthalate | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Bis(2-ethylhexyl)phthalate | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Butylbenzylphthalate | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| ***TOTAL PHTHALATE (sum of 6)*** | ***0.1*** | **60** | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| **OTHER SVOCs** | | | | | | | |
| 2-Nitroaniline | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2,4-Dinitrotoluene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 2,6-Dinitrotoluene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 3-Nitroaniline | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 4-Bromophenylphenylether | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 4-Chloroaniline | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 4-Chlorophenylphenylether | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| 4-Nitroaniline | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Azobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Bis(2-chloroethoxy)methane | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Bis(2-chloroethyl)ether | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Carbazole | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Dibenzofuran | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Hexachlorobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Hexachlorobutadiene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Hexachlorocyclopentadiene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Hexachloroethane | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Isophorone | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| N-nitrosodi-n-propylamine | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Pentachlorobenzene | - | - | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |

# GROUNDWATER RESULTS TABLES

| TABLE NO. | TABLE DESCRIPTION |
|---|---|
| A18.3 | Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 at Barnegeernagh Cove, Skerries, Co. Dublin (27.06.17) |
| A18.4 | Results of Volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 at Barnegeernagh Cove, Skerries, Co. Dublin (27.06.17) |
| A18.5 | Results of Semi-volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 at Barnegeernagh Cove, Skerries, Co. Dublin (27.06.17) |
| A18.6 | Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Groundwater Samples taken from Groundwater Monitoring Wells BH1 - BH4 at Barnageeragh Cove, Skerries, Co. Dublin (27.06.17) |
| A18.7 | Major Ion Balance on Groundwater Samples (BH1 - BH4) taken at Barnageeragh Cove, Skerries, Co. Dublin (27.06.2017) |
| A18.8 | Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH8-BH13 at Barnegeernagh Cove, Skerries, Co. Dublin (2.08.17) |
| A18.9 | Results of Volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH8-BH13 at Barnegeernagh Cove, Skerries, Co. Dublin (2.08.17) |
| A18.10 | Results of Semi-volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH8-BH13 at Barnegeernagh Cove, Skerries, Co. Dublin (2.08.17) |
| A18.11 | Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Groundwater Samples taken from Groundwater Monitoring Wells BH8 - BH13 at Barnageeragh Cove, Skerries, Co. Dublin (2.08.17) |
| A18.12 | Major Ion Balance on Groundwater Samples (BH8 – BH13) taken at Barnageeragh Cove, Skerries, Co. Dublin (2.08.17) |

# GROUNDWATER RESULTS TABLES (CONTINUED)

| TABLE NO. | TABLE DESCRIPTION |
|---|---|
| A18.13 | Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 and BH8-BH14 at Barnegeernagh Cove, Skerries, Co. Dublin (15.11.17) |
| A18.14 | Results of Volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 and BH8-BH14 at Barnegeernagh Cove, Skerries, Co. Dublin (15.11.17) |
| A18.15 | Results of Semi-volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 and BH8-BH14 at Barnegeernagh Cove, Skerries, Co. Dublin (15.11.17) |
| A18.16 | Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Groundwater Samples taken from Groundwater Monitoring Wells BH1-BH4 and BH8 - BH10 at Barnageeragh Cove, Skerries, Co. Dublin (15.11.17) |
| A18.17 | Major Ion Balance on Groundwater Samples (BH1 - BH4 and BH8-BH14) taken at Barnageeragh Cove, Skerries, Co. Dublin (15.11.17) |
| A18.18 | Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 and BH8-BH17 at Barnegeernagh Cove, Skerries, Co. Dublin (24.05.18) |
| A18.19 | Results of Volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 and BH8-BH17 at Barnegeernagh Cove, Skerries, Co. Dublin (24.05.18) |
| A18.20 | Results of Semi-volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 and BH8-BH17 at Barnegeernagh Cove, Skerries, Co. Dublin (24.05.18) |
| A18.21 | Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Groundwater Samples taken from Groundwater Monitoring Wells BH1-BH4 and BH8-BH17 at Barnageeragh Cove, Skerries, Co. Dublin (25.05.18) |
| A18.22 | Major Ion Balance on Groundwater Samples (BH1 - BH4 and BH8-BH17) taken at Barnageeragh Cove, Skerries, Co. Dublin (25.05.2017) |

# Table A18.3. Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 at Barnegeernagh Cove, Skerries, (27.06.17)

| CHEMICAL SUBGROUPING | | Aliphatics | | | | | | | | | Aromatics | | | | | | | | | Total Petroleum Hydrocarbons (EPH (C8-C40)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | EC C5-C6 | EC>C6-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aliphatics | EC C5-C7 | EC>C7-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aromatics | |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | - | - | - | - | - | - | - | 600 | - | - | - | - | - | - | - | - | - | - |
| | Dutch Target Level | - | - | - | - | - | - | - | - | 50 | - | - | - | - | - | - | - | - | - | - |
| World Health Organisation Standard | Guideline Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SI No. 81 of 1988 - EC Regs (Quality of water intended for human consumption). | MACs | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SI No. 439 of 2000 - EC Drinking Water Regs. | Parametric Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'. | Guideline Values (IGVs) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 |
| EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010 | Threshold Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.5 |
| UK Technical and Advisory Group on the WFD, River Management Plan 2015 - 2021 | Recommended Standards for Hazardous Substances (Groundwater) | | | | | | | | | | | | | | | | | | | - |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Minimum Threshold Value | | | | | | | | | | | | | | | | | | | - |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Maximum Threshold Value | | | | | | | | | | | | | | | | | | | - |
| DAY SAMPLED | GROUNDWATER WELLS | | | | | | | | - | | | | | | | | | | | |
| | WA-BH1-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH2-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH3-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH4-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |



Notes:

553 Values are underlined wherever Dutch-TV is exceeded

**553** Values are shaded yellow and in bold wherever Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are exceeded

- '-' signifies analysis not carried out on sample or no Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are available.

# Table A18.3. Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 at Barnegeernagh Cove, Skerries, (27.06.17)

| CHEMICAL SUBGROUPING | | Petrol Range Organics | | | | | | | | Polyaromatic Hydrocarbons (PAHS) | | | | | | | | | | | | | | | | Total Cyanide | Total Phenols |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | MTBE | Benzene | Toluene | Ethylbenzene | m-/p-Xylene | o-Xylene | Total Xylene | TOTAL BTEX | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)+ Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(123cd)pyrene | Dibenzo(ah)anthracene | Benzo(ghi)perylene | Total 16 EPA PAHs | | |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | 30 | 1000 | 150 | 70 | 70 | 70 | - | 70 | - | - | - | 5 | 5 | 1 | - | 0.5 | 0.2 | 0.05 | 0.05 | 0.05 | - | 0.05 | - | - | - |
| | Dutch Target Level | - | 0.2 | 7 | 4 | 0.2 | 0.2 | 0.2 | - | 0.01 | - | - | - | 0.003 | 0.0007 | 0.003 | - | 0.0001 | 0.003 | 0.0004 | 0.0005 | 0.0004 | - | 0.0003 | - | - | - |
| World Health Organisation Standard | Guideline Values | 30 | 10 | 700 | 300 | - | - | 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | - |
| SI No. 81 of 1988 - EC Regs (Quality of water intended for human consumption). | MACs | - | - | 0.2 | 0.2 | 0.2 | | - | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| SI No. 439 of 2000 - EC Drinking Water Regs. | Parametric Values | - | 1 | - | - | - | - | - | - | - | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'. | Guideline Values (IGVs) | 30 | 1 | 10 | 10 | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | 0.5 |
| EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010 | Threshold Values | 10 | 0.75 | 525 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0075 | - | - | - | 0.075 | 37.5 | - |
| UK Technical and Advisory Group on the WFD, River Management Plan 2015 - 2021 | Recommended Standards for Hazardous Substances (Groundwater) | - | 1 | 4 | - | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Minimum Threshold Value | - | 10.1 | 51 | - | 30.3 | - | - | - | 2.4 | - | - | - | - | 0.1 | 0.1 | - | - | - | - | - | - | - | - | - | | |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Maximum Threshold Value | - | 55.2 | 276 | - | 166 | - | - | - | 13.2 | - | - | - | - | 0.55 | 0.6 | - | - | - | - | - | - | - | - | - | | |
| DAY SAMPLED | GROUNDWATER WELLS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | WA-BH1-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH2-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH3-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH4-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |



Notes:

553 Values are underlined wherever Dutch-TV is exceeded

553 Values are shaded yellow and in bold wherever Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are exceeded

- '-' signifies analysis not carried out on sample or no Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are available.

# Table A18.4. Results of Volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH4 at Barnegeernagh Cove, Skerries, Co. Dublin (27.06.17)

| Parameters | Units | Standards | | | Guidelines | | Analytical Results | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010 THRESHOLD VALUES | WA-BH1-01 | WA-BH2-01 | WA-BH3-01 | WA-BH4-01 |
| Dichlorodifluoromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Chloromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Vinyl Chloride | mg/l | 0.0005 | 0.00001 | 0.00500 | - | 0.000375 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromomethane | mg/l | 0.0005 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 |
| Chloroethane | mg/l | 0.0005 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 |
| Trichlorofluoromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| trans-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Dichloromethane | mg/l | - | 0.00001 | 1.00000 | 0.01 | - | <0.020 | <0.020 | <0.020 | <0.020 |
| Carbon disulphide | mg/l | 0.0005 | - | - | - | - | | | | |
| 1,1-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloroethane | mg/l | 0.0005 | 0.00700 | 0.90000 | 0.03 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| tert-butyl methyl ether | mg/l | 0.0005 | - | 9.20000 | 0.03 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| cis-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromochloromethane | mg/l | 0.1 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 |
| Chloroform | mg/l | 0.1 | 0.00600 | 0.40000 | 0.012 | - | | | | |
| 2,2-Dichloropropane | mg/l | 0.1 | 0.00080 | 0.08000 | - | - | | | | |
| 1,2-Dichloroethane | mg/l | 0.1 | 0.00700 | 0.40000 | 0.003 | 0.00225 | <0.002 | <0.002 | <0.002 | <0.002 |
| 1,1,1-Trichloroethane | mg/l | - | 0.00001 | 0.30000 | 0.5 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloropropene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Benzene | mg/l | - | 0.00020 | 0.03000 | 0.001 | 0.00075 | <0.001 | <0.001 | <0.001 | <0.001 |
| Carbontetrachloride | mg/l | - | - | - | - | - | | | | |
| Dibromomethane | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,2-Dichloropropane | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromodichloromethane | mg/l | 0.0002 | - | | - | - | <0.005 | <0.005 | <0.005 | <0.005 |
| Trichloroethene | mg/l | 0.0002 | 0.02400 | 0.30000 | 0.07 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Trichloromethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Tetrachloromethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Tribromomethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| cis-1,3-Dichloropropene | mg/l | 0.0002 | | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| trans-1,3-Dichloropropene | mg/l | 0.0002 | | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,1,2-Trichloroethane | mg/l | 0.0002 | 0.00001 | 0.13000 | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| Toluene | mg/l | 0.0002 | 0.00700 | 1.00000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichloropropane | mg/l | 0.0002 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 |
| Dibromochloromethane | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromoethane | mg/l | 0.0002 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 |
| Tetrachloroethene | mg/l | 0.0002 | 0.0000100 | 0.04000 | 0.002 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0002 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 |
| Chlorobenzene | mg/l | 0.0002 | 0.0070000 | 0.18000 | 0.001 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.0002 | 0.0040000 | 0.15000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| p/m-Xylene | mg/l | 0.0002 | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromoform | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Styrene | mg/l | 0.0002 | 0.00600 | 0.30000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,2,2-Tetrachloroethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| o-Xylene | mg/l | - | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichloropropane | mg/l | - | - | - | - | - | <0.050 | <0.050 | <0.050 | <0.050 |
| Isopropylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromobenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 2-Chlorotoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Propylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Chlorotoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,4-Trimethylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Isopropyltoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3,5-Trimethylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,4-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| sec-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| tert-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | 0.003 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| n-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromo-3-chloropropane | mg/l | 0.1 | - | - | - | - | <0.050 | <0.050 | <0.050 | <0.050 |
| 1,2,4-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | 0.0004 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | - | - | <0.002 | <0.002 | <0.002 | <0.002 |
| Hexachlorobutadiene | mg/l | - | - | - | 0.0001 | - | <0.001 | <0.001 | <0.001 | <0.001 |
| Toluene-d8 | ug/l | - | - | - | - | - | | | | |
| 4-bromofluorobenzene | ug/l | - | - | - | - | - | | | | |



Notes:

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded |
| - | '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available |

# Table A18.5. Results of Semi-volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH13 at Barnegeernagh Cove, Skerries, Co. Dublin (27.6.17)

| Parameters | Units | Standards | | | Guidelines | | Analytical Results | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010. THRESHOLD VALUES | WA-BH1-01 | WA-BH2-01 | WA-BH3-01 | WA-BH4-01 |
| Phenol | mg/l | 0.0005 | 0.20000 | 2.00000 | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methyl-4,6-Dinitrophenol | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Chlorophenol | mg/l | 0.0005 | 0.00030 | 0.10000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dichlorophenol | mg/l | 0.0005 | 0.00020 | 0.03000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dimethylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloro-3-methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4,6-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4,5-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Pentachlorophenol | mg/l | 0.0005 | 0.00004 | 0.00300 | 0.00200 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitrophenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitrophenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,3-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,4-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,2-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,2,4-Trichlorobenzene | mg/l | 0.1 | 0.00001 | 0.01000 | 0.00040 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Nitrobenzene | mg/l | - | - | - | 0.01000 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Azobenzene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobenzene | mg/l | - | 0.00000009 | 0.00050 | 0.00003 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthylene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Fluorene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Pyrene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(b)fluoranthrene | mg/l | 0.0002 | - | - | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Naphthalene | mg/l | 0.0002 | 0.00001 | 0.07000 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Anthracene | mg/l | 0.0002 | 0.000007 | 0.00500 | 10.00000 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Phenanthrene | mg/l | 0.0002 | 0.000003 | 0.00500 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Fluoranthrene | mg/l | 0.0002 | 0.000003 | 0.00100 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)anthracene | mg/l | 0.0002 | 0.0000001 | 0.00050 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Chrysene | mg/l | 0.0002 | 0.0000030 | 0.00020 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)pyrene | mg/l | 0.0002 | 0.00000005 | 0.00005 | 0.00001 | 0.000000075 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(ghi)perylene | mg/l | 0.0002 | 0.0000003 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(k)fluoranthrene | mg/l | 0.0002 | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.0002 | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dibenzo(a,h)anthracene | mg/l | 0.0002 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Chloronaphthalene | mg/l | 0.0002 | - | 0.006 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylnaphthalene | mg/l | 0.0002 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Carbazole | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Isophorone | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dibenzofuran | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dimethyl phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Diethyl phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Di-n-butylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Di-n-octylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-ethylhexyl)phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Butylbenzylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloroaniline | mg/l | - | - | 0.030 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitroanaline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 3-Nitroaniline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitroaniline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| N-Nitrosodimethylamine | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dinitrotoluene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,6-Dinitrotoluene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethyl)ether | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-Chloroisopropyl)Ether | mg/l | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Bromophenylphenylether | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chlorophenylphenylether | mg/l | 0.1 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachloroethane | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobutadiene | mg/l | - | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexchlorocyclopentadiene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethoxy)methane | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| N-nitrosodi-n-propylamine | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| | | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 |



Notes:

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded |
| - | '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available |

# Table A18.6. Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Groundwater Samples taken from Groundwater Monitoring Wells BH1 - BH4 at Barnageeragh Cove, Skerries, Co. Dublin (27.06.17)

| Parameters | Units | Guidelines | Standards | | GROUNDWATER | | | |
|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | WA-BH1-01 | WA-BH2-01 | WA-BH3-01 | WA-BH4-01 |
| Trifluralin | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 |
| Endosulfan I | µg/l | 0.1 | 0.0002 | 0.005 | <0.20 | <0.20 | <0.20 | <0.20 |
| *Aldrin* | µg/l | 0.1 | 0.000009 | - | <0.20 | <0.20 | <0.20 | <0.20 |
| *Dieldrin* | µg/l | 0.1 | 0.00004 | - | <0.20 | <0.20 | <0.20 | <0.20 |
| Endosulfan II | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 |
| Gamma-HCH (Lindane) | µg/l | - | - | - | <0.20 | <0.20 | <0.20 | <0.20 |
| Dichlorprop | µg/l | 0.1 | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| Mecoprop | µg/l | 0.1 | - | - | <0.40 | <0.40 | <0.40 | <0.40 |
| Atrazine | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 |
| Simazne | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 |



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|---|
| 553 |
| **553** |
| - |

Notes:

As New Dutch Criteria have no chlorinated pesticide standards, old standards are referenced.

Values are underlined wherever Dutch-TV is exceeded

Values are shaded yellow and in RED bold wherever Dutch-IV and/or SI No. 81 of 1988 MACs are exceeded

-' signifies analysis not carried out on sample or no Dutch Criteria is available.

## Table A18.7. Major Ion Balance on Groundwater Samples (BH1 - BH4) taken at Barnageeragh Cove, Skerries, Co. Dublin (27.06.2017)

| | | Cations | | | | Anions | | | Balance | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Elec. Cond. ($\mu Scm^{-1}$) | $Ca^{2+}$ (meq $L^{-1}$) | $Mg^{2+}$ (meq $L^{-1}$) | $Na^{+}$ (meq $L^{-1}$) | $K^{+}$ (meq $L^{-1}$) | $Cl^{-}$ (meq $L^{-1}$) | $SO_4^{2-}$ (meq $L^{-1}$) | $HCO_3^{-}$ (meq $L^{-1}$) | $\sum^{+}$ (meq $L^{-1}$) | $\sum^{-}$ (meq $L^{-1}$) | % Ion Balance Error | pH |
| WA-BH1-01 | 10000 | 36.93 | 78.13 | 60.88 | 23.79 | 62.05 | 66.63 | 11.76 | 199.72 | 140.44 | 17.43 | 7.9 |
| WA-BH2-01 | 690 | 7.49 | 3.37 | 2.04 | 0.54 | 1.04 | 1.15 | 6.59 | 13.44 | 8.78 | 20.98 | 7.8 |
| WA-BH3-01 | 1800 | 16.97 | 4.93 | 2.48 | 0.77 | 2.03 | 10.20 | 7.76 | 25.15 | 20.00 | 11.41 | 7.6 |
| WA-BH4-01 | 1900 | 16.97 | 8.14 | 3.61 | 1.28 | 3.38 | 2.29 | 15.29 | 30.00 | 20.97 | 17.71 | 7.3 |

# Table A18.8. Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH8-BH13 at Barnegeernagh Cove, Skerries, (2.08.17)

| CHEMICAL SUBGROUPING | | Aliphatics | | | | | | | | | Aromatics | | | | | | | | | Total Petroleum Hydrocarbons (EPH (C8-C40)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | EC C5-C6 | EC>C6-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aliphatics | EC C5-C7 | EC>C7-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aromatics | |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | - | - | - | - | - | - | - | 600 | - | - | - | - | - | - | - | - | - | - |
| | Dutch Target Level | - | - | - | - | - | - | - | - | 50 | - | - | - | - | - | - | - | - | - | - |
| World Health Organisation Standard | Guideline Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SI No. 81 of 1988 - EC Regs (Quality of water intended for human consumption). | MACs | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SI No. 439 of 2000 -EC Drinking Water Regs. | Parametric Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'. | Guideline Values (IGVs) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 |
| EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010 | Threshold Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.5 |
| UK Technical and Advisory Group on the WFD, River Management Plan 2015 - 2021 | Recommended Standards for Hazardous Substances (Groundwater) | | | | | | | | | | | | | | | | | | | - |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Minimum Threshold Value | | | | | | | | | | | | | | | | | | | - |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Maximum Threshold Value | | | | | | | | | | | | | | | | | | | - |
| DAY SAMPLED | GROUNDWATER WELLS | | | | | | | | - | | | | | | | | | | | |
| | WA-BH8-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH9-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH10-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH11-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH12-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH13-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |



Notes:

553 Values are underlined wherever Dutch-TV is exceeded

**553** Values are shaded yellow and in bold wherever Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are exceeded

\- '-' signifies analysis not carried out on sample or no Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are available.

# Table A18.8. Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH8-BH13 at Barnegeernagh Cove, Skerries, (2.08.17)

| CHEMICAL SUBGROUPING | | Petrol Range Organics | | | | | | | | Polyaromatic Hydrocarbons (PAHS) | | | | | | | | | | | | | | | | Total Cyanide | Total Phenols |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | MTBE | Benzene | Toluene | Ethylbenzene | m-/p-Xylene | o-Xylene | Total Xylene | TOTAL BTEX | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)+ Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(123cd)pyrene | Dibenzo(ah)anthracene | Benzo(ghi)perylene | Total 16 EPA PAHs | | |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | 30 | 1000 | 150 | 70 | 70 | 70 | - | 70 | - | - | - | 5 | 5 | 1 | - | 0.5 | 0.2 | 0.05 | 0.05 | 0.05 | - | 0.05 | - | - | - |
| | Dutch Target Level | - | 0.2 | 7 | 4 | 0.2 | 0.2 | 0.2 | - | 0.01 | - | - | - | 0.003 | 0.0007 | 0.003 | - | 0.0001 | 0.003 | 0.0004 | 0.0005 | 0.0004 | - | 0.0003 | - | - | - |
| World Health Organisation Standard | Guideline Values | 30 | 10 | 700 | 300 | - | - | 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | - |
| SI No. 81 of 1988 - EC Regs (Quality of water intended for human consumption). | MACs | - | - | 0.2 | 0.2 | 0.2 | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| SI No. 439 of 2000 -EC Drinking Water Regs. | Parametric Values | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'. | Guideline Values (IGVs) | 30 | 1 | 10 | 10 | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | 0.5 |
| EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010 | Threshold Values | 10 | 0.75 | 525 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0075 | - | - | - | 0.075 | 37.5 | - |
| UK Technical and Advisory Group on the WFD, River Management Plan 2015 - 2021 | Recommended Standards for Hazardous Substances (Groundwater) | - | 1 | 4 | - | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Minimum Threshold Value | - | 10.1 | 51 | - | 30.3 | - | - | - | 2.4 | - | - | - | - | 0.1 | 0.1 | - | - | - | - | - | - | - | - | - | | |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Maximum Threshold Value | - | 55.2 | 276 | - | 166 | - | - | - | 13.2 | - | - | - | - | 0.55 | 0.6 | - | - | - | - | - | - | - | - | - | | |
| DAY SAMPLED | GROUNDWATER WELLS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | WA-BH8-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH9-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH10-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH11-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH12-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH13-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |



Notes:

553 Values are underlined wherever Dutch-TV is exceeded

**553** Values are shaded yellow and in bold wherever Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are exceeded

\- '-' signifies analysis not carried out on sample or no Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are available.

# Table A18.9. Results of Volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH8-BH13 at Barnegeernagh Cove, Skerries, Co. Dublin (2.08.17)

| Parameters | Units | Standards | | | Guidelines | | Analytical Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010 THRESHOLD VALUES | WA-BH8-01 | WA-BH9-01 | WA-BH10-01 | WA-BH11-01 | WA-BH12-01 | WA-BH13-01 |
| Dichlorodifluoromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Chloromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Vinyl Chloride | mg/l | 0.0005 | 0.00001 | 0.00500 | - | 0.000375 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromomethane | mg/l | 0.0005 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chloroethane | mg/l | 0.0005 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Trichlorofluoromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| trans-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Dichloromethane | mg/l | - | 0.00001 | 1.00000 | 0.01 | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Carbon disulphide | mg/l | 0.0005 | - | - | - | - | | | | | | |
| 1,1-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloroethane | mg/l | 0.0005 | 0.00700 | 0.90000 | 0.03 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| tert-butyl methyl ether | mg/l | 0.0005 | - | 9.20000 | 0.03 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| cis-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromochloromethane | mg/l | 0.1 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chloroform | mg/l | 0.1 | 0.00600 | 0.40000 | 0.012 | - | | | | | | |
| 2,2-Dichloropropane | mg/l | 0.1 | 0.00080 | 0.08000 | - | - | | | | | | |
| 1,2-Dichloroethane | mg/l | 0.1 | 0.00700 | 0.40000 | 0.003 | 0.00225 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| 1,1,1-Trichloroethane | mg/l | - | 0.00001 | 0.30000 | 0.5 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloropropene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Benzene | mg/l | - | 0.00020 | 0.03000 | 0.001 | 0.00075 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Carbontetrachloride | mg/l | - | - | - | - | - | | | | | | |
| Dibromomethane | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,2-Dichloropropane | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromodichloromethane | mg/l | 0.0002 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Trichloroethene | mg/l | 0.0002 | 0.02400 | 0.50000 | 0.07 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Trichloromethane | mg/l | - | - | - | | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Tetrachloromethane | mg/l | - | - | - | | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Tribromomethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| cis-1,3-Dichloropropene | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| trans-1,3-Dichloropropene | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,1,2-Trichloroethane | mg/l | 0.0002 | 0.00001 | 0.13000 | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Toluene | mg/l | 0.0002 | 0.00700 | 1.00000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichloropropane | mg/l | 0.0002 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Dibromochloromethane | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromoethane | mg/l | 0.0002 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Tetrachloroethene | mg/l | 0.0002 | 0.0000100 | 0.04000 | 0.002 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0002 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Chlorobenzene | mg/l | 0.0002 | 0.0070000 | 0.18000 | 0.001 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.0002 | 0.0040000 | 0.15000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| p/m-Xylene | mg/l | 0.0002 | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromoform | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Styrene | mg/l | 0.0002 | 0.00600 | 0.30000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,2,2-Tetrachloroethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| o-Xylene | mg/l | - | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichloropropane | mg/l | - | - | - | - | - | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Isopropylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromobenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 2-Chlorotoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Propylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Chlorotoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,4-Trimethylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Isopropyltoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3,5-Trimethylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,4-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| sec-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| tert-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | 0.003 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| n-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromo-3-chloropropane | mg/l | 0.1 | - | - | - | - | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| 1,2,4-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | 0.0004 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Hexachlorobutadiene | mg/l | - | - | - | 0.0001 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |



Notes:

553 — Values are underlined wherever Dutch-TV is exceeded

**553** — Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded

\- — '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available

# Table A18.10. Results of Semi-volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH13 at Barnegeernagh Cove, Skerries, Co. Dublin (2.8.17)

| Parameters | Units | Standards | | | Guidelines | | Analytical Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010. THRESHOLD VALUES | WA-BH8-01 | WA-BH9-01 | WA-BH10-01 | WA-BH11-01 | WA-BH12-01 | WA-BH13-01 |
| Phenol | mg/l | 0.0005 | 0.20000 | 2.00000 | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methyl-4,6-Dinitrophenol | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Chlorophenol | mg/l | 0.0005 | 0.00030 | 0.10000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dichlorophenol | mg/l | 0.0005 | 0.00020 | 0.03000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dimethylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloro-3-methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4,6-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4,5-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Pentachlorophenol | mg/l | 0.0005 | 0.00004 | 0.00300 | 0.00200 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitrophenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitrophenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,3-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,4-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,2-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,2,4-Trichlorobenzene | mg/l | 0.1 | 0.00001 | 0.01000 | 0.00040 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Nitrobenzene | mg/l | - | - | - | 0.01000 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Azobenzene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobenzene | mg/l | - | 0.00000009 | 0.00050 | 0.00003 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthylene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Fluorene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Pyrene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(b)fluoranthrene | mg/l | 0.0002 | - | - | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Naphthalene | mg/l | 0.0002 | 0.00001 | 0.07000 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Anthracene | mg/l | 0.0002 | 0.000007 | 0.00500 | 10.00000 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Phenanthrene | mg/l | 0.0002 | 0.000003 | 0.00500 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Fluoranthrene | mg/l | 0.0002 | 0.000003 | 0.00100 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)anthracene | mg/l | 0.0002 | 0.0000001 | 0.00050 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Chrysene | mg/l | 0.0002 | 0.0000030 | 0.00020 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)pyrene | mg/l | 0.0002 | 0.0000005 | 0.00005 | 0.00001 | 0.000000075 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(ghi)perylene | mg/l | 0.0002 | 0.0000003 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(k)fluoranthrene | mg/l | 0.0002 | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.0002 | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dibenzo(a,h)anthracene | mg/l | 0.0002 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Chloronaphthalene | mg/l | 0.0002 | - | 0.006 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylnaphthalene | mg/l | 0.0002 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Carbazole | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Isophorone | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dibenzofuran | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dimethyl phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Diethyl phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Di-n-butylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Di-n-octylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-ethylhexyl)phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Butylbenzylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloroaniline | mg/l | - | - | 0.030 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitroanaline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 3-Nitroaniline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitroaniline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| N-Nitrosodimethylamine | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dinitrotoluene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,6-Dinitrotoluene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethyl)ether | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-Chloroisopropyl)Ether | mg/l | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Bromophenylphenylether | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chlorophenylphenylether | mg/l | 0.1 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachloroethane | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobutadiene | mg/l | - | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexchlorocyclopentadiene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethoxy)methane | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| N-nitrosodi-n-propylamine | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| | | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |



Notes:

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded |
| - | '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available |

**Table A18.11. Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Groundwater Samples taken from Groundwater Monitoring Wells BH8 - BH13 at Barnageeragh Cove, Skerries, Co. Dublin (2.8.17)**

| Parameters | Units | Guidelines | Standards | | GROUNDWATER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | WA-BH8-01 | WA-BH9-01 | WA-BH10-01 | WA-BH11-01 | WA-BH12-01 | WA-BH13-01 |
| Trifluralin | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Endosulfan I | µg/l | 0.1 | 0.0002 | 0.005 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| *Aldrin* | µg/l | 0.1 | 0.000009 | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| *Dieldrin* | µg/l | 0.1 | 0.00004 | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Endosulfan II | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Gamma-HCH (Lindane) | µg/l | - | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Dichlorprop | µg/l | 0.1 | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Mecoprop | µg/l | 0.1 | - | - | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Atrazine | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Simazne | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |



Notes:

As New Dutch Criteria have no chlorinated pesticide standards, old standards are referenced.

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in RED bold wherever Dutch-IV and/or SI No. 81 of 1988 MACs are exceeded |
| - | -' signifies analysis not carried out on sample or no Dutch Criteria is available. |

**Table A18.12. Major Ion Balance on Groundwater Samples (BH1 - BH4) taken at Barnageeragh Cove, Skerries, Co. Dublin (2.8.2017)**

| | | Cations | | | | Anions | | | Balance | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Elec. Cond. ($\mu Scm^{-1}$) | $Ca^{2+}$ (meq $L^{-1}$) | $Mg^{2+}$ (meq $L^{-1}$) | $Na^{+}$ (meq $L^{-1}$) | $K^{+}$ (meq $L^{-1}$) | $Cl^{-}$ (meq $L^{-1}$) | $SO_4^{2-}$ (meq $L^{-1}$) | $HCO_3^{-}$ (meq $L^{-1}$) | $\sum^{+}$ (meq $L^{-1}$) | $\sum^{-}$ (meq $L^{-1}$) | % Ion Balance Error | pH |
| WA-BH8-01 | 1000 | 8.98 | 3.62 | 1.91 | 0.18 | 1.72 | 4.16 | 7.29 | 14.70 | 13.18 | 5.45 | 7.9 |
| WA-BH9-01 | 1100 | 9.48 | 4.11 | 1.74 | 0.15 | 1.64 | 2.08 | 9.18 | 15.48 | 12.89 | 9.11 | 7.8 |
| WA-BH10-01 | 1400 | 13.97 | 3.13 | 1.87 | 0.19 | 1.64 | 1.52 | 10.82 | 19.16 | 13.98 | 15.64 | 7.4 |
| WA-BH11-01 | 2100 | 17.47 | 8.22 | 4.35 | 2.33 | 3.95 | 4.79 | 15.06 | 32.36 | 23.80 | 15.26 | 7.2 |
| WA-BH12-01 | 1400 | 10.48 | 3.78 | 2.22 | 0.82 | 2.00 | 5.00 | 8.47 | 17.30 | 15.47 | 5.58 | 7.6 |
| WA-BH13-01 | 960 | 9.48 | 2.71 | 1.30 | 0.17 | 1.04 | 2.29 | 7.76 | 13.67 | 11.10 | 10.37 | 7.7 |

# Table A18.13. Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH14 at Barnegeernagh Cove, Skerries, (15.11.17)

| CHEMICAL SUBGROUPING | | Aliphatics | | | | | | | | | Aromatics | | | | | | | | | Total Petroleum Hydrocarbons (EPH (C8-C40)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | EC C5-C6 | EC>C6-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aliphatics | EC C5-C7 | EC>C7-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aromatics | |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | - | - | - | - | - | - | - | 600 | - | - | - | - | - | - | - | - | - | - |
| | Dutch Target Level | - | - | - | - | - | - | - | - | 50 | - | - | - | - | - | - | - | - | - | - |
| World Health Organisation Standard | Guideline Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SI No. 81 of 1988 - EC Regs (Quality of water intended for human consumption). | MACs | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SI No. 439 of 2000 - EC Drinking Water Regs. | Parametric Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'. | Guideline Values (IGVs) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 |
| EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010 | Threshold Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.5 |
| UK Technical and Advisory Group on the WFD, River Management Plan 2015 - 2021 | Recommended Standards for Hazardous Substances (Groundwater) | | | | | | | | | | | | | | | | | | | - |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Minimum Threshold Value | | | | | | | | | | | | | | | | | | | - |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Maximum Threshold Value | | | | | | | | | | | | | | | | | | | - |
| DAY SAMPLED | GROUNDWATER WELLS | | | | | | | | - | | | | | | | | | | | |
| | WA-BH1-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH2-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH3-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH4-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH8-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH9-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH10-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH11-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH12-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH13-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH14-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |



Notes:

553 Values are underlined wherever Dutch-TV is exceeded

553 Values are shaded yellow and in bold wherever Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are exceeded

- '-' signifies analysis not carried out on sample or no Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are available.

# Table A18.13. Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-BH14 at Barnegeernagh Cove, Skerries, (15.11.17)

| CHEMICAL SUBGROUPING | | Petrol Range Organics | | | | | | | | Polyaromatic Hydrocarbons (PAHS) | | | | | | | | | | | | | | | | Total Cyanide | Total Phenols |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | MTBE | Benzene | Toluene | Ethylbenzene | m-/p-Xylene | o-Xylene | Total Xylene | TOTAL BTEX | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)+ Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(123cd)pyrene | Dibenzo(ah)anthracene | Benzo(ghi)perylene | Total 16 EPA PAHs | | |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | 30 | 1000 | 150 | 70 | 70 | 70 | - | 70 | - | - | - | 5 | 5 | 1 | - | 0.5 | 0.2 | 0.05 | 0.05 | 0.05 | - | 0.05 | - | - | - |
| | Dutch Target Level | - | 0.2 | 7 | 4 | 0.2 | 0.2 | 0.2 | - | 0.01 | - | - | - | 0.003 | 0.0007 | 0.003 | - | 0.0001 | 0.003 | 0.0004 | 0.0005 | 0.0004 | - | 0.0003 | - | - | - |
| World Health Organisation Standard | Guideline Values | 30 | 10 | 700 | 300 | - | - | 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 | - |
| SI No. 81 of 1988 - EC Regs (Quality of water intended for human consumption). | MACs | - | - | 0.2 | 0.2 | 0.2 | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| SI No. 439 of 2000 - EC Drinking Water Regs. | Parametric Values | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'. | Guideline Values (IGVs) | 30 | 1 | 10 | 10 | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 | 0.5 |
| EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010 | Threshold Values | 10 | 0.75 | 525 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0075 | - | - | - | 0.075 | 37.5 | - |
| UK Technical and Advisory Group on the WFD, River Management Plan 2015 - 2021 | Recommended Standards for Hazardous Substances (Groundwater) | - | 1 | 4 | - | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Minimum Threshold Value | - | 10.1 | 51 | - | 30.3 | - | - | - | 2.4 | - | - | - | - | 0.1 | 0.1 | - | - | - | - | - | - | - | - | - | | |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Maximum Threshold Value | - | 55.2 | 276 | - | 166 | - | - | - | 13.2 | - | - | - | - | 0.55 | 0.6 | - | - | - | - | - | - | - | - | - | | |
| DAY SAMPLED | GROUNDWATER WELLS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | WA-BH1-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH2-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH3-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH4-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH8-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH9-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH10-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH11-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH12-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH13-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |
| | WA-BH14-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 | <30 |



Notes:

553 Values are underlined wherever Dutch-TV is exceeded

**553** Values are shaded yellow and in bold wherever Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are exceeded

\- '-' signifies analysis not carried out on sample or no Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are available.

# Table A18.14 Results of Volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-4 and BH8-14 at Barnegeernagh Cove, Skerries, Co. Dublin (15.11.17)

| Parameters | Units | Standards | | | Guidelines | | Analytical Results | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010 THRESHOLD VALUES | WA-BH1-01 | WA-BH2-01 | WA-BH3-01 | WA-BH4-01 | WA-BH8-01 | WA-BH9-01 | WA-BH10-01 | WA-BH11-01 | WA-BH12-01 | WA-BH13-01 | WA-BH14-01 |
| Dichlorodifluoromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Chloromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Vinyl Chloride | mg/l | 0.0005 | 0.00001 | 0.00500 | - | 0.000375 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromomethane | mg/l | 0.0005 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chloroethane | mg/l | 0.0005 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Trichlorofluoromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| trans-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Dichloromethane | mg/l | - | 0.00001 | 1.00000 | 0.01 | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Carbon disulphide | mg/l | 0.0005 | - | - | - | - | | | | | | | | | | | |
| 1,1-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloroethane | mg/l | 0.0005 | 0.00700 | 0.90000 | 0.03 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| tert-butyl methyl ether | mg/l | 0.0005 | - | 9.20000 | 0.03 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| cis-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromochloromethane | mg/l | 0.1 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chloroform | mg/l | 0.1 | 0.00600 | 0.40000 | 0.012 | - | | | | | | | | | | | |
| 2,2-Dichloropropane | mg/l | 0.1 | 0.00080 | 0.08000 | - | - | | | | | | | | | | | |
| 1,2-Dichloroethane | mg/l | 0.1 | 0.00700 | 0.40000 | 0.003 | 0.00225 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| 1,1,1-Trichloroethane | mg/l | - | 0.00001 | 0.30000 | 0.5 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloropropene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Benzene | mg/l | - | 0.00020 | 0.03000 | 0.001 | 0.00075 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Carbontetrachloride | mg/l | - | - | - | - | - | | | | | | | | | | | |
| Dibromomethane | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,2-Dichloropropane | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromodichloromethane | mg/l | 0.0002 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Trichloroethene | mg/l | 0.0002 | 0.02400 | 0.50000 | 0.07 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Trichloromethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Tetrachloromethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Tribromomethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| cis-1,3-Dichloropropene | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| trans-1,3-Dichloropropene | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,1,2-Trichloroethane | mg/l | 0.0002 | 0.00001 | 0.13000 | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Toluene | mg/l | 0.0002 | 0.00700 | 1.00000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichloropropane | mg/l | 0.0002 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Dibromochloromethane | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromoethane | mg/l | 0.0002 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Tetrachloroethene | mg/l | 0.0002 | 0.0000100 | 0.04000 | 0.002 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0002 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Chlorobenzene | mg/l | 0.0002 | 0.0070000 | 0.18000 | 0.001 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.0002 | 0.0040000 | 0.15000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| p/m-Xylene | mg/l | 0.0002 | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromoform | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Styrene | mg/l | 0.0002 | 0.00600 | 0.30000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,2,2-Tetrachloroethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| o-Xylene | mg/l | - | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichloropropane | mg/l | - | - | - | - | - | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Isopropylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromobenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 2-Chlorotoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Propylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Chlorotoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,4-Trimethylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Isopropyltoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3,5-Trimethylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,4-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| sec-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| tert-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | 0.003 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| n-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromo-3-chloropropane | mg/l | 0.1 | - | - | - | - | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| 1,2,4-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | 0.0004 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Hexachlorobutadiene | mg/l | - | - | - | 0.0001 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |



Notes:

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded |
| - | '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available |

# Table A18.15. Results of Semi-volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-4 and BH8-14 at Barnegeernagh Cove, Skerries, Co. Dublin (15.11.17)

| Parameters | Units | Standards | | | Guidelines | | Analytical Results | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010. THRESHOLD VALUES | WA-BH1-01 | WA-BH2-01 | WA-BH3-01 | WA-BH4-01 | WA-BH8-01 | WA-BH9-01 | WA-BH10-01 | WA-BH11-01 | WA-BH12-01 | WA-BH13-01 | WA-BH14-01 |
| Phenol | mg/l | 0.0005 | 0.20000 | 2.00000 | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methyl-4,6-Dinitrophenol | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Chlorophenol | mg/l | 0.0005 | 0.00030 | 0.10000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dichlorophenol | mg/l | 0.0005 | 0.00020 | 0.03000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dimethylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloro-3-methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4,6-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4,5-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Pentachlorophenol | mg/l | 0.0005 | 0.00004 | 0.00300 | 0.00200 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitrophenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitrophenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,3-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,4-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,2-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,2,4-Trichlorobenzene | mg/l | 0.1 | 0.00001 | 0.01000 | 0.00040 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Nitrobenzene | mg/l | - | - | - | 0.01000 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Azobenzene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobenzene | mg/l | - | 0.00000009 | 0.00050 | 0.00003 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthylene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Fluorene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Pyrene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(b)fluoranthrene | mg/l | 0.0002 | - | - | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Naphthalene | mg/l | 0.0002 | 0.00001 | 0.07000 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Anthracene | mg/l | 0.0002 | 0.000007 | 0.00500 | 10.00000 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Phenanthrene | mg/l | 0.0002 | 0.000003 | 0.00500 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Fluoranthrene | mg/l | 0.0002 | 0.000003 | 0.00100 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)anthracene | mg/l | 0.0002 | 0.0000001 | 0.00050 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Chrysene | mg/l | 0.0002 | 0.0000030 | 0.00020 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)pyrene | mg/l | 0.0002 | 0.0000005 | 0.00005 | 0.00001 | 0.000000075 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(ghi)perylene | mg/l | 0.0002 | 0.0000003 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(k)fluoranthrene | mg/l | 0.0002 | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.0002 | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dibenzo(a,h)anthracene | mg/l | 0.0002 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Chloronaphthalene | mg/l | 0.0002 | - | 0.006 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylnaphthalene | mg/l | 0.0002 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Carbazole | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Isophorone | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dibenzofuran | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dimethyl phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Diethyl phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Di-n-butylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Di-n-octylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-ethylhexyl)phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Butylbenzylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloroaniline | mg/l | - | - | 0.030 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitroanaline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 3-Nitroaniline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitroaniline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| N-Nitrosodimethylamine | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dinitrotoluene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,6-Dinitrotoluene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethyl)ether | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-Chloroisopropyl)Ether | mg/l | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Bromophenylphenylether | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chlorophenylphenylether | mg/l | 0.1 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachloroethane | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobutadiene | mg/l | - | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexchlorocyclopentadiene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethoxy)methane | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| N-nitrosodi-n-propylamine | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| | | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |



Notes:

553 — Values are underlined wherever Dutch-TV is exceeded

**553** — Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded

\- — '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available

**Table A18.16. Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Groundwater Samples taken from Groundwater Monitoring Wells BH1-4 and BH8 - BH14 at Barnageeragh Cove, Skerries, Co. Dublin (15.11.17)**

| Parameters | Units | Guidelines | Standards | | GROUNDWATER | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | WA-BH1-01 | WA-BH2-01 | WA-BH3-01 | WA-BH4-01 | WA-BH8-01 | WA-BH9-01 | WA-BH10-01 |
| Trifluralin | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Endosulfan I | µg/l | 0.1 | 0.0002 | 0.005 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| *Aldrin* | µg/l | 0.1 | 0.000009 | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| *Dieldrin* | µg/l | 0.1 | 0.00004 | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Endosulfan II | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Gamma-HCH (Lindane) | µg/l | - | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Dichlorprop | µg/l | 0.1 | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Mecoprop | µg/l | 0.1 | | - | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Atrazine | µg/l | 0.1 | | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Simazne | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |



Notes:

As New Dutch Criteria have no chlorinated pesticide standards, old standards are referenced.

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in RED bold wherever Dutch-IV and/or SI No. 81 of 1988 MACs are exceeded |
| - | -' signifies analysis not carried out on sample or no Dutch Criteria is available. |

**Table A18.17. Major Ion Balance on Groundwater Samples (BH1 - BH4 and BH8-BH14) taken at Barnageeragh Cove, Skerries, Co. Dublin (15.11.2017)**

| | | Cations | | | | Anions | | | Balance | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Elec. Cond. ($\mu Scm^{-1}$) | $Ca^{2+}$ (meq $L^{-1}$) | $Mg^{2+}$ (meq $L^{-1}$) | $Na^{+}$ (meq $L^{-1}$) | $K^{+}$ (meq $L^{-1}$) | $Cl^{-}$ (meq $L^{-1}$) | $SO_4^{2-}$ (meq $L^{-1}$) | $HCO_3^{-}$ (meq $L^{-1}$) | $\sum^{+}$ (meq $L^{-1}$) | $\sum^{-}$ (meq $L^{-1}$) | % Ion Balance Error | pH |
| WA-BH1-01 | 10000 | 36.93 | 78.13 | 60.88 | 23.79 | 62.05 | 66.63 | 11.76 | 199.72 | 140.44 | 17.43 | 7.9 |
| WA-BH2-01 | 690 | 7.49 | 3.37 | 2.04 | 0.54 | 1.04 | 1.15 | 6.59 | 13.44 | 8.78 | 20.98 | 7.8 |
| WA-BH3-01 | 1800 | 16.97 | 4.93 | 2.48 | 0.77 | 2.03 | 10.20 | 7.76 | 25.15 | 20.00 | 11.41 | 7.6 |
| WA-BH4-01 | 1900 | 16.97 | 8.14 | 3.61 | 1.28 | 3.38 | 2.29 | 15.29 | 30.00 | 20.97 | 17.71 | 7.3 |
| WA-BH8-01 | 1000 | 8.98 | 3.62 | 1.91 | 0.18 | 1.72 | 4.16 | 7.29 | 14.70 | 13.18 | 5.45 | 7.9 |
| WA-BH9-01 | 1100 | 9.48 | 4.11 | 1.74 | 0.15 | 1.64 | 2.08 | 9.18 | 15.48 | 12.89 | 9.11 | 7.8 |
| WA-BH10-01 | 1400 | 13.97 | 3.13 | 1.87 | 0.19 | 1.64 | 1.52 | 10.82 | 19.16 | 13.98 | 15.64 | 7.4 |
| WA-BH11-01 | 2100 | 17.47 | 8.22 | 4.35 | 2.33 | 3.95 | 4.79 | 15.06 | 32.36 | 23.80 | 15.26 | 7.2 |
| WA-BH12-01 | 1400 | 10.48 | 3.78 | 2.22 | 0.82 | 2.00 | 5.00 | 8.47 | 17.30 | 15.47 | 5.58 | 7.6 |
| WA-BH13-01 | 960 | 9.48 | 2.71 | 1.30 | 0.17 | 1.04 | 2.29 | 7.76 | 13.67 | 11.10 | 10.37 | 7.7 |
| WA-BH14-01 | 680 | 6.49 | 2.38 | 1.09 | 0.13 | 0.90 | 0.81 | 6.59 | 10.09 | 8.30 | 9.70 | 7.9 |

# Table A18.18. Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH, Cyanide and Phenol analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-4 and BH8-17 at Barnegeernagh Cove, Skerries, (24.05.18)

| CHEMICAL SUBGROUPING | | Aliphatics | | | | | | | | | Aromatics | | | | | | | | | Total Petroleum Hydrocarbons (EPH (C8-C40)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | EC C5-C6 | EC>C6-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aliphatics | EC C5-C7 | EC>C7-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aromatics | |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | - | - | - | - | - | - | - | 600 | - | - | - | - | - | - | - | - | - | - |
| | Dutch Target Level | - | - | - | - | - | - | - | - | 50 | - | - | - | - | - | - | - | - | - | - |
| World Health Organisation Standard | Guideline Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SI No. 81 of 1988 - EC Regs (Quality of water intended for human consumption). | MACs | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SI No. 439 of 2000 - EC Drinking Water Regs. | Parametric Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'. | Guideline Values (IGVs) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 |
| EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010 | Threshold Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.5 |
| UK Technical and Advisory Group on the WFD, River Management Plan 2015 - 2021 | Recommended Standards for Hazardous Substances (Groundwater) | | | | | | | | | | | | | | | | | | | - |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Min TV | Minimum Threshold Value | | | | | | | | | | | | | | | | | | | - |
| The River Basin Districts Typology, Standards and Groundwater Threshold Values (WFD) (England and Wales) Directions 2010, Groundwater Impacts on Surface Water Max TV | Maximum Threshold Value | | | | | | | | | | | | | | | | | | | - |
| DAY SAMPLED | GROUNDWATER WELLS | | | | | | | | - | | | | | | | | | | | |
| | WA-BH1-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH2-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH3-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH4-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH8-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH9-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH10-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH11-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH12-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH13-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH14-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH15-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH16-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-BH17-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |



Notes:

553 Values are underlined wherever Dutch-TV is exceeded

553 Values are shaded yellow and in bold wherever Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are exceeded

- '-' signifies analysis not carried out on sample or no Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are available.

# Table A18.19. Results of Volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-4 and BH8-17 at Barnegeernagh Cove, Skerries, Co. Dublin (24.5.18)

| Parameters | Units | Standards | | | Guidelines | | Analytical Results | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010 THRESHOLD VALUES | WA-BH1-01 | WA-BH2-01 | WA-BH3-01 | WA-BH4-01 | WA-BH8-01 | WA-BH9-01 | WA-BH10-01 | WA-BH11-01 | WA-BH12-01 | WA-BH13-01 | WA-BH14-01 | WA-BH15-01 | WA-BH16-01 | WA-BH17-01 |
| Dichlorodifluoromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Chloromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Vinyl Chloride | mg/l | 0.0005 | 0.00001 | 0.00500 | - | 0.000375 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromomethane | mg/l | 0.0005 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chloroethane | mg/l | 0.0005 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Trichlorofluoromethane | mg/l | 0.0005 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| trans-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Dichloromethane | mg/l | - | 0.00001 | 1.00000 | 0.01 | - | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Carbon disulphide | mg/l | 0.0005 | - | - | - | - | | | | | | | | | | | | | | |
| 1,1-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloroethane | mg/l | 0.0005 | 0.00700 | 0.90000 | 0.03 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| tert-butyl methyl ether | mg/l | 0.0005 | - | 9.20000 | 0.03 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| cis-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromochloromethane | mg/l | 0.1 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chloroform | mg/l | 0.1 | 0.00600 | 0.40000 | 0.012 | - | | | | | | | | | | | | | | |
| 2,2-Dichloropropane | mg/l | 0.1 | 0.00080 | 0.08000 | - | - | | | | | | | | | | | | | | |
| 1,2-Dichloroethane | mg/l | 0.1 | 0.00700 | 0.40000 | 0.003 | 0.00225 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| 1,1,1-Trichloroethane | mg/l | - | 0.00001 | 0.30000 | 0.5 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloropropene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Benzene | mg/l | - | 0.00020 | 0.03000 | 0.001 | 0.00075 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Carbontetrachloride | mg/l | - | - | - | - | - | | | | | | | | | | | | | | |
| Dibromomethane | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,2-Dichloropropane | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromodichloromethane | mg/l | 0.0002 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Trichloroethene | mg/l | 0.0002 | 0.02400 | 0.50000 | 0.07 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Trichloromethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Tetrachloromethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Tribromomethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| cis-1,3-Dichloropropene | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| trans-1,3-Dichloropropene | mg/l | 0.0002 | - | - | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 1,1,2-Trichloroethane | mg/l | 0.0002 | 0.00001 | 0.13000 | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Toluene | mg/l | 0.0002 | 0.00700 | 1.00000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichloropropane | mg/l | 0.0002 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Dibromochloromethane | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromoethane | mg/l | 0.0002 | - | - | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Tetrachloroethene | mg/l | 0.0002 | 0.0000100 | 0.04000 | 0.002 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0002 | - | - | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Chlorobenzene | mg/l | 0.0002 | 0.0070000 | 0.18000 | 0.001 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.0002 | 0.0040000 | 0.15000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| p/m-Xylene | mg/l | 0.0002 | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromoform | mg/l | 0.0002 | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Styrene | mg/l | 0.0002 | 0.00600 | 0.30000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,1,2,2-Tetrachloroethane | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| o-Xylene | mg/l | - | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichloropropane | mg/l | - | - | - | - | - | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Isopropylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Bromobenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 2-Chlorotoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Propylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Chlorotoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,4-Trimethylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 4-Isopropyltoluene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3,5-Trimethylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,3-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,4-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| sec-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| tert-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | 0.003 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| n-Butylbenzene | mg/l | - | - | - | - | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromo-3-chloropropane | mg/l | 0.1 | - | - | - | - | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| 1,2,4-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | 0.0004 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | - | - | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| Hexachlorobutadiene | mg/l | - | - | - | 0.0001 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

Notes:

553 — Values are underlined wherever Dutch-TV is exceeded

**553** — Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded

\- — '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available

# Table A18.20. Results of Semi-volatile Organic Compound laboratory analysis on groundwater samples taken from Groundwater Monitoring Wells BH1-4 and BH8-17 at Barnegeernagh Cove, Skerries, Co. Dublin (24.05.18)

| Parameters | Units | Standards | | | Guidelines | | Analytical Results | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010. THRESHOLD VALUES | WA-BH1-01 | WA-BH2-01 | WA-BH3-01 | WA-BH4-01 | WA-BH8-01 | WA-BH9-01 | WA-BH10-01 | WA-BH11-01 | WA-BH12-01 | WA-BH13-01 | WA-BH14-01 | WA-BH15-01 | WA-BH16-01 | WA-BH17-01 |
| Phenol | mg/l | 0.0005 | 0.20000 | 2.00000 | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methyl-4,6-Dinitrophenol | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Chlorophenol | mg/l | 0.0005 | 0.00030 | 0.10000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dichlorophenol | mg/l | 0.0005 | 0.00020 | 0.03000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dimethylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloro-3-methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4,6-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4,5-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Pentachlorophenol | mg/l | 0.0005 | 0.00004 | 0.00300 | 0.00200 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Methylphenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitrophenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitrophenol | mg/l | 0.0005 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,3-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,4-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,2-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 1,2,4-Trichlorobenzene | mg/l | 0.1 | 0.00001 | 0.01000 | 0.00040 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Nitrobenzene | mg/l | - | - | - | 0.01000 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Azobenzene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobenzene | mg/l | - | 0.00000009 | 0.00050 | 0.00003 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthylene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Fluorene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Pyrene | mg/l | 0.0002 | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(b)fluoranthrene | mg/l | 0.0002 | - | - | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Naphthalene | mg/l | 0.0002 | 0.00001 | 0.07000 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Anthracene | mg/l | 0.0002 | 0.000007 | 0.00500 | 10.00000 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Phenanthrene | mg/l | 0.0002 | 0.000003 | 0.00500 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Fluoranthrene | mg/l | 0.0002 | 0.000003 | 0.00100 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)anthracene | mg/l | 0.0002 | 0.0000001 | 0.00050 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Chrysene | mg/l | 0.0002 | 0.0000030 | 0.00020 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)pyrene | mg/l | 0.0002 | 0.0000005 | 0.00005 | 0.00001 | 0.0000000075 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(ghi)perylene | mg/l | 0.0002 | 0.0000003 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(k)fluoranthrene | mg/l | 0.0002 | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.0002 | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dibenzo(a,h)anthracene | mg/l | 0.0002 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Chloronaphthalene | mg/l | 0.0002 | - | 0.006 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylnaphthalene | mg/l | 0.0002 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Carbazole | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Isophorone | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dibenzofuran | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Dimethyl phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Diethyl phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Di-n-butylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Di-n-octylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-ethylhexyl)phthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Butylbenzylphthalate | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloroaniline | mg/l | - | - | 0.030 | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitroanaline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 3-Nitroaniline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitroaniline | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| N-Nitrosodimethylamine | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dinitrotoluene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 2,6-Dinitrotoluene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethyl)ether | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-Chloroisopropyl)Ether | mg/l | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Bromophenylphenylether | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 4-Chlorophenylphenylether | mg/l | 0.1 | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachloroethane | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobutadiene | mg/l | - | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Hexchlorocyclopentadiene | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethoxy)methane | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| N-nitrosodi-n-propylamine | mg/l | - | - | - | - | - | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| | | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |



Notes:

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded |
| - | '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available |

**Table A18.21. Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Groundwater Samples taken from Groundwater Monitoring Wells BH1-4 and BH8 - BH17 at Barnageeragh Cove, Skerries, Co. Dublin (25.5.18)**

| Parameters | Units | Guidelines | Standards | | GROUNDWATER | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | WA-BH1-01 | WA-BH2-01 | WA-BH3-01 | WA-BH4-01 | WA-BH8-01 | WA-BH9-01 | WA-BH10-01 | WA-BH11-01 | WA-BH12-01 | WA-BH13-01 | WA-BH14-01 | WA-BH15-01 | WA-BH16-01 | WA-BH17-01 |
| Trifluralin | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Endosulfan I | µg/l | 0.1 | 0.0002 | 0.005 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| *Aldrin* | µg/l | 0.1 | 0.000009 | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| *Dieldrin* | µg/l | 0.1 | 0.00004 | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Endosulfan II | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Gamma-HCH (Lindane) | µg/l | - | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Dichlorprop | µg/l | 0.1 | - | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Mecoprop | µg/l | 0.1 | - | - | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Atrazine | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Simazne | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |

Notes:

As New Dutch Criteria have no chlorinated pesticide standards, old standards are referenced.

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in RED bold wherever Dutch-IV and/or SI No. 81 of 1988 MACs are exceeded |
| - | -' signifies analysis not carried out on sample or no Dutch Criteria is available. |

**Table A18.22. Major Ion Balance on Groundwater Samples (BH1 - BH4 and BH8-BH17) taken at Barnageeragh Cove, Skerries, Co. Dublin (25.05.2017)**

| | | Cations | | | | Anions | | | Balance | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Elec. Cond. ($\mu Scm^{-1}$) | $Ca^{2+}$ (meq $L^{-1}$) | $Mg^{2+}$ (meq $L^{-1}$) | $Na^{+}$ (meq $L^{-1}$) | $K^{+}$ (meq $L^{-1}$) | $Cl^{-}$ (meq $L^{-1}$) | $SO_4^{2-}$ (meq $L^{-1}$) | $HCO_3^{-}$ (meq $L^{-1}$) | $\sum^{+}$ (meq $L^{-1}$) | $\sum^{-}$ (meq $L^{-1}$) | % Ion Balance Error | pH |
| WA-BH1-01 | 7800 | 17.96 | 33.72 | 24.79 | 13.04 | 36.66 | 49.97 | 16.47 | 89.51 | 103.10 | -7.06 | 8.0 |
| WA-BH2-01 | 720 | 9.48 | 2.71 | 1.09 | 0.17 | 1.13 | 1.33 | 8.00 | 13.45 | 10.46 | 12.50 | 8.0 |
| WA-BH3-01 | 1800 | 21.46 | 4.36 | 2.48 | 1.02 | 1.92 | 12.49 | 8.47 | 29.32 | 22.88 | 12.33 | 7.9 |
| WA-BH4-01 | 1900 | 10.48 | 3.95 | 2.09 | 0.16 | 2.54 | 2.71 | 20.00 | 16.67 | 25.24 | -20.45 | 7.7 |
| WA-BH8-01 | 1100 | 8.98 | 3.70 | 1.91 | 0.15 | 1.75 | 3.75 | 9.41 | 14.75 | 14.91 | -0.53 | 7.9 |
| WA-BH9-01 | 1200 | 9.98 | 4.52 | 1.87 | 0.12 | 1.81 | 2.50 | 11.76 | 16.49 | 16.07 | 1.31 | 8.1 |
| WA-BH10-01 | 1500 | 16.47 | 3.29 | 1.39 | 0.13 | 1.33 | 0.54 | 14.82 | 21.28 | 16.69 | 12.09 | 7.3 |
| WA-BH11-01 | 2600 | 19.96 | 10.69 | 6.09 | 3.07 | 5.08 | 8.95 | 18.59 | 39.81 | 32.62 | 9.93 | 7.5 |
| WA-BH12-01 | 1500 | 11.98 | 4.03 | 2.52 | 0.69 | 2.43 | 6.25 | 10.12 | 19.22 | 18.79 | 1.13 | 7.9 |
| WA-BH13-01 | 820 | 8.48 | 1.64 | 0.91 | 0.08 | 0.79 | 1.04 | 8.47 | 11.12 | 10.30 | 3.82 | 7.9 |
| WA-BH14-01 | 1800 | 15.97 | 6.09 | 2.91 | 1.30 | 2.26 | 4.79 | 15.06 | 26.27 | 22.10 | 8.62 | 7.2 |
| WA-BH15-01 | 710 | 6.49 | 2.30 | 1.00 | 0.10 | 0.99 | 0.94 | 8.00 | 9.89 | 9.92 | -0.16 | 8.0 |
| WA-BH16-01 | 1100 | 10.98 | 3.62 | 1.13 | 0.18 | 1.18 | 3.12 | 10.59 | 15.90 | 14.90 | 3.27 | 7.8 |
| WA-BH17-01 | 850 | 7.98 | 1.73 | 1.00 | 0.07 | 1.24 | 2.02 | 8.71 | 10.78 | 11.97 | -5.20 | 8.1 |

# SURFACE WATER RESULTS TABLES

| TABLE NO. | TABLE DESCRIPTION |
|---|---|
| A18.23 | Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH and Cyanide analysis on Surface Water Samples taken from SW1, SW2 and SW3 at Barnageeragh Cove, Skerries, Co. Dublin (11.01.18) |
| A18.24 | Results of Volatile Organic Compound laboratory analysis on Surface Water Samples taken from SW1, SW2 and SW3 at Barnageeragh Cove, Skerries, Co. Dublin (11.01.18) |
| A18.25 | Results of Semi-volatile Organic Compound laboratory analysis on Surface Water Samples taken from SW1, SW2 and SW3 at Barnageeragh Cove, Skerries, Co. Dublin (11.01.18) |
| A18.26 | Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Surface Water Samples taken from SW1, SW2 and SW3 at Barnageeragh Cove, Skerries, Co. Dublin (11.01.18) |
| A18.27 | Major Ion Balance on Surface Water Samples (SW1-SW3) taken from Adjacent Stream at Barnageeragh Cove, Skerries, Co. Dublin (11.01.18) |
| A18.28 | Results of TPH-CWG, MTBE/BTEX and PAH Analysis on Surface Water Samples SW1 and SW4 from Adjacent Stream at Barnageeragh Cove, Skerries, Co. Dublin (15.06.18) |
| A18.29 | Results of Volatile Organic Compound Laboratory Analysis on Surface Water Samples SW1 and SW4 taken from Adjacent Stream, Barnageeragh Cove, Skerries, Co. Dublin (15.06.18) |
| A18.30 | Results of Semi-volatile Organic Compound Laboratory Analysis on Surface Water Samples SW1 and SW4 taken from Adjacent Stream, Barnageeragh Cove, Skerries, Co. Dublin (15.06.18) |
| A18.31 | Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Surface Water Samples taken from SW1 and SW4 at Barnageeragh Cove, Skerries, Co. Dublin (15.06.18) |
| A18.32 | Major Ion Balance on Surface Water Samples SW1 and SW4 taken from Adjacent Stream at Barnageeragh Cove, Skerries, Co. Dublin (15.06.18) |

# Table A18.23. Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH and Cyanide analysis on Surface Water Samples taken from SW1, SW2 and SW3 at Barnageeragh Cove, Skerries on 11th January, 2018

| CHEMICAL SUBGROUPING | | Aliphatics | | | | | | | | | Aromatics | | | | | | | | | Total Petroleum Hydrocarbons (EPH (C8-C40)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | EC C5-C6 | EC>C6-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aliphatics | EC C5-C7 | EC>C7-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aromatics | |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | - | - | - | - | - | | - | 600 | - | - | - | - | - | - | - | - | - | - |
| | Dutch Target Level | - | - | - | - | - | - | | - | 50 | - | - | - | - | - | - | - | - | - | - |
| World Health Organisation Standard | Guideline Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'. | Guideline Values (IGVs) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 |
| EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010 | Threshold Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.5 |
| | WA-SW1-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-SW2-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |
| | WA-SW3-01 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <5.0 | <10 |



Notes:

553 Values are underlined wherever Dutch-TV is exceeded

553 Values are shaded yellow and in bold wherever Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are exceeded

- '-' signifies analysis not carried out on sample or no Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are available.

## Table A18.23. Results of Total Petroleum Hydrocarbon (TPH), MTBE/BTEX, PAH and Cyanide analysis on Surface Water Samples taken from SW1, SW2 and SW3 at Barnageeragh Cove, Skerries on 11th January, 2018

| CHEMICAL SUBGROUPING | | Petrol Range Organics | | | | | | | | Polyaromatic Hydrocarbons (PAHS) | | | | | | | | | | | | | | | | Cyanide |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | MTBE | Benzene | Toluene | Ethylbenzene | m-/p-Xylene | o-Xylene | Total Xylene | TOTAL BTEX | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)+ Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(123cd)pyrene | Dibenzo(ah)anthracene | Benzo(ghi)perylene | Total 16 EPA PAHs | Total Cyanide |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | 30 | 1000 | 150 | 70 | 70 | 70 | - | 70 | | - | - | 5 | 5 | 1 | - | 0.5 | 0.2 | 0.05 | 0.05 | 0.05 | - | 0.05 | - | - |
| | Dutch Target Level | - | 0.2 | 7 | 4 | 0.2 | 0.2 | 0.2 | - | 0.01 | | - | - | 0.003 | 0.0007 | 0.003 | - | 0.0001 | 0.003 | 0.0004 | 0.0005 | 0.0004 | - | 0.0003 | - | - |
| World Health Organisation Standard | Guideline Values | 30 | 10 | 700 | 300 | - | - | 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 70 |
| EPA Guideline Values – From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'. | Guideline Values (IGVs) | 30 | 1 | 10 | 10 | - | - | 10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 |
| EC Environmental Objectives (Groundwater Regulations) S.I. 9, 2010 | Threshold Values | 10 | 0.75 | 525 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0075 | - | - | - | 0.075 | 37.5 |
| | WA-SW1-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 |
| | WA-SW2-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 |
| | WA-SW3-01 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <2.0 | <50 |

Notes:

Values are underlined wherever Dutch-TV is exceeded

553 Values are shaded yellow and in bold wherever Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are exceeded

\- '-' signifies analysis not carried out on sample or no Dutch-IV, WHO Standards, EPA Interim Guideline Values or SI 9, 2010 Threshold Levels are available.

# Table A18.24. Results of Volatile Organic Compound laboratory analysis on Surface Water Samples taken from SW1, SW2 and SW3 at Barnageeragh Cove, Skerries on 11th January, 2018

| Parameters | Units | Standards | | Guidelines | | Analytical Results | | |
|---|---|---|---|---|---|---|---|---|
| | | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010 THRESHOLD VALUES | WA-SW1-01 | WA-SW2-01 | WA-SW3-01 |
| Dichlorodifluoromethane | mg/l | - | - | - | - | < 0.001 | <0.001 | <0.001 |
| Chloromethane | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| Vinyl Chloride | mg/l | 0.00001 | 0.00500 | - | 0.000375 | <0.001 | <0.001 | <0.001 |
| Bromomethane | mg/l | - | - | - | - | <0.005 | <0.005 | <0.005 |
| Chloroethane | mg/l | - | - | - | - | <0.002 | <0.002 | <0.002 |
| Trichlorofluoromethane | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| trans-1,2-Dichloroethene | mg/l | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloroethene | mg/l | 0.00001 | 0.01000 | - | - | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloroethane | mg/l | 0.00700 | 0.90000 | 0.03 | - | <0.001 | <0.001 | <0.001 |
| tert-butyl methyl ether | mg/l | - | 9.20000 | 0.03 | - | <0.001 | <0.001 | <0.001 |
| cis-1,2-Dichloroethene | mg/l | 0.00001 | 0.02000 | - | - | <0.001 | <0.001 | <0.001 |
| Bromochloromethane | mg/l | - | - | - | - | <0.005 | <0.005 | <0.005 |
| 1,2-Dichloroethane | mg/l | 0.00700 | 0.40000 | 0.003 | 0.00225 | <0.002 | <0.002 | <0.002 |
| 1,1,1-Trichloroethane | mg/l | 0.00001 | 0.30000 | 0.5 | - | <0.001 | <0.001 | <0.001 |
| 1,1-Dichloropropene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| Benzene | mg/l | 0.00020 | 0.03000 | 0.001 | 0.00075 | <0.001 | <0.001 | <0.001 |
| Dibromomethane | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 1,2-Dichloropropane | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| Bromodichloromethane | mg/l | - | - | - | - | <0.005 | <0.005 | <0.005 |
| Trichloroethene | mg/l | 0.02400 | 0.50000 | 0.07 | - | <0.001 | <0.001 | <0.001 |
| Trichloromethane | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| Tetrachloromethane | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| Tribromomethane | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| cis-1,3-Dichloropropene | mg/l | - | - | - | - | <0.010 | <0.010 | <0.010 |
| trans-1,3-Dichloropropene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 1,1,2-Trichloroethane | mg/l | 0.00001 | 0.13000 | - | - | <0.010 | <0.010 | <0.010 |
| Toluene | mg/l | 0.00700 | 1.00000 | 0.01 | - | <0.001 | <0.001 | <0.001 |
| 1,3-Dichloropropane | mg/l | - | - | - | - | <0.002 | <0.002 | <0.002 |
| Dibromochloromethane | mg/l | - | - | - | - | <0.010 | <0.010 | <0.010 |
| 1,2-Dibromoethane | mg/l | - | - | - | - | <0.005 | <0.005 | <0.005 |
| Tetrachloroethene | mg/l | 0.0000100 | 0.04000 | 0.002 | - | <0.001 | <0.001 | <0.001 |
| 1,1,1,2-Tetrachloroethane | mg/l | - | - | - | - | <0.002 | <0.002 | <0.002 |
| Chlorobenzene | mg/l | 0.0070000 | 0.18000 | 0.001 | - | <0.001 | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.0040000 | 0.15000 | 0.01 | - | <0.001 | <0.001 | <0.001 |
| p/m-Xylene | mg/l | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 |
| Styrene | mg/l | 0.00600 | 0.30000 | - | - | <0.001 | <0.001 | <0.001 |
| o-Xylene | mg/l | 0.00020 | 0.07000 | 0.01 | - | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichloropropane | mg/l | - | - | - | - | <0.050 | <0.050 | <0.050 |
| Isopropylbenzene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| Bromobenzene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 2-Chlorotoluene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| Propylbenzene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 4-Chlorotoluene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 1,2,4-Trimethylbenzene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 4-Isopropyltoluene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 1,2,4-Trimethylbenzene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 1,3-Dichlorobenzene | mg/l | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 |
| 1,4-Dichlorobenzene | mg/l | 0.00300 | 0.05000 | - | - | <0.001 | <0.001 | <0.001 |
| sec-Butylbenzene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| tert-Butylbenzene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 1,2-Dichlorobenzene | mg/l | 0.00300 | 0.05000 | 0.003 | - | <0.001 | <0.001 | <0.001 |
| n-Butylbenzene | mg/l | - | - | - | - | <0.001 | <0.001 | <0.001 |
| 1,2-Dibromo-3-chloropropane | mg/l | - | - | - | - | <0.050 | <0.050 | <0.050 |
| 1,2,4-Trichlorobenzene | mg/l | 0.00001 | 0.01000 | 0.0004 | - | <0.001 | <0.001 | <0.001 |
| 1,2,3-Trichlorobenzene | mg/l | 0.00001 | 0.01000 | - | - | <0.002 | <0.002 | <0.002 |
| Hexachlorobutadiene | mg/l | - | - | 0.0001 | - | <0.001 | <0.001 | <0.001 |



| | |
|---|---|
| 553 | Notes: |
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| | Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded |
| - | '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available |

**Table A18.25. Results of Semi-volatile Organic Compound laboratory analysis on Surface Water Samples taken from SW1, SW2 and SW3 at Barnageeragh Cove, Skerries on 11th January, 2018**

| Parameters | Units | Standards | | Guidelines | | Analytical Results | | |
|---|---|---|---|---|---|---|---|---|
| | | Dutch Criteria Level TV | Dutch Criteria Level IV | EPA Guideline Values - From Interim Report on 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' INTERIM GUIDELINE VALUES | EC Environmental Objectives (Groundwater Regulations) Statutory Instrument No. 9, 2010. THRESHOLD VALUES | WA-SW1-01 | WA-SW2-01 | WA-SW3-01 |
| Phenol | mg/l | 0.20000 | 2.00000 | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 |
| 2-Methyl-4,6-Dinitrophenol | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2-Chlorophenol | mg/l | 0.00030 | 0.10000 | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dichlorophenol | mg/l | 0.00020 | 0.03000 | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dimethylphenol | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloro-3-methylphenol | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2,4,6-Trichlorophenol | mg/l | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2,4,5-Trichlorophenol | mg/l | 0.00001 | 0.01000 | - | - | <0.0005 | <0.0005 | <0.0005 |
| Pentachlorophenol | mg/l | 0.00004 | 0.00300 | 0.00200 | - | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylphenol | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 4-Methylphenol | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitrophenol | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitrophenol | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 1,3-Dichlorobenzene | mg/l | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 |
| 1,4-Dichlorobenzene | mg/l | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 |
| 1,2-Dichlorobenzene | mg/l | 0.00300 | 0.05000 | - | - | <0.0005 | <0.0005 | <0.0005 |
| 1,2,4-Trichlorobenzene | mg/l | 0.00001 | 0.01000 | 0.00040 | - | <0.0005 | <0.0005 | <0.0005 |
| Nitrobenzene | mg/l | - | - | 0.01000 | - | <0.0005 | <0.0005 | <0.0005 |
| Azobenzene | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobenzene | mg/l | 0.00000009 | 0.00050 | 0.00003 | - | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthylene | mg/l | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 |
| Acenaphthene | mg/l | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 |
| Fluorene | mg/l | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 |
| Pyrene | mg/l | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 |
| Benzo(b)fluoranthrene | mg/l | - | - | 0.00050 | - | <0.0005 | <0.0005 | <0.0005 |
| Naphthalene | mg/l | 0.00001 | 0.07000 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 |
| Anthracene | mg/l | 0.000007 | 0.00500 | 10.00000 | - | <0.0005 | <0.0005 | <0.0005 |
| Phenanthrene | mg/l | 0.000003 | 0.00500 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 |
| Fluoranthrene | mg/l | 0.000003 | 0.00100 | 0.00100 | - | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)anthracene | mg/l | 0.0000001 | 0.00050 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 |
| Chrysene | mg/l | 0.0000030 | 0.00020 | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 |
| Benzo(a)pyrene | mg/l | 0.0000005 | 0.00005 | 0.00001 | 0.000000075 | <0.0005 | <0.0005 | <0.0005 |
| Benzo(ghi)perylene | mg/l | 0.0000003 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 |
| Benzo(k)fluoranthrene | mg/l | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.0000004 | 0.00005 | 0.00005 | - | <0.0005 | <0.0005 | <0.0005 |
| Dibenzo(a,h)anthracene | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2-Chloronaphthalene | mg/l | - | 0.006 | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2-Methylnaphthalene | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Carbazole | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Isophorone | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Dibenzofuran | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Dimethyl phthalate | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Diethyl phthalate | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Di-n-butylphthalate | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Di-n-octylphthalate | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-ethylhexyl)phthalate | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Butylbenzylphthalate | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 4-Chloroaniline | mg/l | - | 0.030 | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2-Nitroanaline | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 3-Nitroaniline | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 4-Nitroaniline | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| N-Nitrosodimethylamine | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2,4-Dinitrotoluene | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 2,6-Dinitrotoluene | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethyl)ether | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-Chloroisopropyl)Ether | mg/l | | | | | <0.0005 | <0.0005 | <0.0005 |
| 4-Bromophenylphenylether | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| 4-Chlorophenylphenylether | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Hexachloroethane | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Hexachlorobutadiene | mg/l | - | - | 0.00010 | - | <0.0005 | <0.0005 | <0.0005 |
| Hexchlorocyclopentadiene | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| Bis(2-chloroethoxy)methane | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |
| N-nitrosodi-n-propylamine | mg/l | - | - | - | - | <0.0005 | <0.0005 | <0.0005 |



Notes:

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|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in bold wherever Dutch-IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values are exceeded |
| - | '-' = No Dutch TV or IV, EPA Interim Guideline Values or SI 9, 2010 Threshold Values available |

# Table A18.26. Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Surface Water Samples taken from SW1, SW2 and SW3 at Barnageeragh Cove, Skerries on 11th January, 2018

| Parameters | Units | Guidelines | Standards | | GROUNDWATER | | |
|---|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | WA-SW1-01 | WA-SW2-01 | WA-SW3-01 |
| Trifluralin | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 |
| Endosulfan I | µg/l | 0.1 | 0.0002 | 0.005 | <0.20 | <0.20 | <0.20 |
| *Aldrin* | µg/l | 0.1 | 0.000009 | - | <0.20 | <0.20 | <0.20 |
| *Dieldrin* | µg/l | 0.1 | 0.00004 | - | <0.20 | <0.20 | <0.20 |
| Endosulfan II | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 |
| Gamma-HCH (Lindane) | µg/l | - | - | - | <0.20 | <0.20 | <0.20 |
| Dichlorprop | µg/l | 0.1 | - | - | <0.010 | <0.010 | <0.010 |
| Mecoprop | µg/l | 0.1 | - | - | <0.40 | <0.40 | <0.40 |
| Atrazine | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 |
| Simazne | µg/l | 0.1 | - | - | <0.20 | <0.20 | <0.20 |



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| 553 |
| **553** |
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Notes:

As New Dutch Criteria have no chlorinated pesticide standards, old standards are referenced.

Values are underlined wherever Dutch-TV is exceeded

Values are shaded yellow and in RED bold wherever Dutch-IV and/or SI No. 81 of 1988 MACs are exceeded

-' signifies analysis not carried out on sample or no Dutch Criteria is available.

**Table A18.27. Major Ion Balance on Surface Water Samples (SW1-SW3) taken from Adjacent Stream on the 11.01.18**

| | | Cations | | | | Anions | | | Balance | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Elec. Cond. ($\mu Scm^{-1}$) | $Ca^{2+}$ (meq $L^{-1}$) | $Mg^{2+}$ (meq $L^{-1}$) | $Na^{+}$ (meq $L^{-1}$) | $K^{+}$ (meq $L^{-1}$) | $Cl^{-}$ (meq $L^{-1}$) | $SO_4^{2-}$ (meq $L^{-1}$) | $HCO_3^{-}$ (meq $L^{-1}$) | $\sum^{+}$ (meq $L^{-1}$) | $\sum^{-}$ (meq $L^{-1}$) | % Ion Balance Error | pH |
| WA-SW1-01 | 670 | 4.99 | 0.90 | 0.65 | 0.03 | 51.00 | 0.69 | 5.88 | 6.58 | 57.57 | -79.50 | 8.4 |
| WA-SW2-01 | 680 | 5.49 | 1.15 | 0.65 | 0.02 | 25.00 | 1.69 | 5.88 | 7.32 | 32.57 | -63.31 | 8.3 |
| WA-SW3-01 | 640 | 4.99 | 0.99 | 0.61 | 0.03 | 27.00 | 1.71 | 5.65 | 6.61 | 34.35 | -67.72 | 8.1 |

# Table A18.28. Results of TPH-CWG, MTBE/BTEX and PAH Analysis on Surface Water Samples SW1 and SW4 from Adjacent Stream at Barnageeragh Cove, Skerries on the 15th June, 2018

| CHEMICAL SUBGROUPING | | Aliphatics | | | | | | | | | Aromatics | | | | | | | | | Total Petroleum Hydrocarbons |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | EC C5-C6 | EC>C6-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aliphatics | EC C5-C7 | EC>C7-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aromatics | |
| | Units | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | ug/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | - | - | - | - | - | - | - | 600 | - | - | - | - | - | - | - | - | - | - |
| | Dutch Target Level | - | - | - | - | - | - | - | - | 50 | - | - | - | - | - | - | - | - | - | - |
| World Health Organisation Standard | Guideline Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| S.I. No. 294, European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations, 1989 | MACs | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| S.I. No. 278, European Communities Environmental Objectives (Drinking Water) (No. 2) Regulations, 2007 | Parametric Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| S.I. No. 272, European Communities Environmental Objectives (Surface Water) Regulations, 2009) | Threshold Values | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | SURFACE WATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 15.06.18 | SO-SW1-01 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 5.0 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 5.0 | < 10 |
| 15.06.18 | SO-SW4-01 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 5.0 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 5.0 | < 10 |



Notes:

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are in RED bold where SI No. 294 of 1989 MACs, SI No. 278 of 2007 Parametric Values are exceeded |
| **553** | Values are shaded yellow and in RED bold where S.I. No. 272 Surface Water Reg. Threshold Levels are exceeded |
| - | '-' signifies analysis not carried out on sample or no Threshold Levels are available. |

# Table A18.28. Results of TPH-CWG, MTBE/BTEX and PAH Analysis on Surface Water Samples SW1 and SW4 from Adjacent Stream at Barnageeragh Cove, Skerries on the 15th June, 2018

| CHEMICAL SUBGROUPING | | Petrol Range Organics | | | | | | Polyaromatic Hydrocarbons (PAHS) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parameter | MTBE | Benzene | Toluene | Ethylbenzene | m-/p-Xylene | o-Xylene | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)+ Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(123cd)pyrene | Dibenzo(ah)anthracene | Benzo(ghi)perylene | Coronene | Total 17 EPA PAHs |
| | Units | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l | µg/l |
| DUTCH CRITERIA | Dutch Intervention Levels | - | 30 | 1000 | 150 | 70 | 70 | 70 | - | - | - | 5 | 5 | 1 | - | 0.5 | 0.2 | 0.05 | 0.05 | 0.05 | - | 0.05 | - | - |
| | Dutch Target Level | - | 0.2 | 7 | 4 | 0.2 | 0.2 | 0.01 | - | - | - | 0.003 | 0.0007 | 0.003 | - | 0.0001 | 0.003 | 0.0004 | 0.0005 | 0.0004 | - | 0.0003 | - | - |
| World Health Organisation Standard | Guideline Values | 30 | 10 | 700 | 300 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| S.I. No. 294, European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations, 1989 | MACs | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.2 |
| S.I. No. 278, European Communities Environmental Objectives (Drinking Water) (No. 2) Regulations, 2007 | Parametric Values | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.01 | - | - | - | - | 0.1 |
| S.I. No. 272, European Communities Environmental Objectives (Surface Water) Regulations, 2009) | Threshold Values | - | 50 | - | - | - | - | - | - | - | - | - | - | 0.4 | - | - | - | - | 0.01 | - | - | - | - | - |
| | SURFACE WATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 15.06.18 | SO-SW1-01 | <1 | <1 | <1 | <1 | <1 | <1 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 15.06.18 | SO-SW4-01 | <1 | <1 | <1 | <1 | <1 | <1 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |



Notes:

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are in RED bold where SI No. 294 of 1989 MACs, SI No. 278 of 2007 Parametric Values are exceeded |
| **553** | Values are shaded yellow and in RED bold where S.I. No. 272 Surface Water Reg. Threshold Levels are exceeded |
| - | '-' signifies analysis not carried out on sample or no Threshold Levels are available. |

# Table A18.29. Results of Volatile Organic Compound Laboratory Analysis on Surface Water Samples SW1 and SW4 taken from Adjacent Stream, Barnageeragh Cove, Skerries on the 15th June, 2018

| Parameters | Units | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | WA-SW1-01 | WA-SW4-01 |
|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | mg/l | 0.0005 | - | - | < 0.001 | <0.001 |
| Chloromethane | mg/l | 0.0005 | - | - | <0.001 | <0.001 |
| Vinyl Chloride | mg/l | 0.0005 | 0.00001 | 0.00500 | <0.001 | <0.001 |
| Bromomethane | mg/l | 0.0005 | - | - | <0.005 | <0.005 |
| Chloroethane | mg/l | 0.0005 | - | - | <0.002 | <0.002 |
| Trichlorofluoromethane | mg/l | 0.0005 | - | - | <0.001 | <0.001 |
| trans-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | <0.001 | <0.001 |
| 1,1-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.01000 | <0.001 | <0.001 |
| 1,1-Dichloroethane | mg/l | 0.0005 | 0.00700 | 0.90000 | <0.001 | <0.001 |
| tert-butyl methyl ether | mg/l | 0.0005 | - | 9.20000 | <0.001 | <0.001 |
| cis-1,2-Dichloroethene | mg/l | 0.0005 | 0.00001 | 0.02000 | <0.001 | <0.001 |
| Bromochloromethane | mg/l | 0.1 | - | - | <0.005 | <0.005 |
| 2,2-Dichloropropane | mg/l | 0.1 | 0.00080 | 0.08000 | <0.001 | <0.001 |
| 1,2-Dichloroethane | mg/l | 0.1 | 0.00700 | 0.40000 | <0.002 | <0.002 |
| 1,1,1-Trichloroethane | mg/l | - | 0.00001 | 0.30000 | <0.001 | <0.001 |
| 1,1-Dichloropropene | mg/l | - | - | - | <0.001 | <0.001 |
| Benzene | mg/l | - | 0.00020 | 0.03000 | <0.001 | <0.001 |
| Dibromomethane | mg/l | 0.0002 | - | - | <0.010 | <0.010 |
| Bromodichloromethane | mg/l | 0.0002 | - | - | <0.005 | <0.005 |
| Trichloroethene | mg/l | 0.0002 | 0.02400 | 0.50000 | <0.001 | <0.001 |
| cis-1,3-Dichloropropene | mg/l | 0.0002 | - | - | <0.010 | <0.010 |
| trans-1,3-Dichloropropene | mg/l | 0.0002 | - | - | <0.010 | <0.010 |
| 1,1,2-Trichloroethane | mg/l | 0.0002 | 0.00001 | 0.13000 | <0.010 | <0.010 |
| Toluene | mg/l | 0.0002 | 0.00700 | 1.00000 | <0.001 | <0.001 |
| 1,3-Dichloropropane | mg/l | 0.0002 | - | - | <0.002 | <0.002 |
| Dibromochloromethane | mg/l | 0.0002 | - | - | <0.010 | <0.010 |
| 1,2-Dibromoethane | mg/l | 0.0002 | - | - | <0.005 | <0.005 |
| Tetrachloroethene | mg/l | 0.0002 | 0.0000100 | 0.04000 | <0.001 | <0.001 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0002 | - | - | <0.002 | <0.002 |
| Chlorobenzene | mg/l | 0.0002 | 0.0070000 | 0.18000 | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.0002 | 0.0040000 | 0.15000 | <0.001 | <0.001 |
| p/m-Xylene | mg/l | 0.0002 | 0.00020 | 0.07000 | <0.001 | <0.001 |
| Styrene | mg/l | 0.0002 | - | - | <0.001 | <0.001 |
| o-Xylene | mg/l | - | 0.00020 | 0.07000 | <0.001 | <0.001 |
| 1,2,3-Trichloropropane | mg/l | - | - | - | <0.050 | <0.050 |
| Isopropylbenzene | mg/l | - | - | - | <0.001 | <0.001 |
| Bromobenzene | mg/l | - | - | - | <0.001 | <0.001 |
| 2-Chlorotoluene | mg/l | - | - | - | <0.001 | <0.001 |
| Propylbenzene | mg/l | - | - | - | <0.001 | <0.001 |
| 4-Chlorotoluene | mg/l | - | - | - | <0.001 | <0.001 |
| 1,2,4-Trimethylbenzene | mg/l | - | - | - | <0.001 | <0.001 |
| 4-Isopropyltoluene | mg/l | - | - | - | <0.001 | <0.001 |
| 1,3-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | <0.001 | <0.001 |
| 1,4-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | <0.001 | <0.001 |
| sec-Butylbenzene | mg/l | - | - | - | <0.001 | <0.001 |
| tert-Butylbenzene | mg/l | - | - | - | <0.001 | <0.001 |
| 1,2-Dichlorobenzene | mg/l | - | 0.00300 | 0.05000 | <0.001 | <0.001 |
| n-Butylbenzene | mg/l | - | - | - | <0.001 | <0.001 |
| 1,2-Dibromo-3-chloropropane | mg/l | 0.1 | - | - | <0.050 | <0.050 |
| 1,2,4-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | <0.001 | <0.001 |
| 1,2,3-Trichlorobenzene | mg/l | - | 0.00001 | 0.01000 | <0.002 | <0.002 |
| Hexachlorobutadiene | mg/l | - | - | - | <0.001 | <0.001 |



Notes:

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in RED bold wherever Dutch-IV and/or SI No. 81 of 1988 MACs are exceeded |
| **553** | Values are in bold where a value greater than the MDL was obtained. |
| - | -' signifies analysis not carried out on sample or no Dutch Criteria or EPA Guideline Value is available. |

# Table A18.30. Results of Semi-volatile Organic Compound Laboratory Analysis on Surface Water Samples SW1 and SW4 taken from Adjacent Stream, Barnageeragh Cove, Skerries on the 15th June, 2018

| Parameters | Units | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | WA-SW1-01 | WA-SW4-01 |
|---|---|---|---|---|---|---|
| Phenol | mg/l | 0.0005 | 0.20000 | 2.00000 | <0.0005 | <0.0005 |
| 2-Chlorophenol | mg/l | 0.0005 | 0.00030 | 0.10000 | <0.0005 | <0.0005 |
| 2,4-Dichlorophenol | mg/l | 0.0005 | 0.00020 | 0.03000 | <0.0005 | <0.0005 |
| 2,4-Dimethylphenol | mg/l | 0.0005 | - | - | <0.0005 | <0.0005 |
| 4-Chloro-3-methylphenol | mg/l | 0.0005 | - | - | <0.0005 | <0.0005 |
| 2,4,6-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | <0.0005 | <0.0005 |
| 2,4,5-Trichlorophenol | mg/l | 0.0005 | 0.00001 | 0.01000 | <0.0005 | <0.0005 |
| Pentachlorophenol | mg/l | 0.0005 | 0.00004 | 0.00300 | <0.0005 | <0.0005 |
| 2-Methylphenol | mg/l | 0.0005 | - | - | <0.0005 | <0.0005 |
| 4-Methylphenol | mg/l | 0.0005 | - | - | <0.0005 | <0.0005 |
| 2-Nitrophenol | mg/l | 0.0005 | - | - | <0.0005 | <0.0005 |
| 4-Nitrophenol | mg/l | 0.0005 | - | - | <0.0005 | <0.0005 |
| 1,3-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | <0.0005 | <0.0005 |
| 1,4-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | <0.0005 | <0.0005 |
| 1,2-Dichlorobenzene | mg/l | 0.1 | 0.00300 | 0.05000 | <0.0005 | <0.0005 |
| 1,2,4-Trichlorobenzene | mg/l | 0.1 | 0.00001 | 0.01000 | <0.0005 | <0.0005 |
| Nitrobenzene | mg/l | - | - | - | <0.0005 | <0.0005 |
| Azobenzene | mg/l | - | - | - | <0.0005 | <0.0005 |
| Hexachlorobenzene | mg/l | - | 0.00000009 | 0.00050 | <0.0005 | <0.0005 |
| Acenaphthylene | mg/l | 0.0002 | - | - | <0.0005 | <0.0005 |
| Acenaphthene | mg/l | 0.0002 | - | - | <0.0005 | <0.0005 |
| Fluorene | mg/l | 0.0002 | - | - | <0.0005 | <0.0005 |
| Pyrene | mg/l | 0.0002 | - | - | <0.0005 | <0.0005 |
| Benzo(b,k)fluoranthrene | mg/l | 0.0002 | - | - | <0.0005 | <0.0005 |
| Naphthalene | mg/l | 0.0002 | 0.00001 | 0.07000 | <0.0005 | <0.0005 |
| Anthracene | mg/l | 0.0002 | 0.000007 | 0.00500 | <0.0005 | <0.0005 |
| Phenanthrene | mg/l | 0.0002 | 0.000003 | 0.00500 | <0.0005 | <0.0005 |
| Fluoranthrene | mg/l | 0.0002 | 0.000003 | 0.00100 | <0.0005 | <0.0005 |
| Benzo(a)anthracene | mg/l | 0.0002 | 0.0000001 | 0.00050 | <0.0005 | <0.0005 |
| Chrysene | mg/l | 0.0002 | 0.0000030 | 0.00020 | <0.0005 | <0.0005 |
| Benzo(a)pyrene | mg/l | 0.0002 | 0.0000005 | 0.00005 | <0.0005 | <0.0005 |
| Benzo(ghi)perylene | mg/l | 0.0002 | 0.0000003 | 0.00005 | <0.0005 | <0.0005 |
| Indeno(1,2,3-cd)pyrene | mg/l | 0.0002 | 0.0000004 | 0.00005 | <0.0005 | <0.0005 |
| Dibenzo(a,h)anthracene | mg/l | 0.0002 | - | - | <0.0005 | <0.0005 |
| 2-Chloronaphthalene | mg/l | 0.0002 | - | 0.006 | <0.0005 | <0.0005 |
| 2-Methylnaphthalene | mg/l | 0.0002 | - | - | <0.0005 | <0.0005 |
| Carbazole | mg/l | - | - | - | <0.0005 | <0.0005 |
| Isophorone | mg/l | - | - | - | <0.0005 | <0.0005 |
| Dibenzofuran | mg/l | - | - | - | <0.0005 | <0.0005 |
| Dimethyl phthalate | mg/l | - | - | - | <0.0005 | <0.0005 |
| Diethyl phthalate | mg/l | - | - | - | <0.0005 | <0.0005 |
| Di-n-butylphthalate | mg/l | - | - | - | <0.0005 | <0.0005 |
| Di-n-octylphthalate | mg/l | - | - | - | <0.0005 | <0.0005 |
| Bis(2-ethylhexyl)phthalate | mg/l | - | - | - | <0.0005 | <0.0005 |
| Butylbenzylphthalate | mg/l | - | - | - | <0.0005 | <0.0005 |
| 4-Chloroaniline | mg/l | - | - | 0.030 | <0.0005 | <0.0005 |
| 2-Nitroanaline | mg/l | - | - | - | <0.0005 | <0.0005 |
| 3-Nitroaniline | mg/l | - | - | - | <0.0005 | <0.0005 |
| 4-Nitroaniline | mg/l | - | - | - | <0.0005 | <0.0005 |
| 2,4-Dinitrotoluene | mg/l | - | - | - | <0.0005 | <0.0005 |
| 2,6-Dinitrotoluene | mg/l | - | - | - | <0.0005 | <0.0005 |
| Bis(2-chloroethyl)ether | mg/l | - | - | - | <0.0005 | <0.0005 |
| 4-Bromophenylphenylether | mg/l | - | - | - | <0.0005 | <0.0005 |
| 4-Chlorophenylphenylether | mg/l | 0.1 | - | - | <0.0005 | <0.0005 |
| Hexachloroethane | mg/l | - | - | - | <0.0005 | <0.0005 |
| Hexachlorobutadiene | mg/l | - | - | - | <0.0005 | <0.0005 |
| Hexchlorocyclopentadiene | mg/l | - | - | - | <0.0005 | <0.0005 |
| Bis(2-chloroethoxy)methane | mg/l | - | - | - | <0.0005 | <0.0005 |
| N-nitrosodi-n-propylamine | mg/l | - | - | - | <0.0005 | <0.0005 |



**Notes:**

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in RED bold wherever Dutch-IV, SI No. 81 of 1988 MACs, SI No. 439 of 2000 Parametric Values or EPA Guideline Values are exceeded |
| - | -' signifies analysis not carried out on sample or no Dutch Criteria or EPA Guideline Value is available. |

# Table A18.31. Results of Chlorinated Pesticide and Acid Herbicide Laboratory Analyses on Surface Water Samples taken from SW1 and SW4 at Barnageeragh Cove, Skerries on 15th June, 2018

| Parameters | Units | Guidelines | Standards | | SURFACE WATER | |
|---|---|---|---|---|---|---|
| | | SI 81, 1988 Water Quality (Human Consumption) | Dutch Criteria Level TV | Dutch Criteria Level IV | WA-SW1-01 | WA-SW4-01 |
| Trifluralin | µg/l | 0.1 | - | - | <0.20 | <0.20 |
| Endosulfan I | µg/l | 0.1 | 0.0002 | 0.005 | <0.20 | <0.20 |
| *Aldrin* | µg/l | 0.1 | 0.000009 | - | <0.20 | <0.20 |
| *Dieldrin* | µg/l | 0.1 | 0.00004 | - | <0.20 | <0.20 |
| Endosulfan II | µg/l | 0.1 | - | - | <0.20 | <0.20 |
| Gamma-HCH (Lindane) | µg/l | - | - | - | <0.20 | <0.20 |
| Dichlorprop | µg/l | 0.1 | - | - | <0.010 | <0.010 |
| Mecoprop | µg/l | 0.1 | - | - | <0.40 | <0.40 |
| Atrazine | µg/l | 0.1 | - | - | <0.20 | <0.20 |
| Simazne | µg/l | 0.1 | - | - | <0.20 | <0.20 |



Notes:

As New Dutch Criteria have no chlorinated pesticide standards, old standards are referenced.

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in RED bold wherever Dutch-IV and/or SI No. 81 of 1988 MACs are exceeded |
| - | -' signifies analysis not carried out on sample or no Dutch Criteria is available. |

# Table A18.32. Major Ion Balance on Surface Water Samples SW1 and SW4 taken from Adjacent Stream at Barnageeragh Cove, Skerries on the 15th June, 2018

| | | Cations | | | | Anions | | | Balance | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Elec. Cond. ($\mu Scm^{-1}$) | $Ca^{2+}$ (meq $L^{-1}$) | $Mg^{2+}$ (meq $L^{-1}$) | $Na^{+}$ (meq $L^{-1}$) | $K^{+}$ (meq $L^{-1}$) | $Cl^{-}$ (meq $L^{-1}$) | $SO_4^{2-}$ (meq $L^{-1}$) | $HCO_3^{-}$ (meq $L^{-1}$) | $\Sigma^{+}$ (meq $L^{-1}$) | $\Sigma^{-}$ (meq $L^{-1}$) | % Ion Balance Error | pH |
| WA-SW1-01 | 700 | 5.99 | 1.23 | 0.91 | 0.06 | 1.33 | 0.79 | 6.82 | 8.19 | 8.94 | -4.37 | 8.1 |
| WA-SW4-01 | 690 | 5.99 | 1.15 | 0.74 | 0.05 | 1.21 | 0.62 | 7.06 | 7.93 | 8.90 | -5.76 | 8.2 |

# SOIL (DQRA) RESULTS TABLES

| TABLE NO. | TABLE DESCRIPTION |
|---|---|
| A18.33 | Results of Groundwater DQRA Specialist Soils Laboratory Analysis on Soil Samples taken from Gas Venting Wells GV1-5, Boreholes BH15-17 and Trialpits TP49-50 at Barnageeragh Cove, Skerries, Co. Dublin |

# Table A18.33 Results of Groundwater DQRA Specialist Soils Laboratory Analysis on Soil Samples taken from Gas Venting Wells GV1-5, Boreholes BH15-17 and Trialpits TP49-50 at Barnageeragh Cove, Skerries, Co. Dublin

| Parameter | SOURCE | GAS VENTING WELLS (GV01-05) | | | | | | | | | | GROUNDWATER BOREHOLES (BH15-17) | | | TRIALPITS (TP49-50) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Units | SO-GV1-01 | SO-GV1-02 | SO-GV2-01 | SO-GV2-02 | SO-GV3-01 | SO-GV3-02 | SO-GV4-01 | SO-GV4-02 | SO-GV5-01 | SO-GV5-02 | SO-BH15-01 | SO-BH16-01 | SO-BH17-01 | SO-TP49-01 | SO-TP50-01 |
| Kjeldahl Nitrogen | % | 0.18 | 0.2 | 0.59 | 0.12 | 0.24 | 0.29 | 0.25 | 0.26 | 0.22 | 0.27 | 0.11 | 0.09 | 0.23 | | |
| Kjeldahl Nitrogen | mg/kg dw | | | | | | | | | | | | | | 849 | 411 |
| Nitrate (NO3) | mg/kg $NO_3$- N dw | 75.4 | <2.5 | 3.2 | <2.5 | <2.5 | <2.5 | 2.7 | 33.2 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | 5 | 42 |
| Nitrite (NO2) | mg/kg $NO_2$- N dw | 0.21 | 0.17 | 0.3 | 0.31 | 0.5 | 0.34 | 0.69 | 0.35 | 0.18 | 0.28 | 0.33 | 0.27 | 0.28 | 1.1 | 2.2 |
| Chloride (Cl) | mg/kg dw | 23.2 | 72.2 | 83.3 | 87.7 | 171.8 | 214.5 | 420.4 | 162 | 356.9 | 13.1 | 14.4 | 42.8 | 521.2 | 37 | 84 |
| Sulphate (SO4) | mg/kg dw | <3 | <3 | 13.7 | 343 | 480 | 2257 | 3245 | 4348 | 566 | 4505 | 344 | <3 | 10.4 | 18 | 40.6 |
| Moisture Content | % | | | | | | | | | | | | | | 12.7 | 35.1 |
| Total Organic Matter | % dw | 0.9 | 2.5 | 3.8 | 0.8 | 2.9 | 1.9 | 4.5 | 3.1 | 3.7 | 4.9 | 0.2 | 0.4 | 1.2 | 1.1 | 0.8 |
| Cation Exchange Capacity | mEqv/100g | 8.04 | 9.19 | 11.21 | 7.76 | 9.22 | 9.23 | 8.23 | 7.2 | 10.7 | 7.71 | 6.31 | 10.2 | 9.2 | 9.98 | 14.5 |
| Exchangeable Cations | mg/kg dw | 10.6 | 15.42 | 17.94 | 10.6 | 14.8 | 5.9 | 21.5 | 22.2 | 16.9 | 23.5 | 9.43 | 10.1 | 14.6 | | |
| Exchangeable Cations | mEqv/100g | | | | | | | | | | | | | | 16.5 | 22 |
| Sodium (Na) | mg/kg dw | 80 | <20 | 100 | 35 | 44 | 99 | 217 | 325 | 100 | 310 | 90 | 44 | 11 | 508 | 745 |
| Sodium (Na) | mEqv/100g | 0.35 | <0.1 | 0.44 | 0.15 | 0.19 | 0.43 | 0.94 | 1.4 | 0.44 | 1.35 | 0.39 | 0.19 | 0.05 | | |
| Potassium (K) | mg/kg dw | 0.44 | 0.63 | 0.99 | 0.76 | 0.56 | 1.75 | 1.62 | 1.9 | 1.01 | 1.85 | 0.21 | 0.16 | 0.45 | 155 | 623 |
| Potassium (K) | mEqv/100g | 172 | 245 | 385 | 295 | 219 | 682 | 633 | 741 | 393 | 720 | 83 | 63 | 176 | | |
| Magnesium (Mg) | mg/kg dw | 82 | 283 | 334 | 141 | 220 | 257 | 620 | 712 | 354 | 587 | 103 | 109 | 117 | 219 | 249 |
| Magnesium (Mg) | mEqv/100g | 0.69 | 2.36 | 2.79 | 1.18 | 1.84 | 2.15 | 5.2 | 5.9 | 3 | 4.9 | 0.86 | 0.91 | 0.98 | | |
| Calcium (Ca) | mg/kg dw | 1819 | 2484 | 2745 | 1702 | 2440 | 2314 | 2743 | 2595 | 2495 | 3088 | 1593 | 1759 | 2624 | 2435 | 3027 |
| Calcium (Ca) | mEqv/100g | 9.1 | 12.4 | 13.7 | 8.5 | 12.2 | 1.5 | 13.7 | 12.9 | 12.5 | 15.4 | 7.97 | 88 | 13.1 | | |
| Leached Ammonia | mg/kg dw | | | | | | | | | | | | | | 9.9 | 4.5 |

# TOPSOIL RESULTS TABLES

| TABLE NO | TABLE DESCRIPTION |
|---|---|
| A18.34 | Results of Heavy Metal, Anion, Total Dissolved Solids and Phenol Lab. Analysis on 10:1 Leachate from Topsoil Samples and TOC/LOI Lab. Analysis on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin |
| A18.35 | Results of TPH-GWG, BTEX, Polyaromatic Hydrocarbon, PCB and pH (Total Pollutant) Laboratory Analysis on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin |
| A18.36 | Results of Heavy Metals (i.e. Total Pollutant) Laboratory Analysis on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin |
| A18.37 | Volatile Organic Compounds (VOC) Laboratory Results on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin |
| A18.38 | Semi-Volatile Organic Compounds (sVOC) Laboratory Results on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin |
| A18.39 | Organophosphorus, Organonitrogen and Organochlorine Pesticides Laboratory Results on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin |

# Table A18.34 Results of Heavy Metal, Anion, Total Dissolved Solids and Phenol Lab. Analysis on 10:1 Leachate from Topsoil Samples and TOC/LOI Lab. Analysis on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co.Dublin

| CHEMICAL SUBGROUPING | | | | Antimony Low Level CEN 10:1 Leachate | Arsenic Low Level CEN 10:1 Leachate | Barium Low Level CEN 10:1 Leachate | Cadmium Low Level CEN 10:1 Leachate | Chromium Low Level CEN 10:1 Leachate | Copper Low Level CEN 10:1 Leachate | Lead Low Level CEN 10:1 Leachate | Mercury Low Level CEN 10:1 Leachate | Molybdenum Low Level CEN 10:1 Leachate | Nickel Low Level CEN 10:1 Leachate | Selenium Low Level CEN 10:1 Leachate | Zinc Low Level CEN 10:1 Leachate | Anions | | | TDS | Phenols | Organic/ Carbon Content of Leachate | Organic/Carbon Content of Soil (Total Pollutant) | | EWC Codes | Confirmed Asbestos Free | Soil Waste Classification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | Sulphate CEN 10:1 Leachate | Fluoride in CEN 10:1 Leachate | Chloride in CEN 10:1 Leachate | Total Dissolved Solids | Total Phenols | Dissolved Organic Carbon | Total Organic Carbon (%) | Loss on Ignition | | | |
| Source | Units | WASTE CRITERIA | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | % | % | | | |
| MURPHY ENVIRONMENTAL WASTE LICENCE WA 129-02 | WAC Values | INERT WASTE | | 0.06 | 0.5 | 20 | 0.04 | 0.5 | 2 | 0.5 | 0.01 | 0.5 | 0.4 | 0.1 | 4 | 1000 | 10 | 800 | 4000 | 1 | 500 | 3 | - | | | |
| WASTE FRAMEWORK DIRECTIVE | WAC Values | STABLE NON-REACTIVE | | 0.7 | 2 | 100 | 1 | 10 | 50 | 10 | 0.2 | 10 | 10 | 0.5 | 50 | 20000 | 150 | 15000 | 60000 | 0 | 800 | 5 | - | | | |
| WASTE FRAMEWORK DIRECTIVE | WAC Values | HAZARDOUS WASTE | | 5 | 25 | 300 | 5 | 70 | 100 | 50 | 2 | 30 | 40 | 7 | 200 | 50000 | 500 | 25000 | 100000 | 0 | 1000 | 6 | - | | | |
| SOURCE | SAMPLE ID | DATE OF SAMPLING | SAMPLE DEPTH | | | | | | | | | | | | | | | | | | | | | | | |
| TOPSOIL | SO-TS1-01 | 22/11/2018 | - | < 0.010 | < 0.050 | < 0.50 | < 0.010 | < 0.050 | 0.055 | < 0.010 | < 0.0050 | < 0.050 | < 0.050 | 0.015 | < 0.50 | 280 | 5.0 | 210 | 1900 | < 0.30 | 110 | 1.4 | 4.1 | 17 05 04 | Y | INERT |
| TOPSOIL | SO-TS2-01 | 22/11/2018 | - | < 0.010 | 0.12 | < 0.50 | < 0.010 | < 0.050 | 0.22 | < 0.010 | < 0.0050 | 0.076 | < 0.050 | 0.010 | < 0.50 | 60 | 6.9 | 87 | 1400 | < 0.30 | 100 | 1.0 | 3.6 | 17 05 04 | Y | INERT |

**Notes:**

| | |
|---|---|
| **553** | Values are shaded yellow and in Red bold wherever Murphy Environmental Waste Licence WA129-2 WAC Value is exceeded |
| ~ | '~' signifies laboratory analysis not carried out. |
| - | '-' signifies no Murphy Environmental Waste Licence WAC Value available. |

# Table A18.35 Results of TPH-CWG, BTEX, Polyaromatic Hydrocarbon, PCB and pH (Total Pollutant) Laboratory Analysis on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin

| CHEMICAL SUBGROUPING | | | | Aliphatics | | | | | | | | | Aromatics | | | | | | | | | TPH | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GENERIC ASSESSMENT CRITERIA | Parameter | | | EC C5-C6 | EC>C6-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C40 | Total Aliphatics | EC C5-C7 | EC>C7-C8 | EC>C8-C10 | EC>C10-C12 | EC>C12-C16 | EC>C16-C21 | EC>C21-C35 | EC>C35-C44 | Total Aromatics | Total Petroleum Hydrocarbons | Mineral Oil | TOTAL BTEX |
| | Units | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| DUTCH CRITERIA CRITERIA | Dutch Intervention Levels (IV) | | | - | - | - | - | - | - | - | - | 5000 | - | - | - | - | - | - | - | - | - | - | 5000 | - |
| | Dutch Target Level (TV) | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | - |
| LQM/CIEH GENERIC ASSESSMENT CRITERIA | Residential | | | 110 | 370 | 110 | 540 (283)$^{vap}$ | 3000 (142)$^{sol}$ | 76000 | - | 76000 | - | 280 | 611 | 151 | 346 | 593 | 770 | 1230 | 1230 | - | - | - | - |
| | Allotment | | | 3900 | 13000 | 1700 | 7300 | 13000 | 270000 | - | 270000 | - | 57 | 120 | 51 | 74 | 130 | 260 | 1600 | 1600 | - | | - | - |
| | Commercial | | | 13000 (1150)$^{sol}$ | 42000 (736)$^{sol}$ | 12000 (451)$^{vap}$ | 49000 (283)$^{vap}$ | 91000 (142)$^{sol}$ | 1800000 | - | 1800000 | - | 90000 (4710)$^{sol}$ | 190000 (4360)$^{vap}$ | 18000 (3580)$^{vap}$ | 34500 (2150)$^{sol}$ | 37800 | 28000 | 28000 | 28000 | - | - | - | - |
| CLEA SOIL GUIDELINE VALUES | Calculated SGV | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3.854E+11 |
| | 2009 Published SGV [1] | Residential with plant | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | - |
| | | Allotment | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | - |
| | | Industrial/ Commercial | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Pre 2008 Published SGV [2] | Residential with plant | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | Industrial | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MURPHY ENVIRONMENTAL WASTE LICENCE WA 129-02 | Inert WAC Values | | | - | - | - | - | - | - | - | - | 500 | - | - | - | - | - | - | - | - | - | - | 500 | 6 |
| MURPHY ENVIRONMENTAL GORMANSTOWN WASTE LICENCE WA 151-01 | Clean subsoil' In house WAC Values | | | - | - | - | - | - | - | - | - | 250 | - | - | - | - | - | - | - | - | - | - | 250 | 3 |
| SOURCE | SAMPLE ID | DATE OF SAMPLING | | | | | | | | | | | | | | | | | | | | | | |
| TOPSOIL | SO-TS1-01 | 22/11/2018 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 5.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 5.0 | < 10 | < 10 | < 0.010 |
| TOPSOIL | SO-TS2-01 | 22/11/2018 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 5.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 5.0 | < 10 | < 10 | < 0.010 |

# Table A18.35 Results of TPH-CWG, BTEX, Polyaromatic Hydrocarbon, PCB and pH (Total Pollutant) Laboratory Analysis on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin

| CHEMICAL SUBGROUPING | | | | PAHs | | | | | | | | | | | | | | | | | PCBs | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GENERIC ASSESSMENT CRITERIA | Parameter | | | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(123cd)pyrene | Dibenzo(ah)anthracene | Benzo(ghi)perylene | Total 17 EPA PAHs | PCB Congener 28 | PCB Congener 52 | PCB Congener 101 | PCB Congener 118 | PCB Congener 138 | PCB Congener 153 | PCB Congener 180 | PCB Total of 7 Congeners | pH Soil |
| | Units | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | mg/kg | pH Units |
| DUTCH CRITERIA CRITERIA | Dutch Intervention Levels (IV) | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Dutch Target Level (TV) | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LQM/CIEH GENERIC ASSESSMENT CRITERIA | Residential | | | 8.7 | 850 | 1000 | 780 | 380 | 9200 | 670 | 1600 | 5.9 | 9.3 | 7 | - | 10 | 1 | 4.2 | 0.9 | 47 | - | - | - | - | | - | - | - | - | - |
| | Allotment | | | 23 | 160 | 200 | 160 | 90 | 2200 | 290 | 620 | 10 | 12 | 13 | | 23 | 2.1 | 7.1 | 2.3 | 160 | - | - | - | - | | - | - | - | - | - |
| | Commercial | | | 1100 (432)[sol] | 100000 | 100000 | 71000 | 23000 | 540000 | 23000 | 54000 | 97 | 140 | 100 | - | 140 | 14 | 62 | 13 | 660 | - | - | - | - | - | - | - | - | - | - |
| CLEA SOIL GUIDELINE VALUES | Calculated SGV | | | - | - | - | - | - | - | - | - | - | - | | | - | - | - | - | - | - | - | - | - | | - | - | - | - | |
| | 2009 Published SGV [1] | Residential with plant | | - | - | - | - | - | - | - | - | - | - | | | - | - | - | - | - | - | - | - | - | | - | - | - | - | - |
| | | Allotment | | - | - | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | - | - | - | - | | - | - | - | - | - |
| | | Industrial/ Commercial | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Pre 2008 Published SGV [2] | Residential with plant | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | Industrial | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MURPHY ENVIRONMENTAL WASTE LICENCE WA 129-02 | Inert WAC Values | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100 | - | - | - | - | - | - | - | 1 | - | |
| MURPHY ENVIRONMENTAL GORMANSTOWN WASTE LICENCE WA 151-01 | Clean subsoil' In house WAC Values | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 50 | - | - | - | - | - | - | - | 1 | - | |
| SOURCE | SAMPLE ID | DATE OF SAMPLING | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOPSOIL | SO-TS1-01 | 22/11/2018 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 2.0 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.10 | 8.0 |
| TOPSOIL | SO-TS2-01 | 22/11/2018 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 2.0 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.10 | 8.1 |

# Table A18.36 Results of Heavy Metals (i.e. Total Pollutant) Laboratory Analysis on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin

| CHEMICAL SUBGROUPING | | | Heavy Metals (Total Pollutant) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GENERIC ASSESSMENT CRITERIA | Parameter | | Antimony Low Level | Arsenic Low Level | Barium Low Level | Cadmium Low Level | Total Chromium Low Level | Chromium (III) Low Level | Chromium (IV) Low Level | Copper Low Level | Lead Low Level | Nickel Low Level | Molybdenum Low Level | Mercury Low Level | Selenium Low Level | Zinc Low Level |
| | Units | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| DUTCH CRITERIA CRITERIA | Dutch Intervention Levels (IV) | | 15 | 55 | 625 | 12 | 380 | - | - | 190 | 530 | 210 | 200 | 10 | 100 | 720 |
| | Dutch Target Level (TV) | | 3 | 29 | 160 | 0.8 | 100 | - | - | 36 | 85 | 35 | 3 | 0.3 | 0.7 | 140 |
| LQM/CIEH GENERIC ASSESSMENT CRITERIA | Residential | | - | - | - | 3 | - | 3000 | 4.3 | 2330 | - | - | - | - | - | 3750 |
| | Allotment | | - | - | - | 0.53 | - | 34600 | 2.1 | 524 | - | - | - | - | - | 618 |
| | Commercial | | - | - | - | 348 | - | 30400 | 35 | 71700 | - | - | - | - | - | 665000 |
| CLEA SOIL GUIDELINE VALUES | 2009 Published SGV [1] | Residential with plant | - | 32 | - | 10 | - | - | - | - | - | 130 | - | 1 | 350 | - |
| | | Allotment | - | 43 | - | 1.8 | - | - | - | - | - | 230 | - | 26 [2] | 120 | - |
| | | Industrial/ Commercial | - | 640 | - | 230 | - | - | - | - | - | 1800 | - | 26 [2] | 13000 | - |
| SAMPLE LOCATION | SAMPLE ID | DATE OF SAMPLING | | | | | | | | | | | | | | |
| TOPSOIL | SO-TS1-O1 | 22/11/2018 | < 2.0 | 18 | 110 | 0.72 | 30 | 30 | < 0.50 | 29 | 40 | 37 | < 2.0 | 0.11 | 0.36 | 94 |
| TOPSOIL | SO-TS2-01 | 22/11/2018 | < 2.0 | 10 | 66 | 0.68 | 25 | 25 | < 0.50 | 20 | 21 | 34 | 2.0 | < 0.10 | 0.42 | 50 |



**Notes:**

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in Red **bold** wherever Dutch-IV, LIEH/LQM GAC or CLEA Soil Guideline Value is exceeded |
| ~ | '~' signifies laboratory analysis not carried out. |
| - | '-' signifies no Dutch Criteria, LIEH/LQM GAC, CLEA Soil Guideline Value or Murphy Environmental Waste Licence WAC Value available. |

1. Based on a sandy loam soil as defined in Environment Agency (2009b) and 6% soil organic matter (SOM).
2. For this project, the lowest SGV values are used for mercury which are the 'Elemental Mercury'.

[sol] GAC presented exceeds the solubility saturation limit, which is presented in brackets

[vap] GAC presented exceed the vapour saturation limit, which is presented in brackets

# Table A18.37. Volatile Organic Compound (VOC) Laboratory Results on Topsoil Samples taken from Barnageeragh Cove, Skerries, Co.Dublin

| Volatile Organic Compounds | Dutch Criteria | | SO-TS1-01 | SO-TS2-01 |
|---|---|---|---|---|
| | TV | IV | | |
| **Depth (m BGL)** | | | - | - |
| **Units** | | | mg/kg | mg/kg |
| Dichlorodifluoromethane | - | - | < 1.0 | < 1.0 |
| Chloromethane | - | - | < 1.0 | < 1.0 |
| Vinyl Chloride | 0.01 | 0.1 | < 1.0 | < 1.0 |
| Bromomethane | - | - | < 20 | < 20 |
| Chloroethane | - | - | < 2.0 | < 2.0 |
| Trichlorofluoromethane | - | - | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | 0.1 | 0.3 | < 1.0 | < 1.0 |
| Trans 1,2-Dichloroethene | 0.2 | 1 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | 0.02 | 15 | < 1.0 | < 1.0 |
| cis 1,2-Dichloroethene | 0.02 | 4 | < 1.0 | < 1.0 |
| Bromochloromethane | - | - | < 5.0 | < 5.0 |
| Trichloromethane | - | - | < 1.0 | < 1.0 |
| 1,1,1-Trichloroethane | 0.07 | 15 | < 1.0 | < 1.0 |
| Tetrachloromethane | 0.4 | 1 | < 1.0 | < 1.0 |
| 1,1-Dichloropropene | - | - | < 1.0 | < 1.0 |
| Benzene | 0.01 | 1 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | - | - | < 2.0 | < 2.0 |
| Trichloroethene | - | - | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | - | - | < 1.0 | < 1.0 |
| Dibromomethane | - | - | < 1.0 | < 1.0 |
| Bromodichloromethane | - | - | < 5.0 | < 5.0 |
| cis-1,3-Dichloropropene | - | - | < 10 | < 10 |
| Toluene | 0.01 | 130 | < 1.0 | < 1.0 |
| Trans-1,3-Dichloropropene | - | - | < 10 | < 10 |
| 1,1,2-Trichloroethane | 0.4 | 10 | < 10 | < 10 |
| Tetrachloroethene | 0.003 | 4 | < 1.0 | < 1.0 |
| 1,3-Dichloropropane | - | - | < 2.0 | < 2.0 |
| Dibromochloromethane | - | - | < 10 | < 10 |
| 1,2-Dibromoethane | - | - | < 5.0 | < 5.0 |
| Chlorobenzene | 0.3 | 30 | < 1.0 | < 1.0 |
| 1,1,1,2-Tetrachloroethane | - | - | < 2.0 | < 2.0 |
| Ethylbenzene | 0.03 | 50 | < 1.0 | < 1.0 |
| m & p-Xylene | 0.01 | 25 | < 1.0 | < 1.0 |
| o-Xylene | 0.01 | 25 | < 1.0 | < 1.0 |
| Styrene | 0.3 | 100 | < 1.0 | < 1.0 |
| Tribromomethane | - | - | < 1.0 | < 1.0 |
| Isopropylbenzene | - | - | < 1.0 | < 1.0 |
| Bromobenzene | - | - | < 1.0 | < 1.0 |
| 1,2,3-Trichloropropane | - | - | < 50 | < 50 |
| N-Propylbenzene | - | - | < 1.0 | < 1.0 |
| 2-Chlorotoluene | - | - | < 1.0 | < 1.0 |
| 1,3,5-Trimethylbenzene | - | - | < 1.0 | < 1.0 |
| 4-Chlorotoluene | - | - | < 1.0 | < 1.0 |
| Tert-Butylbenzene | - | - | < 1.0 | < 1.0 |
| 1,2,4-Trimethylbenzene | - | - | < 1.0 | < 1.0 |
| Sec-Butylbenzene | - | - | < 1.0 | < 1.0 |
| 1,3-Dichlorobenzene | - | - | < 1.0 | < 1.0 |
| 4-Isopropyltoluene | - | - | < 1.0 | < 1.0 |
| 1,4-Dichlorobenzene | - | - | < 1.0 | < 1.0 |
| N-Butylbenzene | - | - | < 1.0 | < 1.0 |
| 1,2-Dichlorobenzene | - | - | < 1.0 | < 1.0 |
| 1,2-Dibromo-3-Chloropropane | - | - | < 50 | < 50 |
| 1,2,4-Trichlorobenzene | - | - | < 1.0 | < 1.0 |
| Hexachlorobutadiene | - | - | < 1.0 | < 1.0 |
| 1,2,3-Trichlorobenzene | - | - | < 2.0 | < 2.0 |
| Methyl Tert-Butyl Ether | - | 100 | < 1.0 | < 1.0 |



Notes:

| | |
|---|---|
| 553 | Values are underlined wherever Dutch-TV is exceeded |
| **553** | Values are shaded yellow and in Red **bold** wherever Dutch-IV is exceeded |
| - | '-' signifies no Dutch Criteria values available. |

**Table A18.38. Semi-Volatile Organic Compound (sVOC) Laboratory Results for Topoil Samples taken from Barnageeragh Cove, Skerries, Co. Dublin**

| Semi-Volatile Organic Compounds | Dutch Criteria | | SO-TS1-01 | SO-TS2-01 |
|---|---|---|---|---|
| Depth (m BGL) | | | - | - |
| Units | | | mg/kg | mg/kg |
| **PHENOLS** | | | | |
| 2-Chlorophenol | **0.05** | **40** | < 0.50 | < 0.50 |
| 2-Methylphenol | - | - | < 0.50 | < 0.50 |
| 2-Methyl-4,6-Dinitrophenol | - | - | < 0.50 | < 0.50 |
| 2-Nitrophenol | - | - | < 0.50 | < 0.50 |
| 2,4-Dichlorophenol | - | - | < 0.50 | < 0.50 |
| 2,4-Dimethylphenol | - | - | < 0.50 | < 0.50 |
| 2,4,5-Trichlorophenol | - | - | < 0.50 | < 0.50 |
| 2,4,6-Trichlorophenol | - | - | < 0.50 | < 0.50 |
| 4-Chloro-3-methylphenol | - | - | < 0.50 | < 0.50 |
| 4-Methylphenol | - | - | < 0.50 | < 0.50 |
| 4-Nitrophenol | - | - | < 0.50 | < 0.50 |
| Pentachlorophenol | - | - | < 0.50 | < 0.50 |
| Phenol | - | - | < 0.50 | < 0.50 |
| Nitrobenzene | - | - | < 0.50 | < 0.50 |
| Azobenzene | - | - | < 0.50 | < 0.50 |
| 1,3-Dichlorobenzene | - | - | < 0.50 | < 0.50 |
| 1,4-Dichlorobenzene | - | - | < 0.50 | < 0.50 |
| 1,2-Dichlorobenzene | - | - | < 0.50 | < 0.50 |
| 1,2,4-Trichlorobenzene | - | - | < 0.50 | < 0.50 |
| 2-Chloronaphthalene | - | - | < 0.50 | < 0.50 |
| 2-Methylnaphthalene | - | - | < 0.50 | < 0.50 |
| Naphthalene | - | - | < 0.50 | < 0.50 |
| Acenaphthylene | - | - | < 0.50 | < 0.50 |
| Acenaphthene | - | - | < 0.50 | < 0.50 |
| Fluorene | - | - | < 0.50 | < 0.50 |
| Pyrene | - | - | < 0.50 | < 0.50 |
| Dibenzo(a,h)anthracene | - | - | < 0.50 | < 0.50 |
| Phenanthrene | - | - | < 0.50 | < 0.50 |
| Anthracene | - | - | < 0.50 | < 0.50 |
| Fluoranthene | - | - | < 0.50 | < 0.50 |
| Benzo[a]anthracene | | - | < 0.50 | < 0.50 |
| Chrysene | | - | < 0.50 | < 0.50 |
| Benzo[b]fluoranthene | - | - | < 0.50 | < 0.50 |
| Benzo[k]fluoranthene | - | - | < 0.50 | < 0.50 |
| Benzo[a]pyrene | - | - | < 0.50 | < 0.50 |
| Benzo[g,h,i]perylene | - | - | < 0.50 | < 0.50 |
| Indeno(1,2,3-c,d)Pyrene | - | - | < 0.50 | < 0.50 |
| **TOTAL 17 PAHS** | | | | |
| Dimethyl phthalate | - | - | < 0.50 | < 0.50 |
| Diethyl phthalate | - | - | < 0.50 | < 0.50 |
| Di-n-butylphthalate | - | - | < 0.50 | < 0.50 |
| Di-n-octylphthalate | - | - | < 0.50 | < 0.50 |
| Bis(2-ethylhexyl)phthalate | - | - | < 0.50 | < 0.50 |
| Butylbenzylphthalate | - | - | < 0.50 | < 0.50 |
| ***TOTAL PHTHALATE (sum of 6)*** | ***0.1*** | **60** | < 0.50 | < 0.50 |
| **OTHER SVOCs** | | | | |
| 2-Nitroaniline | - | - | < 0.50 | < 0.50 |
| 2,4-Dinitrotoluene | - | - | < 0.50 | < 0.50 |
| 2,6-Dinitrotoluene | - | - | < 0.50 | < 0.50 |
| 3-Nitroaniline | - | - | < 0.50 | < 0.50 |
| 4-Bromophenylphenylether | - | - | < 0.50 | < 0.50 |
| 4-Chloroaniline | - | - | < 0.50 | < 0.50 |
| 4-Chlorophenylphenylether | - | - | < 0.50 | < 0.50 |
| 4-Nitroaniline | - | - | < 0.50 | < 0.50 |
| Azobenzene | - | - | < 0.50 | < 0.50 |
| Bis(2-chloroethoxy)methane | - | - | < 0.50 | < 0.50 |
| Bis(2-chloroethyl)ether | - | - | < 0.50 | < 0.50 |
| Carbazole | - | - | < 0.50 | < 0.50 |
| Dibenzofuran | - | - | < 0.50 | < 0.50 |
| Hexachlorobenzene | - | - | < 0.50 | < 0.50 |
| Hexachlorobutadiene | - | - | < 0.50 | < 0.50 |
| Hexachlorocyclopentadiene | - | - | < 0.50 | < 0.50 |
| Hexachloroethane | - | - | < 0.50 | < 0.50 |
| Isophorone | - | - | < 0.50 | < 0.50 |
| N-nitrosodi-n-propylamine | - | - | < 0.50 | < 0.50 |
| N-Nitrosodimethylamine | | | < 0.50 | < 0.50 |
| Bis(2-Chloroisopropyl)Ether | | | < 0.50 | < 0.50 |

**Table A18.39. Organophosphorus, Organonitrogen and Organochlorine Pesticides Laboratory Results for Topsoil Samples taken from Barnageeragh Cove, Skerries, Co.Dublin**

| Pesticides | Dutch Criteria TV | Dutch Criteria IV | SO-TS1-01 | SO-TS2-01 |
|---|---|---|---|---|
| **Depth** | | | - | - |
| **Units** | | | mg/kg | mg/kg |
| **Organophosphorus Pesticides** | | | | |
| Demeton-O | - | - | <0.20 | <0.20 |
| Phorate | - | - | <0.20 | <0.20 |
| Demeton-S | - | - | <0.20 | <0.20 |
| Disulfoton | - | - | <0.20 | <0.20 |
| Fenthion | - | - | <0.20 | <0.20 |
| Trichloronate | - | - | <0.20 | <0.20 |
| Prothiofos | - | - | <0.20 | <0.20 |
| Fensulphothion | - | - | <0.20 | <0.20 |
| Sulprofos | - | - | <0.20 | <0.20 |
| Azinphos-Methyl | - | - | <0.20 | <0.20 |
| Coumaphos | - | - | <0.20 | <0.20 |
| **Organonitrogen Pesticides** | | | | |
| Atraton | - | - | <0.20 | <0.20 |
| Prometon | - | - | <0.20 | <0.20 |
| Simazine | - | - | <0.20 | <0.20 |
| Atrazine | - | - | <0.20 | <0.20 |
| Propazine | - | - | <0.20 | <0.20 |
| Terbuthylazine | - | - | <0.20 | <0.20 |
| Secbumeton | - | - | <0.20 | <0.20 |
| Simetryn | - | - | <0.20 | <0.20 |
| Ametryn | - | - | <0.20 | <0.20 |
| Prometryn | - | - | <0.20 | <0.20 |
| Terbutryn | - | - | <0.20 | <0.20 |
| **Organochloride Pesticides** | | | | |
| Alpha-HCH | - | - | <0.20 | <0.20 |
| Gamma-HCH (Lindane) | - | - | <0.20 | <0.20 |
| Beta-HCH | - | - | <0.20 | <0.20 |
| Delta-HCH | - | - | <0.20 | <0.20 |
| Heptachlor | - | - | <0.20 | <0.20 |
| Aldrin | - | - | <0.20 | <0.20 |
| Heptachlor Epoxide | - | - | <0.20 | <0.20 |
| Gamma-Chlordane | - | - | <0.20 | <0.20 |
| Alpha-Chlordane | - | - | <0.20 | <0.20 |
| Endosulfan I | - | - | <0.20 | <0.20 |
| 4,4-DDE | - | - | <0.20 | <0.20 |
| Dieldrin | - | - | <0.20 | <0.20 |
| Endrin | - | - | <0.20 | <0.20 |
| 4,4-DDD | - | - | <0.20 | <0.20 |
| Endosulfan II | - | - | <0.20 | <0.20 |
| Endrin Aldehyde | - | - | <0.20 | <0.20 |
| 4,4-DDT | - | - | <0.20 | <0.20 |
| Endosulfan Sulphate | - | - | <0.20 | <0.20 |
| Methoxychlor | - | - | <0.20 | <0.20 |
| Endrin Ketone | - | - | <0.20 | <0.20 |

# APPENDIX 19

RAW VALIDATED LABORATORY DATA FROM CHEMTEST LTD.

RAW VALIDATED LABORATORY DATA FROM SOUTHERN SCIENTIFIC LTD.

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

# Final Report

| | |
|---|---|
| **Report No.:** | 17-21490-1 |
| **Initial Date of Issue:** | 23-Aug-2017 |
| **Client** | MULROY ENVIRONMENTAL |
| **Client Address:** | 30 Lisroland View<br>Knockbridge<br>Dundalk<br>County Louth<br>Ireland |
| **Contact(s):** | Padriac Mulroy<br>Patrick McCabe |
| **Project** | Skerries |

| | | | |
|---|---|---|---|
| **Quotation No.:** | Q17-09135 | **Date Received:** | 16-Aug-2017 |
| **Order No.:** | | **Date Instructed:** | 16-Aug-2017 |
| **No. of Samples:** | 1 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 22-Aug-2017 |
| **Date Approved:** | 23-Aug-2017 | | |

**Approved By:**

**Details:** Robert Monk, Technical Development Chemist

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries**

| **Client: MULROY ENVIRONMENTAL** | | | **Chemtest Job No.:** | | 17-21490 |
|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | **Chemtest Sample ID.:** | | 498043 |
| | | | Client Sample ID.: | | SO-TP48-01 |
| | | | Sample Type: | | SOIL |
| | | | Date Sampled: | | 11-Aug-2017 |
| | | | Asbestos Lab: | | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| ACM Type | U | 2192 | | N/A | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 17 |
| Dry Matter | N | | % | N/A | 83 |
| Sulphate (Total) | U | 2430 | mg/kg | 100 | 2200 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 28 |
| Barium | U | 2450 | mg/kg | 10 | 100 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 0.98 |
| Chromium | U | 2450 | mg/kg | 1.0 | 43 |
| Copper | U | 2450 | mg/kg | 0.50 | 28 |
| Mercury | U | 2450 | mg/kg | 0.10 | < 0.10 |
| Molybdenum | U | 2450 | mg/kg | 2.0 | 3.1 |
| Nickel | U | 2450 | mg/kg | 0.50 | 47 |
| Lead | U | 2450 | mg/kg | 0.50 | 23 |
| Antimony | N | 2450 | mg/kg | 2.0 | < 2.0 |
| Selenium | U | 2450 | mg/kg | 0.20 | 1.4 |
| Zinc | U | 2450 | mg/kg | 0.50 | 74 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 5.0 | 43 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 |
| Total Organic Carbon | U | 2625 | % | 0.20 | 0.73 |
| Mineral Oil | N | 2670 | mg/kg | 10 | < 10 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries**

| **Client: MULROY ENVIRONMENTAL** | | | **Chemtest Job No.:** | | 17-21490 |
|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | **Chemtest Sample ID.:** | | 498043 |
| | | | Client Sample ID.: | | SO-TP48-01 |
| | | | Sample Type: | | SOIL |
| | | | Date Sampled: | | 11-Aug-2017 |
| | | | Asbestos Lab: | | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | < 10 |
| Benzene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| Toluene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Coronene | N | 2800 | mg/kg | 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 |

# Results - Single Stage WAC

**Project: Skerries**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-21490 | | | | | | |
| **Chemtest Sample ID:** | 498043 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP48-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 11-Aug-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 0.73 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.4 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.8 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.059 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0032 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.021 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0013 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.032 | 0.32 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0016 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0023 | 0.023 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0017 | 0.017 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0069 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 5.4 | 54 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.21 | 2.1 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 18 | 180 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 110 | 1100 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 13 | 130 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 17 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1450 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2015 | Acid Neutralisation Capacity | Acid Reserve | Titration |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2610 | Loss on Ignition | loss on ignition (LOI) | Determination of the proportion by mass that is lost from a soil by ignition at 550°C. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |

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# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2815 | Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS | ICES7 PCB congeners | Acetone/Hexane extraction / GC-MS |

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# Report Information

## Key

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1



## Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample

## Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

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# Amended Report

| | | | |
|---|---|---|---|
| **Report No.:** | 17-14011-2 | | |
| **Initial Date of Issue:** | 15-Jun-2017 | **Date of Re-Issue:** | 30-Jun-2017 |
| **Client** | MULROY ENVIRONMENTAL | | |
| **Client Address:** | 30 Lisroland View<br>Knockbridge<br>Dundalk<br>County Louth<br>Ireland | | |
| **Contact(s):** | Padriac Mulroy | | |
| **Project** | Skerries Edgeworthstown | | |
| **Quotation No.:** | Q17-09135 | **Date Received:** | 05-Jun-2017 |
| **Order No.:** | | **Date Instructed:** | 05-Jun-2017 |
| **No. of Samples:** | 36 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 09-Jun-2017 |
| **Date Approved:** | 15-Jun-2017 | | |

**Approved By:**

**Details:** Martin Dyer, Laboratory Manager

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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | | | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | | | 462827 | 462828 | 462829 | 462830 | 462831 | 462832 | 462833 | 462834 |
| | | Client Sample ID.: | | | SO-TP6-01 | SO-TP12-01 | SO-TP12-02 | SO-TP7-01 | SO-TP13-01 | SO-TP14-01 | SO-TP14-02 | SO-TP15-01 |
| | | Sample Type: | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | | | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | |
| ACM Type | U | 2192 | | N/A | - | - | - | - | - | - | - | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 16 | 13 | 13 | 15 | 13 | 13 | 20 | 20 |
| Dry Matter | N | | % | N/A | 84 | 87 | 87 | 85 | 87 | 87 | 80 | 80 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 31 | 24 | 33 | 30 | 23 | 19 | 25 | 22 |
| Barium | U | 2450 | mg/kg | 10 | 430 | 130 | 410 | 470 | 230 | 160 | 310 | 240 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 5.3 | 0.39 | 2.7 | 2.0 | 0.70 | 0.36 | 0.72 | 0.54 |
| Chromium | U | 2450 | mg/kg | 1.0 | 49 | 36 | 51 | 39 | 37 | 36 | 40 | 41 |
| Copper | U | 2450 | mg/kg | 0.50 | 630 | 44 | 200 | 200 | 110 | 52 | 120 | 75 |
| Mercury | U | 2450 | mg/kg | 0.10 | 0.41 | 0.17 | 0.24 | 0.42 | 0.28 | 0.19 | 0.32 | 0.25 |
| Molybdenum | U | 2450 | mg/kg | 2.0 | 7.7 | 2.3 | 6.5 | 4.9 | 3.2 | 2.1 | 3.5 | 3.4 |
| Nickel | U | 2450 | mg/kg | 0.50 | 120 | 50 | 85 | 57 | 51 | 41 | 50 | 49 |
| Lead | U | 2450 | mg/kg | 0.50 | 380 | 40 | 390 | 310 | 140 | 81 | 260 | 170 |
| Antimony | N | 2450 | mg/kg | 2.0 | 9.8 | 3.2 | 9.7 | 13 | 4.5 | 39 | 20 | 4.1 |
| Selenium | U | 2450 | mg/kg | 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Zinc | U | 2450 | mg/kg | 0.50 | 730 | 97 | 770 | 560 | 340 | 200 | 320 | 210 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 5.0 | 49 | 36 | 51 | 39 | 37 | 36 | 40 | 41 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Total Organic Carbon | U | 2625 | % | 0.20 | 4.2 | 1.2 | 4.2 | 5.1 | 3.7 | 1.9 | 5.3 | 5.5 |
| Mineral Oil | N | 2670 | mg/kg | 10 | < 10 | < 10 | < 10 | 510 | 360 | < 10 | 1100 | 600 |
| TPH >C6-C10 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH >C10-C21 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 100 | 120 | < 1.0 | 210 | 200 |
| TPH >C21-C40 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 530 | 650 | < 1.0 | 1200 | 860 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | < 10 | < 10 | < 10 | 630 | 770 | < 10 | 1400 | 1100 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 7.2 | 3.5 | < 1.0 | 8.9 | 2.9 |
| Aliphatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 17 | 20 | < 1.0 | 47 | 37 |
| Aliphatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 72 | 60 | < 1.0 | 110 | 92 |
| Aliphatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 410 | 270 | < 1.0 | 810 | 430 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 1.4 | 10 | < 1.0 | 120 | 38 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 | < 5.0 | 510 | 360 | < 5.0 | 1100 | 600 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 1.5 | 1.3 | < 1.0 | 16 | 6.7 |
| Aromatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 2.7 | 40 | < 1.0 | 33 | 59 |

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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | | | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | | | 462827 | 462828 | 462829 | 462830 | 462831 | 462832 | 462833 | 462834 |
| | | Client Sample ID.: | | | SO-TP6-01 | SO-TP12-01 | SO-TP12-02 | SO-TP7-01 | SO-TP13-01 | SO-TP14-01 | SO-TP14-02 | SO-TP15-01 |
| | | Sample Type: | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | | | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | |
| Aromatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 120 | 370 | < 1.0 | 220 | 380 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 4.3 | 8.3 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 | < 5.0 | 120 | 410 | < 5.0 | 280 | 460 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | < 10 | < 10 | < 10 | 630 | 770 | < 10 | 1400 | 1100 |
| Dichlorodifluoromethane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Chloromethane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Vinyl Chloride | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Bromomethane | U | 2760 | µg/kg | 20 | | | | < 20 | | | < 20 | |
| Chloroethane | U | 2760 | µg/kg | 2.0 | | | | < 2.0 | | | < 2.0 | |
| Trichlorofluoromethane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,1-Dichloroethene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Trans 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,1-Dichloroethane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| cis 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Bromochloromethane | U | 2760 | µg/kg | 5.0 | | | | < 5.0 | | | < 5.0 | |
| Trichloromethane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,1,1-Trichloroethane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Tetrachloromethane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,1-Dichloropropene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Benzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | U | 2760 | µg/kg | 2.0 | | | | < 2.0 | | | < 2.0 | |
| Trichloroethene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,2-Dichloropropane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Dibromomethane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Bromodichloromethane | U | 2760 | µg/kg | 5.0 | | | | < 5.0 | | | < 5.0 | |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | | | | < 10 | | | < 10 | |
| Toluene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | | | | < 10 | | | < 10 | |
| 1,1,2-Trichloroethane | U | 2760 | µg/kg | 10 | | | | < 10 | | | < 10 | |
| Tetrachloroethene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,3-Dichloropropane | U | 2760 | µg/kg | 2.0 | | | | < 2.0 | | | < 2.0 | |
| Dibromochloromethane | U | 2760 | µg/kg | 10 | | | | < 10 | | | < 10 | |
| 1,2-Dibromoethane | U | 2760 | µg/kg | 5.0 | | | | < 5.0 | | | < 5.0 | |
| Chlorobenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,1,1,2-Tetrachloroethane | U | 2760 | µg/kg | 2.0 | | | | < 2.0 | | | < 2.0 | |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Tribromomethane | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | 462827 | 462828 | 462829 | 462830 | 462831 | 462832 | 462833 | 462834 |
| | | Client Sample ID.: | SO-TP6-01 | SO-TP12-01 | SO-TP12-02 | SO-TP7-01 | SO-TP13-01 | SO-TP14-01 | SO-TP14-02 | SO-TP15-01 |
| | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 |
| | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | |
| Isopropylbenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Bromobenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | | | | < 50 | | | < 50 | |
| N-Propylbenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 2-Chlorotoluene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,3,5-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 4-Chlorotoluene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Tert-Butylbenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,2,4-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Sec-Butylbenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,3-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 4-Isopropyltoluene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,4-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| N-Butylbenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,2-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,2-Dibromo-3-Chloropropane | U | 2760 | µg/kg | 50 | | | | < 50 | | | < 50 | |
| 1,2,4-Trichlorobenzene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| Hexachlorobutadiene | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| 1,2,3-Trichlorobenzene | U | 2760 | µg/kg | 2.0 | | | | < 2.0 | | | < 2.0 | |
| Methyl Tert-Butyl Ether | U | 2760 | µg/kg | 1.0 | | | | < 1.0 | | | < 1.0 | |
| N-Nitrosodimethylamine | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Phenol | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2-Chlorophenol | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Bis-(2-Chloroethyl)Ether | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 1,3-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 1,2-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2-Methylphenol | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Bis(2-Chloroisopropyl)Ether | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| N-Nitrosodi-n-propylamine | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 4-Methylphenol | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Nitrobenzene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Isophorone | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Bis(2-Chloroethoxy)Methane | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2,4-Dichlorophenol | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 1,2,4-Trichlorobenzene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Naphthalene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | 462827 | 462828 | 462829 | 462830 | 462831 | 462832 | 462833 | 462834 |
| | | Client Sample ID.: | SO-TP6-01 | SO-TP12-01 | SO-TP12-02 | SO-TP7-01 | SO-TP13-01 | SO-TP14-01 | SO-TP14-02 | SO-TP15-01 |
| | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 |
| | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Hexachlorobutadiene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 4-Chloro-3-Methylphenol | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2-Methylnaphthalene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2,4,6-Trichlorophenol | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2,4,5-Trichlorophenol | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2-Chloronaphthalene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2-Nitroaniline | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Acenaphthylene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Dimethylphthalate | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2,6-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Acenaphthene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Dibenzofuran | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 4-Chlorophenylphenylether | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2,4-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Fluorene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Diethyl Phthalate | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 4-Nitroaniline | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Azobenzene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| 4-Bromophenylphenyl Ether | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Hexachlorobenzene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Phenanthrene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Anthracene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Carbazole | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Di-N-Butyl Phthalate | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Fluoranthene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Pyrene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Butylbenzyl Phthalate | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Benzo[a]anthracene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Chrysene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Di-N-Octyl Phthalate | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Benzo[b]fluoranthene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Benzo[k]fluoranthene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Benzo[a]pyrene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | 462827 | 462828 | 462829 | 462830 | 462831 | 462832 | 462833 | 462834 |
| | | Client Sample ID.: | SO-TP6-01 | SO-TP12-01 | SO-TP12-02 | SO-TP7-01 | SO-TP13-01 | SO-TP14-01 | SO-TP14-02 | SO-TP15-01 |
| | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 |
| | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | |
| Indeno(1,2,3-c,d)Pyrene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Dibenz(a,h)Anthracene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Benzo[g,h,i]perylene | U | 2790 | mg/kg | 0.50 | | | | < 0.50 | | | < 0.50 | |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.15 | 0.11 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.32 | 0.85 | 0.86 |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 1.0 | 0.10 | 0.23 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.90 | 0.89 | 2.5 |
| Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.69 | 2.2 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.79 |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.56 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.78 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.32 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.76 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.50 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.49 |
| Coronene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | 2.2 | 2.7 | 10 |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | | Chemtest Sample ID.: | 462835 | 462836 | 462837 | 462838 | 462839 | 462840 | 462841 | 462842 | 462843 |
| | | | | Client Sample ID.: | SO-TP15-02 | SO-TP16-01 | SO-TP17-01 | SO-TP8-01 | SO-SP1-01 | SO-TP22-01 | SO-TP21-01 | SO-TP20-01 | SO-TP20-02 |
| | | | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | Date Sampled: | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 |
| | | | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| ACM Type | U | 2192 | | N/A | - | - | - | - | - | - | - | - | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 19 | 18 | 13 | 16 | 8.0 | 18 | 18 | 9.9 | 12 |
| Dry Matter | N | | % | N/A | 81 | 82 | 87 | 84 | 92 | 82 | 82 | 90 | 88 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 15 | 23 | 18 | 23 | 36 | 25 | 29 | 45 | 22 |
| Barium | U | 2450 | mg/kg | 10 | 110 | 260 | 150 | 510 | 480 | 360 | 260 | 250 | 160 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 0.28 | 0.91 | 1.7 | 1.1 | 1.8 | 0.89 | 0.60 | 2.5 | 0.72 |
| Chromium | U | 2450 | mg/kg | 1.0 | 34 | 40 | 35 | 57 | 48 | 38 | 37 | 42 | 48 |
| Copper | U | 2450 | mg/kg | 0.50 | 34 | 65 | 60 | 100 | 430 | 90 | 160 | 110 | 51 |
| Mercury | U | 2450 | mg/kg | 0.10 | 0.12 | 0.42 | 0.15 | 0.76 | 0.22 | 0.34 | 0.20 | 0.12 | < 0.10 |
| Molybdenum | U | 2450 | mg/kg | 2.0 | < 2.0 | 3.0 | 2.2 | 3.1 | 4.9 | 3.3 | 3.2 | 4.3 | 2.3 |
| Nickel | U | 2450 | mg/kg | 0.50 | 42 | 53 | 45 | 59 | 71 | 53 | 51 | 68 | 57 |
| Lead | U | 2450 | mg/kg | 0.50 | 46 | 150 | 100 | 260 | 520 | 1100 | 230 | 230 | 60 |
| Antimony | N | 2450 | mg/kg | 2.0 | 3.4 | 14 | 2.5 | 6.2 | 6.9 | 4.2 | 3.5 | 12 | 2.4 |
| Selenium | U | 2450 | mg/kg | 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Zinc | U | 2450 | mg/kg | 0.50 | 110 | 420 | 260 | 540 | 560 | 300 | 260 | 3600 | 220 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 5.0 | 34 | 40 | 35 | 57 | 48 | 38 | 37 | 42 | 48 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Total Organic Carbon | U | 2625 | % | 0.20 | 2.6 | 2.8 | 1.8 | 4.2 | 2.0 | 4.3 | 4.3 | 1.6 | 1.8 |
| Mineral Oil | N | 2670 | mg/kg | 10 | < 10 | < 10 | 92 | 1200 | < 10 | 220 | 370 | < 10 | < 10 |
| TPH >C6-C10 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH >C10-C21 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | 5.5 | 480 | < 1.0 | 51 | 190 | < 1.0 | < 1.0 |
| TPH >C21-C40 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | 260 | 2300 | < 1.0 | 300 | 320 | < 1.0 | < 1.0 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | < 10 | < 10 | 260 | 2800 | < 10 | 350 | 510 | < 10 | < 10 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 7.5 | < 1.0 | < 1.0 | 5.2 | < 1.0 | < 1.0 |
| Aliphatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 57 | < 1.0 | 4.3 | 58 | < 1.0 | < 1.0 |
| Aliphatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | 4.3 | 170 | < 1.0 | 39 | 110 | < 1.0 | < 1.0 |
| Aliphatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | 88 | 810 | < 1.0 | 180 | 200 | < 1.0 | < 1.0 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 190 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 | 92 | 1200 | < 5.0 | 220 | 370 | < 5.0 | < 5.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 2.1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 35 | < 1.0 | < 1.0 | 5.1 | < 1.0 | < 1.0 |
| Aromatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | 1.2 | 210 | < 1.0 | 8.0 | 14 | < 1.0 | < 1.0 |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | | | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | | | 462835 | 462836 | 462837 | 462838 | 462839 | 462840 | 462841 | 462842 | 462843 |
| | | Client Sample ID.: | | | SO-TP15-02 | SO-TP16-01 | SO-TP17-01 | SO-TP8-01 | SO-SP1-01 | SO-TP22-01 | SO-TP21-01 | SO-TP20-01 | SO-TP20-02 |
| | | Sample Type: | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | | | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| Aromatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | 170 | 1200 | < 1.0 | 120 | 120 | < 1.0 | < 1.0 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 110 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 | 170 | 1600 | < 5.0 | 130 | 140 | < 5.0 | < 5.0 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | < 10 | < 10 | 260 | 2800 | < 10 | 350 | 510 | < 10 | < 10 |
| Dichlorodifluoromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Chloromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Vinyl Chloride | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | 2.1 | | |
| Bromomethane | U | 2760 | µg/kg | 20 | < 20 | | | < 20 | | | < 20 | | |
| Chloroethane | U | 2760 | µg/kg | 2.0 | < 2.0 | | | < 2.0 | | | < 2.0 | | |
| Trichlorofluoromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,1-Dichloroethene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Trans 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,1-Dichloroethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| cis 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | 11 | | |
| Bromochloromethane | U | 2760 | µg/kg | 5.0 | < 5.0 | | | < 5.0 | | | < 5.0 | | |
| Trichloromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,1,1-Trichloroethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Tetrachloromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,1-Dichloropropene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Benzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | U | 2760 | µg/kg | 2.0 | < 2.0 | | | < 2.0 | | | < 2.0 | | |
| Trichloroethene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,2-Dichloropropane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Dibromomethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Bromodichloromethane | U | 2760 | µg/kg | 5.0 | < 5.0 | | | < 5.0 | | | < 5.0 | | |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | < 10 | | | < 10 | | | < 10 | | |
| Toluene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | < 10 | | | < 10 | | | < 10 | | |
| 1,1,2-Trichloroethane | U | 2760 | µg/kg | 10 | < 10 | | | < 10 | | | < 10 | | |
| Tetrachloroethene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,3-Dichloropropane | U | 2760 | µg/kg | 2.0 | < 2.0 | | | < 2.0 | | | < 2.0 | | |
| Dibromochloromethane | U | 2760 | µg/kg | 10 | < 10 | | | < 10 | | | < 10 | | |
| 1,2-Dibromoethane | U | 2760 | µg/kg | 5.0 | < 5.0 | | | < 5.0 | | | < 5.0 | | |
| Chlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,1,1,2-Tetrachloroethane | U | 2760 | µg/kg | 2.0 | < 2.0 | | | < 2.0 | | | < 2.0 | | |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Tribromomethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | | | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | | | 462835 | 462836 | 462837 | 462838 | 462839 | 462840 | 462841 | 462842 | 462843 |
| | | Client Sample ID.: | | | SO-TP15-02 | SO-TP16-01 | SO-TP17-01 | SO-TP8-01 | SO-SP1-01 | SO-TP22-01 | SO-TP21-01 | SO-TP20-01 | SO-TP20-02 |
| | | Sample Type: | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | | | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| Isopropylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Bromobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | < 50 | | | < 50 | | | < 50 | | |
| N-Propylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 2-Chlorotoluene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,3,5-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 4-Chlorotoluene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Tert-Butylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,2,4-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Sec-Butylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,3-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 4-Isopropyltoluene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,4-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| N-Butylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,2-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,2-Dibromo-3-Chloropropane | U | 2760 | µg/kg | 50 | < 50 | | | < 50 | | | < 50 | | |
| 1,2,4-Trichlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| Hexachlorobutadiene | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| 1,2,3-Trichlorobenzene | U | 2760 | µg/kg | 2.0 | < 2.0 | | | < 2.0 | | | < 2.0 | | |
| Methyl Tert-Butyl Ether | U | 2760 | µg/kg | 1.0 | < 1.0 | | | < 1.0 | | | < 1.0 | | |
| N-Nitrosodimethylamine | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Phenol | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2-Chlorophenol | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Bis-(2-Chloroethyl)Ether | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 1,3-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 1,2-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2-Methylphenol | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Bis(2-Chloroisopropyl)Ether | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| N-Nitrosodi-n-propylamine | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 4-Methylphenol | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Nitrobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Isophorone | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Bis(2-Chloroethoxy)Methane | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2,4-Dichlorophenol | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 1,2,4-Trichlorobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Naphthalene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | 462835 | 462836 | 462837 | 462838 | 462839 | 462840 | 462841 | 462842 | 462843 |
| | | Client Sample ID.: | SO-TP15-02 | SO-TP16-01 | SO-TP17-01 | SO-TP8-01 | SO-SP1-01 | SO-TP22-01 | SO-TP21-01 | SO-TP20-01 | SO-TP20-02 |
| | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 |
| | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Hexachlorobutadiene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 4-Chloro-3-Methylphenol | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2-Methylnaphthalene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2,4,6-Trichlorophenol | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2,4,5-Trichlorophenol | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2-Chloronaphthalene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2-Nitroaniline | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Acenaphthylene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Dimethylphthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2,6-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Acenaphthene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Dibenzofuran | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 4-Chlorophenylphenylether | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2,4-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Fluorene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Diethyl Phthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 4-Nitroaniline | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Azobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| 4-Bromophenylphenyl Ether | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Hexachlorobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Phenanthrene | U | 2790 | mg/kg | 0.50 | 0.79 | | | 2.4 | | | < 0.50 | | |
| Anthracene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | 0.92 | | | < 0.50 | | |
| Carbazole | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Di-N-Butyl Phthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Fluoranthene | U | 2790 | mg/kg | 0.50 | 1.2 | | | 7.5 | | | 0.53 | | |
| Pyrene | U | 2790 | mg/kg | 0.50 | 1.1 | | | 6.2 | | | 0.53 | | |
| Butylbenzyl Phthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Benzo[a]anthracene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | 3.7 | | | < 0.50 | | |
| Chrysene | U | 2790 | mg/kg | 0.50 | 0.50 | | | 3.6 | | | < 0.50 | | |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Di-N-Octyl Phthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | | | < 0.50 | | | < 0.50 | | |
| Benzo[b]fluoranthene | U | 2790 | mg/kg | 0.50 | 0.86 | | | 5.3 | | | 0.55 | | |
| Benzo[k]fluoranthene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | 2.4 | | | < 0.50 | | |
| Benzo[a]pyrene | U | 2790 | mg/kg | 0.50 | 0.57 | | | 3.6 | | | < 0.50 | | |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | 462835 | 462836 | 462837 | 462838 | 462839 | 462840 | 462841 | 462842 | 462843 |
| | | Client Sample ID.: | SO-TP15-02 | SO-TP16-01 | SO-TP17-01 | SO-TP8-01 | SO-SP1-01 | SO-TP22-01 | SO-TP21-01 | SO-TP20-01 | SO-TP20-02 |
| | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 31-May-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 |
| | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| Indeno(1,2,3-c,d)Pyrene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | 2.1 | | | < 0.50 | | |
| Dibenz(a,h)Anthracene | U | 2790 | mg/kg | 0.50 | < 0.50 | | | 0.62 | | | < 0.50 | | |
| Benzo[g,h,i]perylene | U | 2790 | mg/kg | 0.50 | 0.52 | | | 2.2 | | | < 0.50 | | |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.16 | 0.32 | < 0.10 | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | 0.13 | 0.32 | 0.47 | 2.3 | < 0.10 | 0.60 | 0.30 | 0.16 | < 0.10 |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | 0.11 | < 0.10 | 0.57 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | 0.30 | 0.73 | 0.79 | 6.5 | 0.12 | 1.1 | 0.95 | 0.27 | < 0.10 |
| Pyrene | U | 2800 | mg/kg | 0.10 | 0.31 | 0.47 | 0.80 | 5.3 | < 0.10 | 0.88 | 0.92 | 0.29 | < 0.10 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 3.4 | < 0.10 | < 0.10 | 0.29 | < 0.10 | < 0.10 |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 3.0 | < 0.10 | < 0.10 | 0.25 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 5.4 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 1.9 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 4.1 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 2.5 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.47 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | 2.2 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Coronene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 | 2.2 | 38 | < 2.0 | 2.7 | 2.7 | < 2.0 | < 2.0 |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | | Chemtest Sample ID.: | 462844 | 462845 | 462846 | 462847 | 462848 | 462849 | 462850 | 462851 | 462852 |
| | | | | Client Sample ID.: | SO-TP19-01 | SO-TP19-02 | SO-TP9-01 | SO-TP10-01 | SO-TP11-01 | SO-TP5-01 | SO-TP4-01 | SO-TP3-01 | SO-TP1-01 |
| | | | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | Date Sampled: | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 02-Jun-2017 |
| | | | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| ACM Type | U | 2192 | | N/A | - | - | - | - | - | - | - | - | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 14 | 14 | 8.5 | 25 | 23 | 14 | 25 | 13 | 8.9 |
| Dry Matter | N | | % | N/A | 86 | 86 | 92 | 75 | 77 | 86 | 75 | 87 | 91 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 27 | 32 | 24 | 61 | 46 | 24 | 59 | 35 | 19 |
| Barium | U | 2450 | mg/kg | 10 | 320 | 290 | 300 | 300 | 360 | 410 | 490 | 770 | 250 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 2.3 | 2.6 | 2.9 | 2.6 | 3.9 | 2.7 | 1.2 | 1.6 | 0.49 |
| Chromium | U | 2450 | mg/kg | 1.0 | 44 | 58 | 48 | 68 | 71 | 56 | 53 | 64 | 36 |
| Copper | U | 2450 | mg/kg | 0.50 | 120 | 170 | 80 | 390 | 560 | 810 | 260 | 270 | 67 |
| Mercury | U | 2450 | mg/kg | 0.10 | 0.13 | 0.11 | 0.73 | 0.48 | 0.36 | 0.16 | 0.80 | 0.33 | 0.17 |
| Molybdenum | U | 2450 | mg/kg | 2.0 | 5.0 | 5.5 | 4.3 | 16 | 14 | 5.6 | 14 | 8.1 | < 2.0 |
| Nickel | U | 2450 | mg/kg | 0.50 | 82 | 80 | 59 | 120 | 96 | 86 | 90 | 79 | 45 |
| Lead | U | 2450 | mg/kg | 0.50 | 180 | 270 | 260 | 980 | 1700 | 1100 | 740 | 640 | 110 |
| Antimony | N | 2450 | mg/kg | 2.0 | 6.8 | 7.2 | 6.4 | 22 | 17 | 9.9 | 13 | 17 | 2.6 |
| Selenium | U | 2450 | mg/kg | 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Zinc | U | 2450 | mg/kg | 0.50 | 750 | 640 | 570 | 1300 | 1500 | 650 | 1100 | 940 | 210 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 5.0 | 44 | 58 | 48 | 68 | 71 | 56 | 53 | 64 | 36 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Total Organic Carbon | U | 2625 | % | 0.20 | 0.98 | 1.2 | 1.7 | 7.5 | 1.4 | 0.22 | 22 | 4.4 | 1.6 |
| Mineral Oil | N | 2670 | mg/kg | 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH >C6-C10 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH >C10-C21 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 11 |
| TPH >C21-C40 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 38 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | 49 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 11 |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | | | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | | | 462844 | 462845 | 462846 | 462847 | 462848 | 462849 | 462850 | 462851 | 462852 |
| | | Client Sample ID.: | | | SO-TP19-01 | SO-TP19-02 | SO-TP9-01 | SO-TP10-01 | SO-TP11-01 | SO-TP5-01 | SO-TP4-01 | SO-TP3-01 | SO-TP1-01 |
| | | Sample Type: | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | | | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 02-Jun-2017 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| Aromatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 38 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | 49 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | 49 |
| Dichlorodifluoromethane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Chloromethane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Vinyl Chloride | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Bromomethane | U | 2760 | µg/kg | 20 | | | | | | | | | |
| Chloroethane | U | 2760 | µg/kg | 2.0 | | | | | | | | | |
| Trichlorofluoromethane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| 1,1-Dichloroethene | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Trans 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| 1,1-Dichloroethane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| cis 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Bromochloromethane | U | 2760 | µg/kg | 5.0 | | | | | | | | | |
| Trichloromethane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| 1,1,1-Trichloroethane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Tetrachloromethane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| 1,1-Dichloropropene | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Benzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | U | 2760 | µg/kg | 2.0 | | | | | | | | | |
| Trichloroethene | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| 1,2-Dichloropropane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Dibromomethane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Bromodichloromethane | U | 2760 | µg/kg | 5.0 | | | | | | | | | |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | | | | | | | | | |
| Toluene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | | | | | | | | | |
| 1,1,2-Trichloroethane | U | 2760 | µg/kg | 10 | | | | | | | | | |
| Tetrachloroethene | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| 1,3-Dichloropropane | U | 2760 | µg/kg | 2.0 | | | | | | | | | |
| Dibromochloromethane | U | 2760 | µg/kg | 10 | | | | | | | | | |
| 1,2-Dibromoethane | U | 2760 | µg/kg | 5.0 | | | | | | | | | |
| Chlorobenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | U | 2760 | µg/kg | 2.0 | | | | | | | | | |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | U | 2760 | µg/kg | 1.0 | | | | | | | | | |
| Tribromomethane | U | 2760 | µg/kg | 1.0 | | | | | | | | | |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | 462844 | 462845 | 462846 | 462847 | 462848 | 462849 | 462850 | 462851 | 462852 |
| | | Client Sample ID.: | SO-TP19-01 | SO-TP19-02 | SO-TP9-01 | SO-TP10-01 | SO-TP11-01 | SO-TP5-01 | SO-TP4-01 | SO-TP3-01 | SO-TP1-01 |
| | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 02-Jun-2017 |
| | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | |
| Isopropylbenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| Bromobenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | | | | | | | | |
| N-Propylbenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 2-Chlorotoluene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 1,3,5-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 4-Chlorotoluene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| Tert-Butylbenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 1,2,4-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| Sec-Butylbenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 1,3-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 4-Isopropyltoluene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 1,4-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| N-Butylbenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 1,2-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | U | 2760 | µg/kg | 50 | | | | | | | | |
| 1,2,4-Trichlorobenzene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| Hexachlorobutadiene | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| 1,2,3-Trichlorobenzene | U | 2760 | µg/kg | 2.0 | | | | | | | | |
| Methyl Tert-Butyl Ether | U | 2760 | µg/kg | 1.0 | | | | | | | | |
| N-Nitrosodimethylamine | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| Phenol | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| 2-Chlorophenol | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| Bis-(2-Chloroethyl)Ether | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| 1,3-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | | | | | | | | |
| 1,2-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| 2-Methylphenol | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| Bis(2-Chloroisopropyl)Ether | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | | | | | | | | |
| N-Nitrosodi-n-propylamine | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| 4-Methylphenol | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| Nitrobenzene | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| Isophorone | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | | | | | | | | |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | | | | | | | | |
| Bis(2-Chloroethoxy)Methane | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| 2,4-Dichlorophenol | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| 1,2,4-Trichlorobenzene | U | 2790 | mg/kg | 0.50 | | | | | | | | |
| Naphthalene | U | 2790 | mg/kg | 0.50 | | | | | | | | |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | 462844 | 462845 | 462846 | 462847 | 462848 | 462849 | 462850 | 462851 | 462852 |
| | | Client Sample ID.: | SO-TP19-01 | SO-TP19-02 | SO-TP9-01 | SO-TP10-01 | SO-TP11-01 | SO-TP5-01 | SO-TP4-01 | SO-TP3-01 | SO-TP1-01 |
| | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 02-Jun-2017 |
| | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Hexachlorobutadiene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 4-Chloro-3-Methylphenol | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 2-Methylnaphthalene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 2,4,6-Trichlorophenol | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 2,4,5-Trichlorophenol | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 2-Chloronaphthalene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 2-Nitroaniline | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Acenaphthylene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Dimethylphthalate | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 2,6-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Acenaphthene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Dibenzofuran | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 4-Chlorophenylphenylether | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 2,4-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Fluorene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Diethyl Phthalate | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 4-Nitroaniline | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Azobenzene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| 4-Bromophenylphenyl Ether | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Hexachlorobenzene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Phenanthrene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Anthracene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Carbazole | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Di-N-Butyl Phthalate | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Fluoranthene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Pyrene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Butylbenzyl Phthalate | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Benzo[a]anthracene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Chrysene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Di-N-Octyl Phthalate | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Benzo[b]fluoranthene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Benzo[k]fluoranthene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Benzo[a]pyrene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | | Chemtest Sample ID.: | 462844 | 462845 | 462846 | 462847 | 462848 | 462849 | 462850 | 462851 | 462852 |
| | | | | Client Sample ID.: | SO-TP19-01 | SO-TP19-02 | SO-TP9-01 | SO-TP10-01 | SO-TP11-01 | SO-TP5-01 | SO-TP4-01 | SO-TP3-01 | SO-TP1-01 |
| | | | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | Date Sampled: | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 01-Jun-2017 | 02-Jun-2017 |
| | | | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| Indeno(1,2,3-c,d)Pyrene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Dibenz(a,h)Anthracene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Benzo[g,h,i]perylene | U | 2790 | mg/kg | 0.50 | | | | | | | | | |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.43 | < 0.10 | 0.11 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.19 | 1.2 |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.33 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.67 | 3.1 |
| Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.74 | 2.8 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.30 | 0.95 |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.31 | 0.72 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 1.0 | 1.2 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.39 | 0.25 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.52 | 0.82 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.91 | 0.51 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 1.0 | 0.56 |
| Coronene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | 6.0 | 13 |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | | Chemtest Sample ID.: | 462853 | 462854 | 462855 | 462856 | 462857 | 462858 | 462859 | 462860 | 462861 |
| | | | | Client Sample ID.: | SO-TP1-02 | SO-TP2-01 | SO-TP27-01 | SO-TP25-01 | SO-TP28-01 | SO-TP29-01 | SO-TP31-01 | SO-TP18-01 | SO-TP23-01 |
| | | | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | Date Sampled: | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 |
| | | | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| ACM Type | U | 2192 | | N/A | - | - | - | - | - | - | - | - | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 4.6 | 19 | 13 | 15 | 17 | 17 | 10 | 12 | 14 |
| Dry Matter | N | | % | N/A | 95 | 81 | 87 | 85 | 83 | 83 | 90 | 88 | 86 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 16 | 21 | 13 | 13 | 17 | 15 | 22 | 16 | 26 |
| Barium | U | 2450 | mg/kg | 10 | 56 | 190 | 83 | 72 | 650 | 95 | 110 | 150 | 290 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 0.32 | 0.48 | < 0.10 | < 0.10 | 0.46 | 0.18 | 0.27 | 0.39 | 1.2 |
| Chromium | U | 2450 | mg/kg | 1.0 | 20 | 33 | 36 | 31 | 49 | 32 | 39 | 35 | 38 |
| Copper | U | 2450 | mg/kg | 0.50 | 24 | 52 | 27 | 24 | 39 | 25 | 28 | 80 | 66 |
| Mercury | U | 2450 | mg/kg | 0.10 | < 0.10 | 0.20 | 0.10 | < 0.10 | 0.17 | < 0.10 | < 0.10 | 0.33 | 0.65 |
| Molybdenum | U | 2450 | mg/kg | 2.0 | < 2.0 | 2.7 | < 2.0 | < 2.0 | 2.1 | < 2.0 | < 2.0 | < 2.0 | 2.5 |
| Nickel | U | 2450 | mg/kg | 0.50 | 32 | 46 | 38 | 34 | 46 | 36 | 47 | 50 | 51 |
| Lead | U | 2450 | mg/kg | 0.50 | 32 | 130 | 29 | 24 | 600 | 44 | 30 | 97 | 130 |
| Antimony | N | 2450 | mg/kg | 2.0 | < 2.0 | 2.2 | < 2.0 | < 2.0 | 2.4 | < 2.0 | < 2.0 | 2.1 | 3.1 |
| Selenium | U | 2450 | mg/kg | 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Zinc | U | 2450 | mg/kg | 0.50 | 72 | 690 | 72 | 62 | 470 | 84 | 84 | 220 | 1100 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 5.0 | 20 | 33 | 36 | 31 | 49 | 32 | 39 | 35 | 38 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Total Organic Carbon | U | 2625 | % | 0.20 | 0.34 | 3.2 | 0.88 | 1.1 | 2.1 | 1.6 | 1.1 | 1.3 | 2.6 |
| Mineral Oil | N | 2670 | mg/kg | 10 | < 10 | < 10 | < 10 | 42 | 63 | < 10 | 260 | 86 | 160 |
| TPH >C6-C10 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH >C10-C21 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 4.2 | < 1.0 | 9.7 | 4.1 | 12 |
| TPH >C21-C40 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 59 | 150 | < 1.0 | 300 | 170 | 270 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | < 10 | < 10 | < 10 | 59 | 160 | < 10 | 300 | 180 | 270 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 9.7 | 1.7 | 9.7 |
| Aliphatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | 42 | 63 | < 1.0 | 260 | 84 | 150 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 5.2 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 | < 5.0 | 42 | 63 | < 5.0 | 260 | 86 | 160 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 4.2 | < 1.0 | < 1.0 | 2.4 | 1.9 |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | | | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | | | Chemtest Sample ID.: | 462853 | 462854 | 462855 | 462856 | 462857 | 462858 | 462859 | 462860 | 462861 |
| | | | | | Client Sample ID.: | SO-TP1-02 | SO-TP2-01 | SO-TP27-01 | SO-TP25-01 | SO-TP28-01 | SO-TP29-01 | SO-TP31-01 | SO-TP18-01 | SO-TP23-01 |
| | | | | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | | Date Sampled: | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 |
| | | | | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | | |
| Aromatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | | < 1.0 | < 1.0 | < 1.0 | 17 | 90 | < 1.0 | 38 | 90 | 110 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | | < 5.0 | < 5.0 | < 5.0 | 17 | 94 | < 5.0 | 38 | 93 | 110 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | | < 10 | < 10 | < 10 | 59 | 160 | < 10 | 300 | 180 | 270 |
| Dichlorodifluoromethane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Chloromethane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Vinyl Chloride | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Bromomethane | U | 2760 | µg/kg | 20 | | | < 20 | | | | | | | |
| Chloroethane | U | 2760 | µg/kg | 2.0 | | | < 2.0 | | | | | | | |
| Trichlorofluoromethane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| 1,1-Dichloroethene | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Trans 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| 1,1-Dichloroethane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| cis 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Bromochloromethane | U | 2760 | µg/kg | 5.0 | | | < 5.0 | | | | | | | |
| Trichloromethane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| 1,1,1-Trichloroethane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Tetrachloromethane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| 1,1-Dichloropropene | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Benzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | U | 2760 | µg/kg | 2.0 | | | < 2.0 | | | | | | | |
| Trichloroethene | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| 1,2-Dichloropropane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Dibromomethane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Bromodichloromethane | U | 2760 | µg/kg | 5.0 | | | < 5.0 | | | | | | | |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | | | < 10 | | | | | | | |
| Toluene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | | | < 10 | | | | | | | |
| 1,1,2-Trichloroethane | U | 2760 | µg/kg | 10 | | | < 10 | | | | | | | |
| Tetrachloroethene | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| 1,3-Dichloropropane | U | 2760 | µg/kg | 2.0 | | | < 2.0 | | | | | | | |
| Dibromochloromethane | U | 2760 | µg/kg | 10 | | | < 10 | | | | | | | |
| 1,2-Dibromoethane | U | 2760 | µg/kg | 5.0 | | | < 5.0 | | | | | | | |
| Chlorobenzene | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| 1,1,1,2-Tetrachloroethane | U | 2760 | µg/kg | 2.0 | | | < 2.0 | | | | | | | |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |
| Tribromomethane | U | 2760 | µg/kg | 1.0 | | | < 1.0 | | | | | | | |

Chemtest
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# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | | | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | | | 462853 | 462854 | 462855 | 462856 | 462857 | 462858 | 462859 | 462860 | 462861 |
| | | Client Sample ID.: | | | SO-TP1-02 | SO-TP2-01 | SO-TP27-01 | SO-TP25-01 | SO-TP28-01 | SO-TP29-01 | SO-TP31-01 | SO-TP18-01 | SO-TP23-01 |
| | | Sample Type: | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | | | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| Isopropylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| Bromobenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | | < 50 | | | | | | | |
| N-Propylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 2-Chlorotoluene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 1,3,5-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 4-Chlorotoluene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| Tert-Butylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 1,2,4-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| Sec-Butylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 1,3-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 4-Isopropyltoluene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 1,4-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| N-Butylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 1,2-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 1,2-Dibromo-3-Chloropropane | U | 2760 | µg/kg | 50 | | < 50 | | | | | | | |
| 1,2,4-Trichlorobenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| Hexachlorobutadiene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| 1,2,3-Trichlorobenzene | U | 2760 | µg/kg | 2.0 | | < 2.0 | | | | | | | |
| Methyl Tert-Butyl Ether | U | 2760 | µg/kg | 1.0 | | < 1.0 | | | | | | | |
| N-Nitrosodimethylamine | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| Phenol | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 2-Chlorophenol | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| Bis-(2-Chloroethyl)Ether | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 1,3-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 1,2-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 2-Methylphenol | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| Bis(2-Chloroisopropyl)Ether | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| N-Nitrosodi-n-propylamine | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 4-Methylphenol | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| Nitrobenzene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| Isophorone | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| Bis(2-Chloroethoxy)Methane | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 2,4-Dichlorophenol | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| 1,2,4-Trichlorobenzene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |
| Naphthalene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | Chemtest Sample ID.: | 462853 | 462854 | 462855 | 462856 | 462857 | 462858 | 462859 | 462860 | 462861 |
| | | Client Sample ID.: | SO-TP1-02 | SO-TP2-01 | SO-TP27-01 | SO-TP25-01 | SO-TP28-01 | SO-TP29-01 | SO-TP31-01 | SO-TP18-01 | SO-TP23-01 |
| | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | Date Sampled: | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 |
| | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Hexachlorobutadiene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 4-Chloro-3-Methylphenol | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 2-Methylnaphthalene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 2,4,6-Trichlorophenol | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 2,4,5-Trichlorophenol | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 2-Chloronaphthalene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 2-Nitroaniline | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Acenaphthylene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Dimethylphthalate | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 2,6-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Acenaphthene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Dibenzofuran | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 4-Chlorophenylphenylether | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 2,4-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Fluorene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Diethyl Phthalate | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 4-Nitroaniline | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Azobenzene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| 4-Bromophenylphenyl Ether | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Hexachlorobenzene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Phenanthrene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Anthracene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Carbazole | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Di-N-Butyl Phthalate | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Fluoranthene | U | 2790 | mg/kg | 0.50 | | 0.71 | | | | | | |
| Pyrene | U | 2790 | mg/kg | 0.50 | | 0.59 | | | | | | |
| Butylbenzyl Phthalate | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Benzo[a]anthracene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Chrysene | U | 2790 | mg/kg | 0.50 | | 0.52 | | | | | | |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Di-N-Octyl Phthalate | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Benzo[b]fluoranthene | U | 2790 | mg/kg | 0.50 | | 0.76 | | | | | | |
| Benzo[k]fluoranthene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | |
| Benzo[a]pyrene | U | 2790 | mg/kg | 0.50 | | 0.58 | | | | | | |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | | | | Chemtest Job No.: | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 | 17-14011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | | | Chemtest Sample ID.: | 462853 | 462854 | 462855 | 462856 | 462857 | 462858 | 462859 | 462860 | 462861 |
| | | | | | Client Sample ID.: | SO-TP1-02 | SO-TP2-01 | SO-TP27-01 | SO-TP25-01 | SO-TP28-01 | SO-TP29-01 | SO-TP31-01 | SO-TP18-01 | SO-TP23-01 |
| | | | | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | | Date Sampled: | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 | 02-Jun-2017 |
| | | | | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | | |
| Indeno(1,2,3-c,d)Pyrene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | | |
| Dibenz(a,h)Anthracene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | | |
| Benzo[g,h,i]perylene | U | 2790 | mg/kg | 0.50 | | < 0.50 | | | | | | | | |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.81 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.16 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 2.0 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 1.8 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.59 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.64 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Coronene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | 6.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |

# Results - Soil

**Project: Skerries Edgeworthstown**

| **Client: MULROY ENVIRONMENTAL** | | | **Chemtest Job No.:** | | 17-14011 |
|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | **Chemtest Sample ID.:** | | 462937 |
| | | | Client Sample ID.: | | SO-TP33-01 |
| | | | Sample Type: | | SOIL |
| | | | Date Sampled: | | 01-Jun-2017 |
| | | | Asbestos Lab: | | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| ACM Type | U | 2192 | | N/A | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 13 |
| Dry Matter | N | | % | N/A | 87 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 24 |
| Barium | U | 2450 | mg/kg | 10 | 180 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 3.8 |
| Chromium | U | 2450 | mg/kg | 1.0 | 43 |
| Copper | U | 2450 | mg/kg | 0.50 | 68 |
| Mercury | U | 2450 | mg/kg | 0.10 | 0.15 |
| Molybdenum | U | 2450 | mg/kg | 2.0 | 6.3 |
| Nickel | U | 2450 | mg/kg | 0.50 | 51 |
| Lead | U | 2450 | mg/kg | 0.50 | 110 |
| Antimony | N | 2450 | mg/kg | 2.0 | 6.3 |
| Selenium | U | 2450 | mg/kg | 0.20 | < 0.20 |
| Zinc | U | 2450 | mg/kg | 0.50 | 240 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 5.0 | 43 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 |
| Total Organic Carbon | U | 2625 | % | 0.20 | 2.7 |
| Mineral Oil | N | 2670 | mg/kg | 10 | < 10 |
| TPH >C6-C10 | N | 2670 | mg/kg | 1.0 | < 1.0 |
| TPH >C10-C21 | N | 2670 | mg/kg | 1.0 | < 1.0 |
| TPH >C21-C40 | N | 2670 | mg/kg | 1.0 | < 1.0 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | < 10 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 |

# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | | Chemtest Job No.: | | 17-14011 |
|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | Chemtest Sample ID.: | | 462937 |
| | | | Client Sample ID.: | | SO-TP33-01 |
| | | | Sample Type: | | SOIL |
| | | | Date Sampled: | | 01-Jun-2017 |
| | | | Asbestos Lab: | | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| Aromatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | < 10 |
| Dichlorodifluoromethane | U | 2760 | µg/kg | 1.0 | |
| Chloromethane | U | 2760 | µg/kg | 1.0 | |
| Vinyl Chloride | U | 2760 | µg/kg | 1.0 | |
| Bromomethane | U | 2760 | µg/kg | 20 | |
| Chloroethane | U | 2760 | µg/kg | 2.0 | |
| Trichlorofluoromethane | U | 2760 | µg/kg | 1.0 | |
| 1,1-Dichloroethene | U | 2760 | µg/kg | 1.0 | |
| Trans 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | |
| 1,1-Dichloroethane | U | 2760 | µg/kg | 1.0 | |
| cis 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | |
| Bromochloromethane | U | 2760 | µg/kg | 5.0 | |
| Trichloromethane | U | 2760 | µg/kg | 1.0 | |
| 1,1,1-Trichloroethane | U | 2760 | µg/kg | 1.0 | |
| Tetrachloromethane | U | 2760 | µg/kg | 1.0 | |
| 1,1-Dichloropropene | U | 2760 | µg/kg | 1.0 | |
| Benzene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| 1,2-Dichloroethane | U | 2760 | µg/kg | 2.0 | |
| Trichloroethene | U | 2760 | µg/kg | 1.0 | |
| 1,2-Dichloropropane | U | 2760 | µg/kg | 1.0 | |
| Dibromomethane | U | 2760 | µg/kg | 1.0 | |
| Bromodichloromethane | U | 2760 | µg/kg | 5.0 | |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | |
| Toluene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | |
| 1,1,2-Trichloroethane | U | 2760 | µg/kg | 10 | |
| Tetrachloroethene | U | 2760 | µg/kg | 1.0 | |
| 1,3-Dichloropropane | U | 2760 | µg/kg | 2.0 | |
| Dibromochloromethane | U | 2760 | µg/kg | 10 | |
| 1,2-Dibromoethane | U | 2760 | µg/kg | 5.0 | |
| Chlorobenzene | U | 2760 | µg/kg | 1.0 | |
| 1,1,1,2-Tetrachloroethane | U | 2760 | µg/kg | 2.0 | |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 |
| Styrene | U | 2760 | µg/kg | 1.0 | |
| Tribromomethane | U | 2760 | µg/kg | 1.0 | |

# Results - Soil

**Project: Skerries Edgeworthstown**

| Client: MULROY ENVIRONMENTAL | | | Chemtest Job No.: | | 17-14011 |
|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | Chemtest Sample ID.: | | 462937 |
| | | | Client Sample ID.: | | SO-TP33-01 |
| | | | Sample Type: | | SOIL |
| | | | Date Sampled: | | 01-Jun-2017 |
| | | | Asbestos Lab: | | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| Isopropylbenzene | U | 2760 | µg/kg | 1.0 | |
| Bromobenzene | U | 2760 | µg/kg | 1.0 | |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | |
| N-Propylbenzene | U | 2760 | µg/kg | 1.0 | |
| 2-Chlorotoluene | U | 2760 | µg/kg | 1.0 | |
| 1,3,5-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | |
| 4-Chlorotoluene | U | 2760 | µg/kg | 1.0 | |
| Tert-Butylbenzene | U | 2760 | µg/kg | 1.0 | |
| 1,2,4-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | |
| Sec-Butylbenzene | U | 2760 | µg/kg | 1.0 | |
| 1,3-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | |
| 4-Isopropyltoluene | U | 2760 | µg/kg | 1.0 | |
| 1,4-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | |
| N-Butylbenzene | U | 2760 | µg/kg | 1.0 | |
| 1,2-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | |
| 1,2-Dibromo-3-Chloropropane | U | 2760 | µg/kg | 50 | |
| 1,2,4-Trichlorobenzene | U | 2760 | µg/kg | 1.0 | |
| Hexachlorobutadiene | U | 2760 | µg/kg | 1.0 | |
| 1,2,3-Trichlorobenzene | U | 2760 | µg/kg | 2.0 | |
| Methyl Tert-Butyl Ether | U | 2760 | µg/kg | 1.0 | |
| N-Nitrosodimethylamine | U | 2790 | mg/kg | 0.50 | |
| Phenol | U | 2790 | mg/kg | 0.50 | |
| 2-Chlorophenol | U | 2790 | mg/kg | 0.50 | |
| Bis-(2-Chloroethyl)Ether | U | 2790 | mg/kg | 0.50 | |
| 1,3-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | |
| 1,2-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | |
| 2-Methylphenol | U | 2790 | mg/kg | 0.50 | |
| Bis(2-Chloroisopropyl)Ether | U | 2790 | mg/kg | 0.50 | |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | |
| N-Nitrosodi-n-propylamine | U | 2790 | mg/kg | 0.50 | |
| 4-Methylphenol | U | 2790 | mg/kg | 0.50 | |
| Nitrobenzene | U | 2790 | mg/kg | 0.50 | |
| Isophorone | U | 2790 | mg/kg | 0.50 | |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | |
| Bis(2-Chloroethoxy)Methane | U | 2790 | mg/kg | 0.50 | |
| 2,4-Dichlorophenol | U | 2790 | mg/kg | 0.50 | |
| 1,2,4-Trichlorobenzene | U | 2790 | mg/kg | 0.50 | |
| Naphthalene | U | 2790 | mg/kg | 0.50 | |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries Edgeworthstown**

| **Client: MULROY ENVIRONMENTAL** | | | **Chemtest Job No.:** | | 17-14011 |
|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | **Chemtest Sample ID.:** | | 462937 |
| | | | Client Sample ID.: | | SO-TP33-01 |
| | | | Sample Type: | | SOIL |
| | | | Date Sampled: | | 01-Jun-2017 |
| | | | Asbestos Lab: | | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | |
| Hexachlorobutadiene | U | 2790 | mg/kg | 0.50 | |
| 4-Chloro-3-Methylphenol | U | 2790 | mg/kg | 0.50 | |
| 2-Methylnaphthalene | U | 2790 | mg/kg | 0.50 | |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | |
| 2,4,6-Trichlorophenol | U | 2790 | mg/kg | 0.50 | |
| 2,4,5-Trichlorophenol | U | 2790 | mg/kg | 0.50 | |
| 2-Chloronaphthalene | U | 2790 | mg/kg | 0.50 | |
| 2-Nitroaniline | U | 2790 | mg/kg | 0.50 | |
| Acenaphthylene | U | 2790 | mg/kg | 0.50 | |
| Dimethylphthalate | U | 2790 | mg/kg | 0.50 | |
| 2,6-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | |
| Acenaphthene | U | 2790 | mg/kg | 0.50 | |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | |
| Dibenzofuran | U | 2790 | mg/kg | 0.50 | |
| 4-Chlorophenylphenylether | U | 2790 | mg/kg | 0.50 | |
| 2,4-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | |
| Fluorene | U | 2790 | mg/kg | 0.50 | |
| Diethyl Phthalate | U | 2790 | mg/kg | 0.50 | |
| 4-Nitroaniline | U | 2790 | mg/kg | 0.50 | |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | |
| Azobenzene | U | 2790 | mg/kg | 0.50 | |
| 4-Bromophenylphenyl Ether | U | 2790 | mg/kg | 0.50 | |
| Hexachlorobenzene | U | 2790 | mg/kg | 0.50 | |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | |
| Phenanthrene | U | 2790 | mg/kg | 0.50 | |
| Anthracene | U | 2790 | mg/kg | 0.50 | |
| Carbazole | U | 2790 | mg/kg | 0.50 | |
| Di-N-Butyl Phthalate | U | 2790 | mg/kg | 0.50 | |
| Fluoranthene | U | 2790 | mg/kg | 0.50 | |
| Pyrene | U | 2790 | mg/kg | 0.50 | |
| Butylbenzyl Phthalate | U | 2790 | mg/kg | 0.50 | |
| Benzo[a]anthracene | U | 2790 | mg/kg | 0.50 | |
| Chrysene | U | 2790 | mg/kg | 0.50 | |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | |
| Di-N-Octyl Phthalate | U | 2790 | mg/kg | 0.50 | |
| Benzo[b]fluoranthene | U | 2790 | mg/kg | 0.50 | |
| Benzo[k]fluoranthene | U | 2790 | mg/kg | 0.50 | |
| Benzo[a]pyrene | U | 2790 | mg/kg | 0.50 | |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Skerries Edgeworthstown**

| **Client: MULROY ENVIRONMENTAL** | | | **Chemtest Job No.:** | | 17-14011 |
|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | **Chemtest Sample ID.:** | | 462937 |
| | | | Client Sample ID.: | | SO-TP33-01 |
| | | | Sample Type: | | SOIL |
| | | | Date Sampled: | | 01-Jun-2017 |
| | | | Asbestos Lab: | | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| Indeno(1,2,3-c,d)Pyrene | U | 2790 | mg/kg | 0.50 | |
| Dibenz(a,h)Anthracene | U | 2790 | mg/kg | 0.50 | |
| Benzo[g,h,i]perylene | U | 2790 | mg/kg | 0.50 | |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Coronene | N | 2800 | mg/kg | 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 |

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462827 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP6-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 4.2 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 4.7 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.032 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0014 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.042 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.00026 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.013 | 0.13 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0051 | 0.051 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.011 | 0.11 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0028 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0031 | 0.031 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0048 | 0.048 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.096 | 0.96 | 4 | 50 | 200 |
| Chloride | 1220 | U | 4.9 | 49 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.099 | < 1.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 1400 | 14000 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 1400 | 14000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 10 | 100 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 16 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462828 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP12-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.2 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 4.5 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.1 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.11 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0029 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.040 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0042 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.015 | 0.15 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0015 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0027 | 0.027 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0028 | 0.028 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0060 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.6 | 26 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.29 | 2.9 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 70 | 700 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 150 | 1500 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 10 | 100 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 13 |



**Waste Acceptance Criteria**

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Chemtest
The right chemistry to deliver results

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462829 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP12-02 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 4.2 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 7.8 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.1 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.12 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0026 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.056 | 0.56 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0066 | 0.066 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.015 | 0.15 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0028 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0034 | 0.034 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0053 | 0.053 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.039 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 44 | 440 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.098 | < 1.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 1300 | 13000 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 1300 | 13000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 11 | 110 | 500 | 800 | 1000 |



| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 13 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462830 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP7-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 5.1 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 8.9 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 630 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.5 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.044 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0047 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.070 | 0.70 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.00014 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0036 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.076 | 0.76 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0040 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | 0.0016 | 0.016 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.012 | 0.12 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0033 | 0.033 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.014 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 38 | 380 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.20 | 2.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 130 | 1300 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 340 | 3400 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 14 | 140 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 15 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462831 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP13-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 3.7 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 6.4 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 770 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.3 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.059 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0037 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.087 | 0.87 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.069 | 0.69 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0038 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.025 | 0.25 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0047 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0064 | 0.064 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0023 | 0.023 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.013 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 11 | 110 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.19 | 1.9 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 190 | 1900 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 330 | 3300 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 15 | 150 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 13 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462832 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP14-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.9 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 5.5 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 2.2 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.037 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0033 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.082 | 0.82 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.0029 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0056 | 0.056 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.022 | 0.22 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0031 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.042 | 0.42 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0023 | 0.023 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.015 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 7.7 | 77 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.23 | 2.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 130 | 1300 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 290 | 2900 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 14 | 140 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 13 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Chemtest
The right chemistry to deliver results

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462833 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP14-02 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 5.3 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 15 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 1400 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 2.7 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.039 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0051 | 0.051 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.15 | 1.5 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.13 | 1.3 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0048 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.032 | 0.32 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.013 | 0.13 | 0.4 | 10 | 40 |
| Lead | 1450 | U | 0.0011 | 0.011 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.020 | 0.20 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0030 | 0.030 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.025 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 25 | 250 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.18 | 1.8 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 400 | 4000 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 600 | 6000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 22 | 220 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 20 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462834 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP15-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 5.5 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 12 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 1100 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 10 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.050 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.011 | 0.11 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.10 | 1.0 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.00012 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0020 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.061 | 0.61 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.010 | 0.10 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0067 | 0.067 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0047 | 0.047 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.015 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 61 | 610 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.19 | 1.9 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 320 | 3200 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 650 | 6500 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 35 | 350 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 20 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Chemtest Sample ID:** | 462835 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP15-02 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | |
| Total Organic Carbon | 2625 | U | % | 2.6 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.1 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.7 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.020 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0075 | 0.075 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.038 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0068 | 0.068 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.023 | 0.23 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0030 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0043 | 0.043 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0033 | 0.033 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0060 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 13 | 130 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.26 | 2.6 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 110 | 1100 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 250 | 2500 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 16 | 160 | 500 | 800 | 1000 |



| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 19 |

**Waste Acceptance Criteria**

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462836 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP16-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 2.8 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 7.6 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.1 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.042 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0025 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.072 | 0.72 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0031 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.026 | 0.26 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0037 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.014 | 0.14 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0025 | 0.025 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.024 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 6.4 | 64 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.18 | 1.8 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 240 | 2400 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 410 | 4100 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 15 | 150 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 18 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462837 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP17-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.8 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 5.2 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 260 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 2.2 | 100 | -- | -- |
| pH | 2010 | U | | 8.1 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.014 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.0051 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0018 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0022 | < 0.050 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0011 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | < 0.0010 | < 0.010 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0013 | 0.013 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.012 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 1.5 | 15 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.28 | 2.8 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 2.2 | 22 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 88 | 880 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 9.7 | 97 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 13 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462838 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP8-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 4.2 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 10 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 2800 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 38 | 100 | -- | -- |
| pH | 2010 | U | | 8.2 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.016 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0063 | 0.063 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.14 | 1.4 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0031 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.034 | 0.34 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0058 | 0.058 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0082 | 0.082 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0029 | 0.029 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.020 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 23 | 230 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.23 | 2.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 270 | 2700 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 460 | 4600 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 20 | 200 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 16 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462839 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-SP1-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 31-May-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 2.0 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 4.0 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.3 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.013 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0015 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.052 | 0.52 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0038 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.014 | 0.14 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | < 0.0010 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0035 | 0.035 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0020 | 0.020 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0043 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 5.5 | 55 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.19 | 1.9 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 53 | 530 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 110 | 1100 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 9.9 | 99 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 8.0 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462840 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP22-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 4.3 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 9.5 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 350 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 2.7 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.018 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0055 | 0.055 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.043 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0018 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.049 | 0.49 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0047 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | 0.0011 | 0.011 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.010 | 0.10 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0026 | 0.026 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0047 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 23 | 230 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.23 | 2.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 38 | 380 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 240 | 2400 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 22 | 220 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 18 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Chemtest Sample ID:** | 462841 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP21-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | |
| Total Organic Carbon | 2625 | U | % | 4.3 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 8.3 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 2.7 | 100 | -- | -- |
| pH | 2010 | U | | 8.3 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.039 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0047 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.083 | 0.83 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0030 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.045 | 0.45 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0054 | 0.054 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0095 | 0.095 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0027 | 0.027 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.019 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 16 | 160 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.18 | 1.8 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 230 | 2300 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 430 | 4300 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 15 | 150 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 18 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Chemtest Sample ID:** | 462842 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP20-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | |
| Total Organic Carbon | 2625 | U | % | 1.6 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.8 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.1 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.042 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0012 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.050 | 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0033 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0097 | 0.097 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0012 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0041 | 0.041 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0015 | 0.015 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.014 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.8 | 28 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.19 | 1.9 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 130 | 1300 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 250 | 2500 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 9.6 | 96 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 9.9 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462843 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP20-02 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.8 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.2 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.038 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0026 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.013 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.013 | 1.3 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0096 | 0.096 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0031 | < 0.050 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0030 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | < 0.0010 | < 0.010 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0017 | 0.017 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0021 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 1.7 | 17 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.19 | 1.9 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 36 | 360 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 90 | 900 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 14 | 140 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 12 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462844 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP19-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 0.98 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.2 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.7 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.0080 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0031 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.025 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.00040 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.0020 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0040 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.016 | 0.16 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0027 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0017 | 0.017 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0058 | 0.058 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.062 | 0.62 | 4 | 50 | 200 |
| Chloride | 1220 | U | 1.9 | 19 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.064 | < 1.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 1600 | 16000 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 1600 | 16000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 12 | 120 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 14 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Chemtest Sample ID:** | 462845 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP19-02 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | |
| Total Organic Carbon | 2625 | U | % | 1.2 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.2 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.7 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.010 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.046 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0019 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.010 | 0.10 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | < 0.0010 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0032 | 0.032 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0025 | 0.025 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.011 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 1.4 | 14 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.13 | 1.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 310 | 3100 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 340 | 3400 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 7.7 | 77 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 14 |



**Waste Acceptance Criteria**

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462846 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP9-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.7 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.0 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.022 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0013 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.044 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0022 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.022 | 0.22 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | < 0.0010 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0021 | 0.021 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0029 | 0.029 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.013 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 4.1 | 41 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.13 | 1.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 130 | 1300 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 210 | 2100 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 9.0 | 90 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 8.5 |



**Waste Acceptance Criteria**

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462847 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP10-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 7.5 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 11 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.5 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.016 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0021 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.034 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.00047 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.037 | 0.37 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0042 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | 0.00068 | 0.0068 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.018 | 0.18 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0037 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0098 | 0.098 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0079 | 0.079 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.14 | 1.4 | 4 | 50 | 200 |
| Chloride | 1220 | U | 3.0 | 30 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.067 | < 1.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 1600 | 16000 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 1600 | 16000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 8.7 | 87 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 25 |



**Waste Acceptance Criteria**

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462848 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP11-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.4 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.5 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.022 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0011 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.032 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.00043 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0026 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | 0.00064 | 0.0064 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.020 | 0.20 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0028 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0040 | 0.040 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0065 | 0.065 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.058 | 0.58 | 4 | 50 | 200 |
| Chloride | 1220 | U | 3.9 | 39 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.067 | < 1.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 1600 | 16000 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 1600 | 16000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 9.9 | 99 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 23 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462849 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP5-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 0.22 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 1.5 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.9 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.024 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.039 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.000010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.011 | 0.11 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0022 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | 0.00058 | 0.0058 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.010 | 0.10 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0014 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0012 | 0.012 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0026 | 0.026 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.028 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 3.7 | 37 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.14 | 1.4 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 440 | 4400 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 490 | 4900 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 7.6 | 76 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 14 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Chemtest Sample ID:** | 462850 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP4-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | |
| Total Organic Carbon | 2625 | U | % | 22 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 24 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.3 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | < 0.0020 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0025 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.053 | 0.53 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.00011 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0036 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | 0.00054 | 0.0054 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.010 | 0.10 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0014 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | 0.0028 | 0.028 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0056 | 0.056 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0065 | 0.065 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.065 | 0.65 | 4 | 50 | 200 |
| Chloride | 1220 | U | 1.8 | 18 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.10 | 1.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 760 | 7600 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 1200 | 12000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 11 | 110 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 25 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462851 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP3-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 4.4 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 7.6 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 6.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.5 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.011 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0020 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.055 | 0.55 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.0016 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0061 | 0.061 | 2 | 50 | 100 |
| Mercury | 1450 | U | 0.00055 | 0.0055 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.015 | 0.15 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0019 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0046 | 0.046 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0020 | 0.020 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.028 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.1 | 21 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.10 | 1.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 560 | 5600 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 1000 | 10000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 12 | 120 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 13 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Chemtest
The right chemistry to deliver results

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| **Chemtest Job No:** | 17-14011 | | | | **Landfill Waste Acceptance Criteria Limits** | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Sample ID:** | 462852 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP1-01 | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | |
| Total Organic Carbon | 2625 | U | % | 1.6 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.7 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 49 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 13 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.029 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0016 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.032 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.0040 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0067 | 0.067 | 2 | 50 | 100 |
| Mercury | 1450 | U | 0.00052 | 0.0052 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0069 | 0.069 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | < 0.0010 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0031 | 0.031 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | < 0.0010 | < 0.010 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0044 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 1.8 | 18 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.19 | 1.9 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 53 | 530 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 100 | 1000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 13 | 130 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 8.9 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462853 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP1-02 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 0.34 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 0.92 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.4 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.011 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0013 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.015 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0027 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0040 | < 0.050 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | < 0.0010 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | < 0.0010 | < 0.010 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | < 0.0010 | < 0.010 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0013 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 1.2 | 12 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.16 | 1.6 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 8.1 | 81 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 100 | 1000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 12 | 120 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 4.6 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462854 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP2-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 3.2 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 7.5 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.8 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | < 0.0020 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0026 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.052 | 0.52 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.024 | 0.24 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.010 | 0.10 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.013 | 0.13 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0050 | 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | 0.0032 | 0.032 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0027 | 0.027 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0011 | 0.011 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0082 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 6.7 | 67 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.18 | 1.8 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 200 | 2000 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 340 | 3400 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 26 | 260 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 19 |



**Waste Acceptance Criteria**

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462855 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP27-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 0.88 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.1 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.5 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.018 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0084 | 0.084 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.013 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.0012 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.013 | 0.13 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.011 | 0.11 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0045 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | 0.0014 | 0.014 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0023 | 0.023 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0020 | 0.020 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0031 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 4.5 | 45 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.68 | 6.8 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 16 | 160 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 81 | 810 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 21 | 210 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 13 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462856 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP25-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.1 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.8 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 59 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.4 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | < 0.0020 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0046 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.0099 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.012 | 0.12 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0087 | 0.087 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0030 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | 0.0016 | 0.016 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0022 | 0.022 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0018 | 0.018 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0020 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 3.7 | 37 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.77 | 7.7 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 9.3 | 93 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 73 | 730 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 15 | 150 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 15 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Chemtest
The right chemistry to deliver results

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462857 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP28-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 2.1 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 6.2 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 160 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | 6.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.2 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.012 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0018 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.029 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.0017 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0055 | 0.055 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0074 | 0.074 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0027 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0027 | 0.027 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0011 | 0.011 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0028 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.8 | 28 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.33 | 3.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 26 | 260 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 130 | 1300 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 13 | 130 | 500 | 800 | 1000 |



| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 17 |

**Waste Acceptance Criteria**

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462858 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP29-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.6 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 4.6 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.5 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.013 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0044 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.013 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0097 | 0.097 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0066 | 0.066 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0029 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | 0.0022 | 0.022 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0040 | 0.040 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0016 | 0.016 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0021 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 3.8 | 38 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.67 | 6.7 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 11 | 110 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 86 | 860 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 17 | 170 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 17 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Chemtest Sample ID:** | 462859 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP31-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | |
| Total Organic Carbon | 2625 | U | % | 1.1 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 2.9 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 300 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.031 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0023 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.010 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0034 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0059 | 0.059 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | < 0.0010 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | < 0.0010 | < 0.010 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | < 0.0010 | < 0.010 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | < 0.0010 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.0 | 20 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.61 | 6.1 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 10 | 100 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 95 | 950 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 16 | 160 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 10 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462860 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP18-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.3 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 4.4 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 180 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.2 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.032 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.035 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0057 | 0.057 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0061 | 0.061 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0015 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0021 | 0.021 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | < 0.0010 | < 0.010 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0031 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.8 | 28 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.23 | 2.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 63 | 630 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 180 | 1800 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 16 | 160 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 12 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462861 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP23-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 02-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 2.6 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 6.6 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 270 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.9 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.028 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0021 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.044 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0048 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.016 | 0.16 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0021 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0065 | 0.065 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | < 0.0010 | < 0.010 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0036 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 5.0 | 50 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.20 | 2.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 65 | 650 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 200 | 2000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 19 | 190 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 14 |



**Waste Acceptance Criteria**

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries Edgeworthstown**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-14011 | | | | | | |
| **Chemtest Sample ID:** | 462937 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP33-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 01-Jun-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 2.7 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 6.9 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.5 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.050 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0011 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.0049 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0022 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0018 | < 0.050 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | < 0.0010 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | < 0.0010 | < 0.010 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | < 0.0010 | < 0.010 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0012 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.3 | 23 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.36 | 3.6 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 20 | 200 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 63 | 630 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 12 | 120 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 13 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1450 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2015 | Acid Neutralisation Capacity | Acid Reserve | Titration |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2610 | Loss on Ignition | loss on ignition (LOI) | Determination of the proportion by mass that is lost from a soil by ignition at 550°C. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2790 | Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS | Semi-volatile organic compounds(cf. USEPA Method 8270) | Acetone/Hexane extraction / GC-MS |

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2815 | Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS | ICES7 PCB congeners | Acetone/Hexane extraction / GC-MS |

## Report Information

### Key

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1



### Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample

### Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

UKAS TESTING
2183

# Final Report

| | |
|---|---|
| **Report No.:** | 17-17284-1 |
| **Initial Date of Issue:** | 12-Jul-2017 |
| **Client** | MULROY ENVIRONMENTAL |
| **Client Address:** | 30 Lisroland View<br>Knockbridge<br>Dundalk<br>County Louth<br>Ireland |
| **Contact(s):** | Padriac Mulroy<br>Patrick McCabe |
| **Project** | Skerries |

| | | | |
|---|---|---|---|
| **Quotation No.:** | Q17-09135 | **Date Received:** | 05-Jul-2017 |
| **Order No.:** | | **Date Instructed:** | 05-Jul-2017 |
| **No. of Samples:** | 3 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 11-Jul-2017 |
| **Date Approved:** | 12-Jul-2017 | | |



**Approved By:**

**Details:** Glynn Harvey, Laboratory Manager

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# Results - Soil

**Project: Skerries**

| Client: MULROY ENVIRONMENTAL | | | | | | | |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | | | Chemtest Job No.: | 17-17284 | 17-17284 | 17-17284 |
| | | | | Chemtest Sample ID.: | 479809 | 479810 | 479811 |
| | | | | Client Sample ID.: | SO-TP36-01 | SO-TP37-01 | SO-TP38-01 |
| | | | | Sample Type: | SOIL | SOIL | SOIL |
| | | | | Date Sampled: | 04-Jul-2017 | 04-Jul-2017 | 04-Jul-2017 |
| | | | | Asbestos Lab: | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| ACM Type | U | 2192 | | N/A | - | - | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 17 | 21 | 15 |
| Dry Matter | N | | % | N/A | 83 | 79 | 85 |
| Sulphate (Total) | U | 2430 | mg/kg | 100 | 16000 | 1600 | 3400 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 22 | 21 | 22 |
| Barium | U | 2450 | mg/kg | 10 | 120 | 160 | 210 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 0.73 | 1.7 | 1.4 |
| Chromium | U | 2450 | mg/kg | 1.0 | 26 | 26 | 41 |
| Copper | U | 2450 | mg/kg | 0.50 | 47 | 48 | 97 |
| Mercury | U | 2450 | mg/kg | 0.10 | 0.71 | 0.24 | 0.44 |
| Molybdenum | U | 2450 | mg/kg | 2.0 | 2.1 | 2.7 | 3.1 |
| Nickel | U | 2450 | mg/kg | 0.50 | 47 | 40 | 53 |
| Lead | U | 2450 | mg/kg | 0.50 | 45 | 74 | 140 |
| Antimony | N | 2450 | mg/kg | 2.0 | 2.5 | 2.7 | 3.9 |
| Selenium | U | 2450 | mg/kg | 0.20 | 0.70 | 0.73 | 0.93 |
| Zinc | U | 2450 | mg/kg | 0.50 | 110 | 210 | 500 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 5.0 | 26 | 26 | 41 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Total Organic Carbon | U | 2625 | % | 0.20 | 1.2 | 4.2 | 2.8 |
| Mineral Oil | N | 2670 | mg/kg | 10 | < 10 | < 10 | < 10 |
| TPH >C6-C10 | N | 2670 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH >C10-C21 | N | 2670 | mg/kg | 1.0 | < 1.0 | 21 | < 1.0 |
| TPH >C21-C40 | N | 2670 | mg/kg | 1.0 | < 1.0 | 46 | < 1.0 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | < 10 | 66 | < 10 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |

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# Results - Soil

**Project: Skerries**

| **Client: MULROY ENVIRONMENTAL** | | **Chemtest Job No.:** | | | 17-17284 | 17-17284 | 17-17284 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q17-09135 | | **Chemtest Sample ID.:** | | | 479809 | 479810 | 479811 |
| | | Client Sample ID.: | | | SO-TP36-01 | SO-TP37-01 | SO-TP38-01 |
| | | Sample Type: | | | SOIL | SOIL | SOIL |
| | | Date Sampled: | | | 04-Jul-2017 | 04-Jul-2017 | 04-Jul-2017 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Aromatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | 5.1 | 3.3 |
| Aromatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | 23 | 7.6 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | 3.9 | < 1.0 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | 32 | 11 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | < 10 | 32 | 11 |
| Benzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | 0.34 | < 0.10 |
| Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | 0.25 | < 0.10 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Coronene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 | < 2.0 |

# Results - Single Stage WAC

**Project: Skerries**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-17284 | | | | | | |
| **Chemtest Sample ID:** | 479809 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP36-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 04-Jul-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.2 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.3 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.2 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.34 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0010 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.11 | 1.1 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0030 | < 0.050 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0089 | 0.089 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0018 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0016 | 0.016 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | < 0.0010 | < 0.010 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0089 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.0 | 20 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.61 | 6.1 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 120 | 1200 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 360 | 3600 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 8.3 | 83 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 17 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-17284 | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Chemtest Sample ID:** | 479810 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP37-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 04-Jul-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | |
| Total Organic Carbon | 2625 | U | % | 4.2 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 4.1 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | 66 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.8 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.031 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0053 | 0.053 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.084 | 0.84 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.00014 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.0097 | 0.097 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.013 | 0.13 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.029 | 0.29 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.012 | 0.12 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.011 | 0.11 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0019 | 0.019 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0096 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.9 | 29 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.37 | 3.7 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 44 | 440 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 200 | 2000 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 14 | 140 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 21 |



**Waste Acceptance Criteria**

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Skerries**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 17-17284 | | | | | | |
| **Chemtest Sample ID:** | 479811 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TP38-01 | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 04-Jul-2017 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 2.8 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 8.2 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 7.7 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.023 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0013 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.075 | 0.75 | 20 | 100 | 300 |
| Cadmium | 1450 | U | 0.00014 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | 0.0024 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.061 | 0.61 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0073 | 0.073 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.016 | 0.16 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | 0.0032 | 0.032 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | < 0.0010 | < 0.010 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.029 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 15 | 150 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.16 | 1.6 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 430 | 4300 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 660 | 6600 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 23 | 230 | 500 | 800 | 1000 |

| **Soild Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 15 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1450 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2015 | Acid Neutralisation Capacity | Acid Reserve | Titration |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2610 | Loss on Ignition | loss on ignition (LOI) | Determination of the proportion by mass that is lost from a soil by ignition at 550°C. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2815 | Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS | ICES7 PCB congeners | Acetone/Hexane extraction / GC-MS |

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# Report Information

## Key

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1



## Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample

## Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

Chemtest
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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

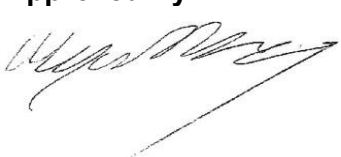
# Final Report

| | |
|---|---|
| **Report No.:** | 18-37092-1 |
| **Initial Date of Issue:** | 05-Dec-2018 |
| **Client** | MULROY ENVIRONMENTAL |
| **Client Address:** | 30 Lisroland View<br>Knockbridge<br>Dundalk<br>County Louth<br>Ireland |
| **Contact(s):** | Andrena Meegan<br>Padriac Mulroy |
| **Project** | Winsac |

| | | | |
|---|---|---|---|
| **Quotation No.:** | Q17-08492 | **Date Received:** | 26-Nov-2018 |
| **Order No.:** | | **Date Instructed:** | 28-Nov-2018 |
| **No. of Samples:** | 2 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 04-Dec-2018 |
| **Date Approved:** | 05-Dec-2018 | | |



**Approved By:**



**Details:** Glynn Harvey, Laboratory Manager

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# Results - Soil

**Project: Winsac**

| **Client: MULROY ENVIRONMENTAL** | | **Chemtest Job No.:** | | | 18-37092 | 18-37092 |
|---|---|---|---|---|---|---|
| Quotation No.: Q17-08492 | | **Chemtest Sample ID.:** | | | 730893 | 730894 |
| | | Client Sample ID.: | | | SO-TS1-01 | SO-TS2-01 |
| | | Sample Type: | | | SOIL | SOIL |
| | | Date Sampled: | | | 22-Nov-2018 | 22-Nov-2018 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| ACM Type | U | 2192 | | N/A | - | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 15 | 13 |
| Dry Matter | N | | % | N/A | 85 | 87 |
| Sulphate (Total) | U | 2430 | mg/kg | 100 | 550 | 590 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 18 | 19 |
| Barium | U | 2450 | mg/kg | 10 | 110 | 66 |
| Cadmium | U | 2450 | mg/kg | 0.10 | 0.72 | 0.68 |
| Chromium | U | 2450 | mg/kg | 1.0 | 30 | 25 |
| Molybdenum | U | 2450 | mg/kg | 2.0 | < 2.0 | 2.0 |
| Antimony | N | 2450 | mg/kg | 2.0 | < 2.0 | < 2.0 |
| Copper | U | 2450 | mg/kg | 0.50 | 29 | 20 |
| Mercury | U | 2450 | mg/kg | 0.10 | 0.11 | < 0.10 |
| Nickel | U | 2450 | mg/kg | 0.50 | 37 | 34 |
| Lead | U | 2450 | mg/kg | 0.50 | 40 | 21 |
| Selenium | U | 2450 | mg/kg | 0.20 | 0.36 | 0.42 |
| Zinc | U | 2450 | mg/kg | 0.50 | 94 | 50 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 1.0 | 30 | 25 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Total Organic Carbon | U | 2625 | % | 0.20 | 1.4 | 1.0 |
| Mineral Oil | N | 2670 | mg/kg | 10 | < 10 | < 10 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C8-C10 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C10-C12 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C12-C16 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C16-C21 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C21-C35 | U | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | < 5.0 | < 5.0 |

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# Results - Soil

**Project: Winsac**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | | | 18-37092 | 18-37092 |
|---|---|---|---|---|---|---|
| Quotation No.: Q17-08492 | | Chemtest Sample ID.: | | | 730893 | 730894 |
| | | Client Sample ID.: | | | SO-TS1-01 | SO-TS2-01 |
| | | Sample Type: | | | SOIL | SOIL |
| | | Date Sampled: | | | 22-Nov-2018 | 22-Nov-2018 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | < 10 | < 10 |
| Dichlorodifluoromethane | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Chloromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Vinyl Chloride | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Bromomethane | U | 2760 | µg/kg | 20 | < 20 | < 20 |
| Chloroethane | N | 2760 | µg/kg | 2.0 | < 2.0 | < 2.0 |
| Trichlorofluoromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Trans 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| cis 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Bromochloromethane | N | 2760 | µg/kg | 5.0 | < 5.0 | < 5.0 |
| Trichloromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,1,1-Trichloroethane | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Tetrachloromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloropropene | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Benzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | U | 2760 | µg/kg | 2.0 | < 2.0 | < 2.0 |
| Trichloroethene | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Dibromomethane | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Bromodichloromethane | U | 2760 | µg/kg | 5.0 | < 5.0 | < 5.0 |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | < 10 | < 10 |
| Toluene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | < 10 | < 10 |
| 1,1,2-Trichloroethane | U | 2760 | µg/kg | 10 | < 10 | < 10 |
| Tetrachloroethene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichloropropane | N | 2760 | µg/kg | 2.0 | < 2.0 | < 2.0 |
| Dibromochloromethane | N | 2760 | µg/kg | 10 | < 10 | < 10 |
| 1,2-Dibromoethane | U | 2760 | µg/kg | 5.0 | < 5.0 | < 5.0 |
| Chlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,1,1,2-Tetrachloroethane | U | 2760 | µg/kg | 2.0 | < 2.0 | < 2.0 |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Styrene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Tribromomethane | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Isopropylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Bromobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | < 50 | < 50 |

Chemtest
The right chemistry to deliver results

# Results - Soil

**Project: Winsac**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | | | 18-37092 | 18-37092 |
|---|---|---|---|---|---|---|
| Quotation No.: Q17-08492 | | Chemtest Sample ID.: | | | 730893 | 730894 |
| | | | Client Sample ID.: | | SO-TS1-01 | SO-TS2-01 |
| | | | Sample Type: | | SOIL | SOIL |
| | | | Date Sampled: | | 22-Nov-2018 | 22-Nov-2018 |
| | | | Asbestos Lab: | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| N-Propylbenzene | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 2-Chlorotoluene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,3,5-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 4-Chlorotoluene | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Tert-Butylbenzene | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,2,4-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Sec-Butylbenzene | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 4-Isopropyltoluene | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,4-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| N-Butylbenzene | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,2-Dibromo-3-Chloropropane | N | 2760 | µg/kg | 50 | < 50 | < 50 |
| 1,2,4-Trichlorobenzene | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| Hexachlorobutadiene | N | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| 1,2,3-Trichlorobenzene | N | 2760 | µg/kg | 2.0 | < 2.0 | < 2.0 |
| Methyl Tert-Butyl Ether | U | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 |
| N-Nitrosodimethylamine | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Phenol | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2-Chlorophenol | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Bis-(2-Chloroethyl)Ether | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 1,3-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 1,2-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2-Methylphenol | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Bis(2-Chloroisopropyl)Ether | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| N-Nitrosodi-n-propylamine | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 4-Methylphenol | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Nitrobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Isophorone | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Bis(2-Chloroethoxy)Methane | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2,4-Dichlorophenol | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 1,2,4-Trichlorobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Naphthalene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Hexachlorobutadiene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 4-Chloro-3-Methylphenol | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |

Chemtest
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# Results - Soil

**Project: Winsac**

| Client: MULROY ENVIRONMENTAL | | Chemtest Job No.: | | | 18-37092 | 18-37092 |
|---|---|---|---|---|---|---|
| Quotation No.: Q17-08492 | | Chemtest Sample ID.: | | | 730893 | 730894 |
| | | Client Sample ID.: | | | SO-TS1-01 | SO-TS2-01 |
| | | Sample Type: | | | SOIL | SOIL |
| | | Date Sampled: | | | 22-Nov-2018 | 22-Nov-2018 |
| | | Asbestos Lab: | | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| 2-Methylnaphthalene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2,4,6-Trichlorophenol | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2,4,5-Trichlorophenol | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2-Chloronaphthalene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2-Nitroaniline | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Acenaphthylene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Dimethylphthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2,6-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Acenaphthene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Dibenzofuran | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 4-Chlorophenylphenylether | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2,4-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Fluorene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Diethyl Phthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 4-Nitroaniline | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Azobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| 4-Bromophenylphenyl Ether | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Hexachlorobenzene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Phenanthrene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Anthracene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Carbazole | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Di-N-Butyl Phthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Fluoranthene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Pyrene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Butylbenzyl Phthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Benzo[a]anthracene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Chrysene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Di-N-Octyl Phthalate | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Benzo[b]fluoranthene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Benzo[k]fluoranthene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Benzo[a]pyrene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Indeno(1,2,3-c,d)Pyrene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Dibenz(a,h)Anthracene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Benzo[g,h,i]perylene | U | 2790 | mg/kg | 0.50 | < 0.50 | < 0.50 |

Chemtest
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# Results - Soil

**Project: Winsac**

| Client: MULROY ENVIRONMENTAL | | | | | | |
|---|---|---|---|---|---|---|
| Quotation No.: Q17-08492 | | | | Chemtest Job No.: | 18-37092 | 18-37092 |
| | | | | Chemtest Sample ID.: | 730893 | 730894 |
| | | | | Client Sample ID.: | SO-TS1-01 | SO-TS2-01 |
| | | | | Sample Type: | SOIL | SOIL |
| | | | | Date Sampled: | 22-Nov-2018 | 22-Nov-2018 |
| | | | | Asbestos Lab: | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| Naphthalene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Chrysene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Coronene | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 |
| PCB 28 | U | 2815 | mg/kg | 0.010 | < 0.010 | < 0.010 |
| PCB 52 | U | 2815 | mg/kg | 0.010 | < 0.010 | < 0.010 |
| PCB 90+101 | U | 2815 | mg/kg | 0.010 | < 0.010 | < 0.010 |
| PCB 118 | U | 2815 | mg/kg | 0.010 | < 0.010 | < 0.010 |
| PCB 153 | U | 2815 | mg/kg | 0.010 | < 0.010 | < 0.010 |
| PCB 138 | U | 2815 | mg/kg | 0.010 | < 0.010 | < 0.010 |
| PCB 180 | U | 2815 | mg/kg | 0.010 | < 0.010 | < 0.010 |
| Total PCBs (7 Congeners) | N | 2815 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Demeton-O | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Phorate | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Demeton-S | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Disulfoton | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Fenthion | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Trichloronate | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Prothiofos | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Fensulphothion | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Sulprofos | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Azinphos-Methyl | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Coumaphos | N | 2820 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Atraton | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Prometon | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Simazine | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |

Chemtest
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# Results - Soil

**Project: Winsac**

| **Client: MULROY ENVIRONMENTAL** | | **Chemtest Job No.:** | | | 18-37092 | 18-37092 |
|---|---|---|---|---|---|---|
| Quotation No.: Q17-08492 | | **Chemtest Sample ID.:** | | | 730893 | 730894 |
| | | | | Client Sample ID.: | SO-TS1-01 | SO-TS2-01 |
| | | | | Sample Type: | SOIL | SOIL |
| | | | | Date Sampled: | 22-Nov-2018 | 22-Nov-2018 |
| | | | | Asbestos Lab: | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| Atrazine | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Propazine | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Terbuthylazine | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Secbumeton | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Simetryn | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Ametryn | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Prometryn | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Terbutryn | N | 2830 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Alpha-HCH | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Gamma-HCH (Lindane) | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Beta-HCH | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Delta-HCH | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Heptachlor | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Aldrin | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Heptachlor Epoxide | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Gamma-Chlordane | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Alpha-Chlordane | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Endosulfan I | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| 4,4-DDE | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Dieldrin | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Endrin | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| 4,4-DDD | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Endosulfan II | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Endrin Aldehyde | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| 4,4-DDT | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Endosulfan Sulphate | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Methoxychlor | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Endrin Ketone | N | 2840 | mg/kg | 0.20 | < 0.20 | < 0.20 |

Chemtest
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# Results - Single Stage WAC

**Project: Winsac**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 18-37092 | | | | | | |
| **Chemtest Sample ID:** | 730893 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TS1-01 | | | | | | |
| **Sample Location:** | | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 22-Nov-2018 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.4 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 4.1 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.029 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.0020 | < 0.050 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.032 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.0055 | 0.055 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0032 | < 0.050 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0011 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | < 0.0010 | < 0.010 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0015 | 0.015 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.0011 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 21 | 210 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.50 | 5.0 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 28 | 280 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 190 | 1900 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 11 | 110 | 500 | 800 | 1000 |



| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 15 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: Winsac**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 18-37092 | | | | | | |
| **Chemtest Sample ID:** | 730894 | | | | | | |
| **Sample Ref:** | | | | | | | |
| **Sample ID:** | SO-TS2-01 | | | | | | |
| **Sample Location:** | | | | | | | |
| **Top Depth(m):** | | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | 22-Nov-2018 | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | 1.0 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.6 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | U | mg/kg | < 0.10 | 1 | -- | -- |
| TPH Total WAC (Mineral Oil) | 2670 | U | mg/kg | < 10 | 500 | -- | -- |
| Total (Of 17) PAH's | 2800 | N | mg/kg | < 2.0 | 100 | -- | -- |
| pH | 2010 | U | | 8.1 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.034 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1450 | U | 0.012 | 0.12 | 0.5 | 2 | 25 |
| Barium | 1450 | U | 0.011 | < 0.50 | 20 | 100 | 300 |
| Cadmium | 1450 | U | < 0.00010 | < 0.010 | 0.04 | 1 | 5 |
| Chromium | 1450 | U | < 0.0010 | < 0.050 | 0.5 | 10 | 70 |
| Copper | 1450 | U | 0.022 | 0.22 | 2 | 50 | 100 |
| Mercury | 1450 | U | < 0.00050 | < 0.0050 | 0.01 | 0.2 | 2 |
| Molybdenum | 1450 | U | 0.0076 | 0.076 | 0.5 | 10 | 30 |
| Nickel | 1450 | U | 0.0028 | < 0.050 | 0.4 | 10 | 40 |
| Lead | 1450 | U | < 0.0010 | < 0.010 | 0.5 | 10 | 50 |
| Antimony | 1450 | U | < 0.0010 | < 0.010 | 0.06 | 0.7 | 5 |
| Selenium | 1450 | U | 0.0010 | 0.010 | 0.1 | 0.5 | 7 |
| Zinc | 1450 | U | 0.013 | < 0.50 | 4 | 50 | 200 |
| Chloride | 1220 | U | 8.7 | 87 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.69 | 6.9 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 6.0 | 60 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 140 | 1400 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 10 | 100 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 13 |



## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1450 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2015 | Acid Neutralisation Capacity | Acid Reserve | Titration |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2610 | Loss on Ignition | loss on ignition (LOI) | Determination of the proportion by mass that is lost from a soil by ignition at 550°C. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2790 | Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS | Semi-volatile organic compounds(cf. USEPA Method 8270) | Acetone/Hexane extraction / GC-MS |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2815 | Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS | ICES7 PCB congeners | Acetone/Hexane extraction / GC-MS |
| 2820 | Organophosphorus (O-P) Pesticides in Soils by GC-MS | Organophosphorus pesticide representative suite including Parathion, Malathion etc, plus client specific determinands | Dichloromethane extraction / GC-MS |
| 2830 | Organonitrogen (O-N) Pesticides in Soils by GC-MS | Organonitrogen pesticide representative suite including Triazines etc, plus client specific determinands | Dichloromethane extraction / GC-MS |
| 2840 | Organochlorine (O-Cl) Pesticides in Soils by GC-MS | Organochlorine pesticide representative suite including DDT and its metabolites, 'drins' and HCH etc, plus client specific determinands | Dichloromethane extraction / GC-MS |
| 640 | Characterisation of Waste (Leaching) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

Chemtest
The right chemistry to deliver results

## Report Information

### Key

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1



### Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

### Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

## ANALYSIS REPORT

| | | | |
|---|---|---|---|
| **CUSTOMER:** | **MULROY ENVIRONMENTAL** | **SAMPLE TYPE:** | **SOIL** |
| **ADDRESS:** | 30 Lisroland Knockbridge<br>Dundalk<br>Co Louth | **CONDITION OF SAMPLE ON RECEIPT:** | Satisfactory |
| | | **DATE SAMPLED:** | 25 April 2018 – 03 May 2018 & 17 May 2018 |
| **REPORT TO:** | **PATRICK MULROY & PATRICK MCCABE** | **DATE RECEIVED:** | 22 May 2018 |
| **SAMPLED BY:** | Dylan Potter | **DATE ANALYSED:** | 01 – 28 June 2018 |
| **SAMPLING PT:** | **Skerries Co Dublin** | **DATE REPORTED:** | 09 July 2018 |
| | | **REISSUE DATE:** | 24 July 2018 |
| **ORDER NO:** | ~ | **WORK NO.:** | **40683 C** |

Dr Conor Murphy
**Operations Manager**

**Index to symbols used**

| | |
|---|---|
| (F) | Analysis carried out at our Farranfore Laboratory. |
| dw | Dry weight |

- **The results relate only to the items tested.**
- **Opinions and interpretations expressed herein are outside the scope of INAB accreditation.**
- **The analysis report shall not be reproduced except in full without written approval of the laboratory**

**TABLE OF RESULTS**

| Method: | Parameter: | Unit | C18 May 559 | C18 May 560 | C18 May 561 | C18 May 562 | C18 May 563 | C18 May 564 | C18 May 565 |
|---|---|---|---|---|---|---|---|---|---|
| | | | **SO-GV1-01** | **SO-GV1-02** | **SO-GV2-01** | **SO-GV2-02** | **SO-GV3-01** | **SO-GV3-02** | **SO-GV4-01** |
| | **Chemical Analysis: (F)** | | | | | | | | |
| | Kjeldahl Nitrogen | mg/kg dw | 1833 | 2037 | 5933 | 1233 | 2431 | 2890 | 2461 |
| $BaCl_2$ Method | Cation Exchange Capacity | mEqv/100g | 8.04 | 9.19 | 11.21 | 7.76 | 9.22 | 9.23 | 8.23 |
| | Total Organic Matter | % | 0.9 | 2.5 | 3.8 | 0.8 | 2.9 | 1.9 | 4.5 |
| | Nitrate | mg/kg $NO_3$-N dw | 75.4 | <2.5 | 3.2 | <2.5 | <2.5 | <2.5 | 2.7 |
| | Nitrite | mg/kg $NO_2$-N dw | 0.21 | 0.17 | 0.30 | 0.31 | 0.50 | 0.34 | 0.69 |
| | Chloride | mg/kg dw | 23.2 | 72.2 | 83.3 | 87.7 | 171.8 | 214.5 | 420.4 |
| | Sulphate | mg/kg dw | <3 | <3 | 13.7 | 343 | 480 | 2257 | 3245 |
| | Sodium | mg/kg dw | 80 | <20 | 100 | 35 | 44 | 99 | 217 |
| | Sodium | mEqv/100g | 0.35 | <0.1 | 0.44 | 0.15 | 0.19 | 0.43 | 0.94 |
| | Potassium | mg/kg dw | 172 | 245 | 385 | 295 | 219 | 682 | 633 |
| | Potassium | mEqv/100g | 0.44 | 0.63 | 0.99 | 0.76 | 0.56 | 1.75 | 1.62 |
| | Magnesium | mg/kg dw | 82 | 283 | 334 | 141 | 220 | 257 | 620 |
| | Magnesium | mEqv/100g | 0.69 | 2.36 | 2.79 | 1.18 | 1.84 | 2.15 | 5.2 |
| | Calcium | mg/kg dw | 1819 | 2484 | 2745 | 1702 | 2440 | 2314 | 2743 |
| | Calcium | mEqv/100g | 9.1 | 12.4 | 13.7 | 8.50 | 12.2 | 11.5 | 13.7 |
| | Exchangeable Cations | mEqv/100g | 10.6 | 15.42 | 17.94 | 10.6 | 14.8 | 15.9 | 21.5 |
| | Ammonium Leached | mg/kg dw | 10.4 | 24.1 | 36.3 | 16.4 | 54.2 | 70.8 | 84.8 |

**TABLE OF RESULTS**

| Method: | Parameter: | Unit | C18 May 566 **SO-GV4-02** | C18 May 567 **SO-GV5-01** | C18 May 568 **SO-GV5-02** | C18 May 569 **SO-GV15-01** | C18 May 570 **SO-GV16-01** | C18 May 571 **SO-GV17-01** |
|---|---|---|---|---|---|---|---|---|
| | **Chemical Analysis: (F)** | | | | | | | |
| | Kjeldahl Nitrogen | % | 2598 | 2201 | 2691 | 1059 | 900 | 2314 |
| $BaCl_2$ Method | Cation Exchange Capacity | mEqv/100g | 7.20 | 10.70 | 7.71 | 6.31 | 10.20 | 9.20 |
| | Total Organic Matter | % | 3.1 | 3.7 | 4.9 | 0.2 | 0.4 | 1.2 |
| | Nitrate | mg/kg $NO_3$-N dw | 33.2 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 |
| | Nitrite | mg/kg $NO_2$-N dw | 0.35 | 0.18 | 0.28 | 0.33 | 0.27 | 0.28 |
| | Chloride | mg/kg dw | 162.0 | 356.9 | 13.1 | 14.4 | 42.8 | 521.2 |
| | Sulphate | mg/kg dw | 4348 | 566 | 4505 | 344 | <3 | 10.4 |
| | Sodium | mg/kg dw | 325 | 100 | 310 | 90 | 44 | 11 |
| | Sodium | mEqv/100g | 1.4 | 0.44 | 1.35 | 0.39 | 0.19 | 0.05 |
| | Potassium | mg/kg dw | 741 | 393 | 720 | 83 | 63 | 176 |
| | Potassium | mEqv/100g | 1.90 | 1.01 | 1.85 | 0.21 | 0.16 | 0.45 |
| | Magnesium | mg/kg dw | 712 | 354 | 587 | 103 | 109 | 117 |
| | Magnesium | mEqv/100g | 5.9 | 3.0 | 4.9 | 0.86 | 0.91 | 0.98 |
| | Calcium | mg/kg dw | 2595 | 2495 | 3088 | 1593 | 1759 | 2624 |
| | Calcium | mEqv/100g | 12.9 | 12.5 | 15.4 | 7.97 | 8.8 | 13.1 |
| | Exchangeable Cations | mEqv/100g | 22.2 | 16.9 | 23.5 | 9.43 | 10.1 | 14.6 |
| | Ammonium Leached | mg/kg dw | 73.1 | 123 | 49.4 | 7.22 | 4.42 | 22.8 |

## ANALYSIS REPORT

| | | | |
|---|---|---|---|
| **CUSTOMER:** | **MULROY ENVIRONMENTAL** | **SAMPLE TYPE:** | **SOIL** |
| **ADDRESS:** | 30 Lisroland Knockbridge<br>Dundalk, County Louth | **CONDITION OF SAMPLE ON RECEIPT:** | Satisfactory |
| | | **DATE SAMPLED:** | 01 June 2018 |
| **REPORT TO:** | **PATRICK MULROY & PATRICK MCCABE** | **DATE RECEIVED:** | 06 June 2018 |
| **SAMPLED BY:** | Patrick Mc Cabe | **DATE ANALYSED:** | 07 June – 01 July 2018 |
| **SAMPLING PT:** | **SKERRIES CO DUBLIN** | **DATE REPORTED:** | 25 July 2018 |
| **ORDER NO:** | ~ | **WORK NO.:** | **40811 C** |

### TABLE OF RESULTS

| Method: | Parameter: | Unit | C18-Jun 065 **SO-TP49-01** | C18-Jun 066 **SO-TP50-01** |
|---|---|---|---|---|
| | **Chemical Analysis: (F)** | | | |
| | Kjeldahl Nitrogen | mg/kg dw | 849 | 411 |
| | Nitrate | mg/kg $NO_3$-N dw | 5.0 | 42 |
| | Nitrite | mg/kg $NO_2$-N dw | 1.10 | 2.2 |
| | Chloride | mg/kg dw | 37 | 84 |
| | Sulphate | mg/kg dw | 18.0 | 40.6 |
| | Moisture Content | % | 12.7 | 35.1 |
| | Total Organic Matter | % dw | 1.1 | 0.8 |
| $BaCl_2$ Method | Cation Exchange Capacity | mEqv/100g | 9.98 | 14.5 |
| | Exchangeable Cations | mEqv/100g | 16.5 | 22 |
| | Sodium | mg/kg dw | 508 | 745 |
| | Potassium | mg/kg dw | 155 | 623 |
| | Magnesium | mg/kg dw | 219 | 249 |
| | Calcium | mg/kg dw | 2435 | 3027 |
| | Leached Ammonia | mg/kg dw | 9.9 | 4.5 |



Ruth Murphy
**Chemistry Laboratory Manager**

**Index to symbols used:**

| | |
|---|---|
| (F) | Analysis carried out at our Farranfore Laboratory. |
| dw | Dry weight |

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