

INDAVER IRELAND Ltd.

Partial Boundary Realignment Audit (Soils), April 2021

Technical Report Prepared For

Indaver Ireland Ltd Operations Ltd

Tolka Quay Road,
Dublin Port,
Dublin 1

Technical Report Prepared By

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EXECUTIVE SUMMARY

AWN Consulting (AWN) were requested by Mr James Duffy of Indaver Ireland Ltd, (Indaver) to conduct an Independent Closure Audit of a small section of land to the south west of their current waste transfer and solvent recovery facility (SRF) AT Tolka Quay Road, Dublin 1 in order to surrender this section of the site for future road development to the south of the facility.

The EPA's Guidance on Requests for alterations to a Licensed Industrial or Waste Activity 2019 gives three Categories of Alterations for seeking approval for an alteration to a licensable activity and/ or installation, these are:

1. Where a change requires approval, but does not require a change in any conditions of a licence:
2. Where the screening process indicates that the alteration is likely to require a technical or clerical amendment (TA/CA) to the licence, and
3. Where the screening process indicates that the alteration is likely to require a licence review or a new application.

Condition 1 requests for approval and licence amendments will only cover minor alterations.

Due to the small area that is being requested and that there will be no change to the ongoing activities of the site (no need for any decommissioning etc) Condition 1 will apply here.

A desk-based audit and onsite shallow soil sampling was undertaken to establish a site-specific Conceptual Site Model to determine if the small parcel of land proposed for surrender posed an environmental risk to onsite or offsite receptors using the Source-Pathway-Receptor rationale. Soil samples analysis results were compared against the LQM (Land Quality Management) and the CIEH (Chartered Institute of Environmental Health) Suitable 4 Use Level (S4UL) Generic Assessment Criteria (GAC). The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently derived and cautious "trigger values" above which further assessment of the risks or remedial action may be needed, Soil sampling and analysis undertaken in March 2020 showed no residual contamination at the site

On the basis of assessment undertaken by AWN Consulting, AWN is satisfied that the proposed area of land to the south west of the Indaver site is suitable for removal from the current licence boundary in accordance with the EPA's Guidance to Licensees on Surrender, Cessation and Closure of Licenced Site 2012, namely.

- (i) *That the technical unit and any equipment or materials located on the site are not causing or likely to cause pollution.* There is no equipment or materials on site currently or in the past which could cause pollution.
- (ii) *That the site (including subsoil and groundwater) is in a satisfactory state.*

No apparent sources of pollution were recorded, and shallow soil sampling showed the underlying material to be relatively clean. There is no risk to onsite or offsite receptors.

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1.0 INTRODUCTION

AWN Consulting (AWN) were requested by Mr James Duffy of Indaver Ireland Ltd, (Indaver) to conduct an Independent Closure Audit of a small section of land to the south west of their current waste transfer and solvent recovery facility (SRF) at Tolka Quay Road, Dublin 1 in order to surrender this section of the site for future road development to the south of the facility. The Indaver site currently operates under Industrial Emissions Directive (herein referred to as IED) licence W0036-02.

AWN has prepared this Audit report on the basis of and taking into account;

- Assessment of all available historical environmental information provided by Indaver
- Site Investigation and soil sampling works carried out by AWN during in March 2021
- Guidance on Request for Alterations to a Licensed Industrial or Waste Facility. EPA 2019
- Guidance to Licensees on Surrender, Cessation and Closure of Licenced Site. EPA, 2012

The Indaver Facility is located in Dublin Port. The site location can be seen in Figure 1.1. Indaver are requesting a licence boundary change to exclude a small undeveloped section (circa 60 m²) of the site to the south west of the site Figure 1.2. It is proposed that this area will be taken into the ownership of the Dublin Port Company for the upgrading of the Tolka Quay Road. The wider Indaver facility site will continue to operate as current under IED Licence No. W0036-02.



Figure 1.1 Site Location

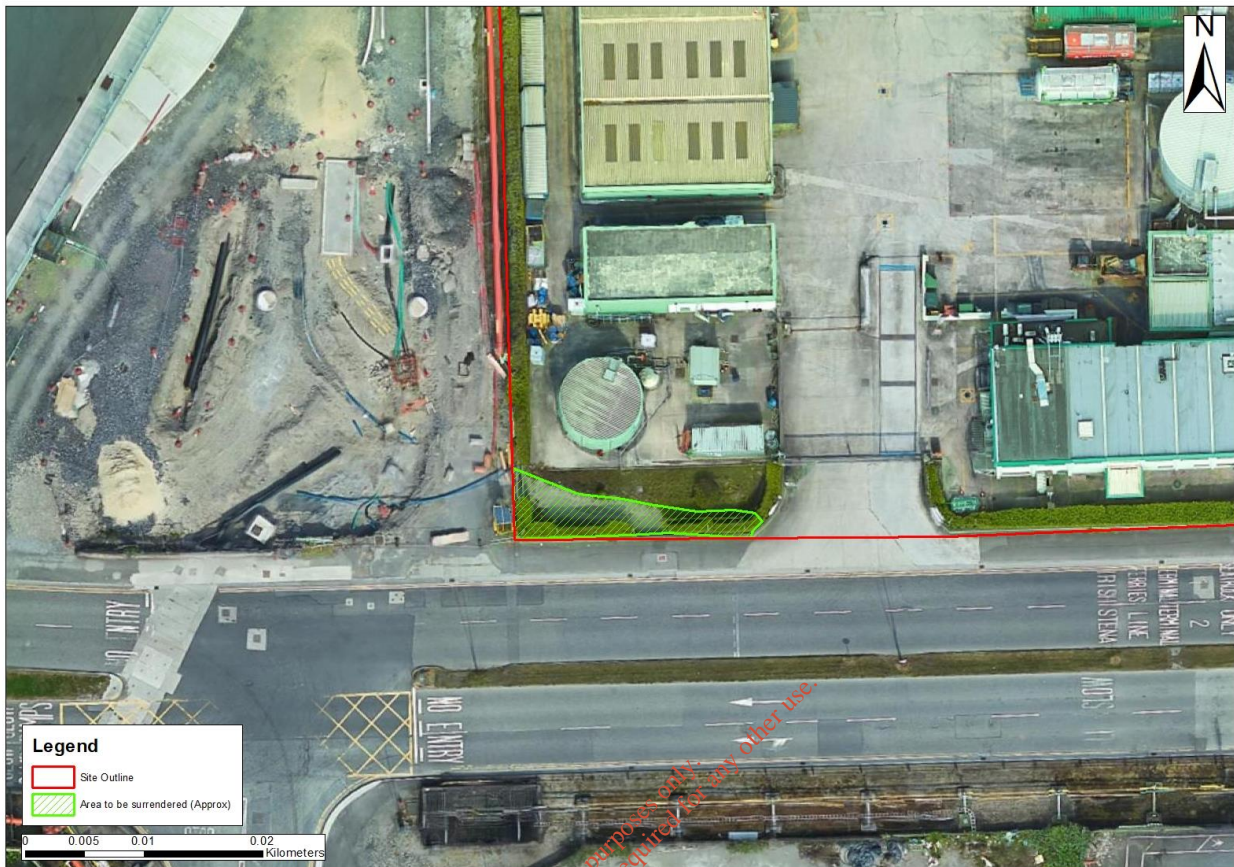


Figure 1.2 Area to be surrendered (green hatched area)

1.1 Scope of work

The EPA's Guidance on Requests for alterations to a Licensed Industrial or Waste Activity 2019 gives three Categories of Alterations for seeking approval for an alteration to a licensable activity and/ or installation, these are:

2. Where a change requires approval, but does not require a change in any conditions of a licence:
3. Where the screening process indicates that the alteration is likely to require a technical or clerical amendment (TA/CA) to the licence, and
4. Where the screening process indicates that the alteration is likely to require a licence review or a new application.

Condition 1 requests for approval and licence amendments will only cover minor alterations.

Due to the small area that is being requested and that there will be no change to the ongoing activities of the site (no need for any decommissioning etc) Condition 1 will apply here.

Furthermore, as per the Guidance to Licensees on Surrender, Cessation and Closure of Licenced Site (EPA, 2012), Section 95 of the Environmental Protection Act 1992 (as amended) and Section 48 of the Waste Management Management 1996 (as amended) enable the licensee to apply to surrender the licence. The surrender application is a process that requires the licensee to verify to the Agency:

“...that the condition of the relevant installation is not causing or likely to cause environmental pollution and the site of the activity is in a satisfactory state”

To meet the requirements of the guidance these following criteria have been assessed within this report:

- (i) That the technical unit and any equipment or materials located on the site are not causing or likely to cause pollution.
- (ii) That the site (including subsoil and groundwater) is in a satisfactory state.

2.0 CONTEXT

2.1 Land Use

The Indaver site is situated on the Tolka Quay Road in the North-East of Dublin Port (the Dublin Port Oil Zone). The site occupies an area of approximately 0.8 hectares and is bounded by a fire access road to the West and by Tolka Quay Road to the South. The site is located in an industrial area and is surrounded by tank farms and container storage sites. To the North and East of the site, there is an LPG storage and distribution facility operated by Calor Teoranta. To the West of the site, there is a fire access road beyond which there is a site occupied by the Dublin Port Company. Immediately to the West of that site, there is a tank farm for petroleum storage operated by Top Oil. Due South of the site, across Tolka Quay Road, there is a single tank installation formally used by Asahi Chemicals for storing chemical raw materials for use in their textiles processing plant at Baling. This tank has not been used for c. 19 years. Irish Shell operates a tank farm to the South-West of the site.

The Dublin Port area was reclaimed from estuarine/tidal deposits. This was part of enlargement schemes undertaken by the Dublin Port Company from the 1920s onwards. As such, the subsurface soils on the site consist of pumped fill comprising sandy gravel underlain by silt, sand and gravel (KD Environmental, 2021).

There are no current buildings/ tanks/ structures of any kind on the small section of the site that is being proposed to be surrendered. There are no subsurface utilities in the proposed area for surrender apart from a surface water sewer which will be maintained. Material storage and underground utility maps can be seen in Appendix 3.

2.2 Site History and Current Status

The Indaver facility is situated within a developed urban environment. However, North Dublin Bay is a listed SAC (Special Area of Conservation) – site code 00206 and South Dublin Bay & the River Tolka Estuary is a SPA (Special Protected Area) – site code 004024 which is located directly to the north of the wider Indaver site.

In July 2005, Indaver Ireland Limited, Tolka Quay Road, Dublin 1 was granted a Waste Management Licence by the Environmental Protection Agency (Registration No. W0036 -02) in respect of their operations. Prior to this, Indaver's operations on site were regulated by the previous Waste Management Licence (W0036-01) issued on February 1999. In January 2014, waste licence W0036-02 was amended to an Industrial Emissions Directive (herein referred to as IED) licence.

Aerial photography from 1995 (OSI, 2021) shows the plot where the current facility is located empty with possible hardcore fill material throughout. There has never been any development of the smaller parcel of land proposed to be surrendered.

3.0 PARTIAL SITE DECOMMISSIONING/ BOUNDARY CHANGE

As stated above it not proposed to modify/ change any element of the Indaver facility or the activities permitted by its current IE Licence.

All activities, storage, plant equipment, bunding etc will be unaffected by the proposed surrender of the small parcel of land to the south west (see Figure 1.2).

4.0 ASSESSMENT OF THE POTENTIAL FOR SOIL/GROUNDWATER CONTAMINATION

Representative soil sampling from the area to the south west of the site which is proposed to be surrendered was undertaken by AWN Consulting on 16th March 2021. The following section discusses the findings and aid in the development of a Conceptual Site Model (CSM) shown in Section 5.

4.1 Soil Quality Assessment

The sample locations (TP/S1, TP/S2 & TP/S3) can be viewed in Figure 4.1 below with trial pit logs of the excavation included in Appendix 1.



Figure 4.1 Soil sampling location (March 2021)

Shallow soil samples were recovered using hand tools with excavations extending to a maximum of 0.5 metres below ground level (mbgl). All samples were collected in line with BS 10175:2011+A2:2017 – Investigation of Potentially Contaminated Sites. Code of Practice and BS 5930 (1999) BS 5930:1999+A2:2010 – Code of practice for site investigations. All samples were sent to the UKAS accredited Element Environmental Laboratories, Deeside UK for analysis. All samples were analysed for metals, Polycyclic Aromatic Hydrocarbons (PAHs), Volatile Organic Compounds (VOCs), Semi Volatile Organic Compounds (sVOCs) and Polychlorinated Biphenyls (PCBs). The lab report can be viewed in Appendix 2.

The sample results are presented in the following tables and compared against Generic Assessment Criteria (GAC) There are no legislated threshold values for soils in Ireland. As such, the soil quality data was compared to a GAC derived to be protective of human health and also ecology for a residential and commercial/industrial end use.

Generic Assessment Criteria in the UK has been derived using the Contaminated Land Exposure Assessment (CLEA) model to be protective of human health for a number of different land uses. LQM (Land Quality Management) and the CIEH (Chartered Institute of Environmental Health) developed a document in July 2009 detailing their own research and derivation of their own 'LQM GACs'. A total of 82 substances including many organic substances had LQM GACs derived, for the standard land uses of residential, commercial/industrial and allotments. This was updated in 2015 following further research and the derived results are now called LQM/CIEH Suitable 4 Use Level (S4UL). The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently derived and cautious "trigger values" above which further assessment of the risks or remedial action may be needed. For each contaminant S4ULs have been derived for six land use scenarios based on assessing exposure pathways in each planning scenario. In this instance the commercial scenario has been considered. Soil type and soil organic matter (SOM) has an influence on the behaviour of contaminants. S4ULs have been derived for three SOM contents (1%, 2.5% and 6%) to cover the likely range in soils. A prudent approach has been taken by considering the lower 1% SOM content where applicable, metals criteria are by default listed by the LQM/CIEH as derived with 6% SOM.

The UK values do not have any legal standing within the Republic of Ireland and no statutory guidance for assessing the significance of soil contamination currently exists. However, the values do provide a means of placing the data within context when considering magnitude of risk and have been used in that capacity for this assessment. The main basis of the assessment remains the conceptual site model and consideration of the pollutant linkages: Source - Pathway – Receptor.

Metals

The majority of the recorded metal concentrations were below the most conservative threshold value for the LQM/CIEH for HHRA (Human Health Risk Assessment) Residential Threshold at 6% SOM. The one exception was arsenic which was above the threshold for future residential use (40 mg/kg) at 80 mg/kg. This is however considerably below the threshold for future commercial land use of 640 mg/kg and subsequently below the levels required for future industrial use.

| Table 4.1 Laboratory Test Results: SOIL Heavy Metals & General Suites | | | | | | | | |
|---|---------|------|--|---|------|------------|------------|------------|
| Client: Indaver Ireland | | | | | | | | |
| Location: Indaver Trasfer Sataion, Dublin Port | | | | | | | | |
| AWN Ref: Indaver Licence Boundary | | | | | | | | |
| Ref: 21/12185 | | | | | | | | |
| Sample ID | Details | | | | | SOIL | | |
| | | | | | | TP1/S1 | TP1/S2 | TP2/S3 |
| Depth (m) | | | | | | 0.25 | 0.3 | 0.35 |
| Laboratory | | | | | | EMT | EMT | EMT |
| Sample Type | | | | | | SOIL | SOIL | SOIL |
| Sample Date | | | | | | 16/03/2021 | 16/03/2021 | 16/03/2021 |
| Parameters | Units | MDL | LQM/CIEH S4ul for HHRA Residential Threshold at 6% SOM (mg/kg) | LQM/CIEH S4ul for HHRA Commercial Threshold at 6% SOM (mg/kg) | | | | |
| Arsenic | mg/kg | <0.5 | 40 | 640 | 80 | 7.4 | 6.6 | |
| Cadmium | mg/kg | <0.1 | 85 | 190 | <0.1 | 0.2 | 0.1 | |
| Chromium | mg/kg | <0.5 | 910 | 8600 | 82.7 | 54.5 | 61.4 | |
| Copper | mg/kg | <1 | 7100 | 68000 | 32 | 8 | 8 | |
| Lead | mg/kg | <5 | <i>nv</i> | <i>nv</i> | 22 | 16 | 9 | |
| Mercury | mg/kg | <0.1 | 1.2 | 25.8 | <0.1 | <0.1 | <0.1 | |
| Nickel | mg/kg | <0.7 | 180 | 980 | 45.4 | 12.5 | 15 | |
| Selenium | mg/kg | <1 | 430 | 12000 | <1 | <1 | <1 | |
| Zinc | mg/kg | <5 | 40000 | 730000 | 88 | 49 | 46 | |
| Natural Moisture Content | % | <0.1 | <i>nv</i> | <i>nv</i> | 7.4 | 8.4 | 5.3 | |
| Key | | | | | | | | |
| Value exceeds the LQM Residential Threshold Value without homegrown produce | | | | | | | | |
| Value exceeds the LQM Commercial Threshold Value | | | | | | | | |
| Method Detection Limit | | | | | | | | |
| Less than the MDL | | | | | | | | |
| No Value | | | | | | | | |
| Not Tested | | | | | | | | |

Volatile Organic Compounds (VOCs)

All VOC analyte concentrations recorded values below their relevant LOD and so are below the most conservative threshold value for the LQM/CIEH for HHRA (Human Health Risk Assessment) Residential Threshold at 1% SOM. See Table 4.2 below.

Semi Volatile Organic Compounds (SVOCs)

Only one parameter in one soil sample recorded a value above the laboratory's limit of detection (LOD) for SVOCs. Bis(2-ethylhexyl) phthalate for sample TP/S1 had a value of 339 ug/kg. There is no corresponding LQM/CIEH S4UL for this compound. As stated, all other SVOC parameters were below their relevant level of detection. There are no exceedances recorded when all other concentrations were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM. See Table 4.3 below.

| Table 4.2 Laboratory Test Results: SOIL Volatile Organic Compounds (VOC) Suites | | | | | | | |
|---|---------|-----|--|---|------------|------------|-------|
| Client: Indaver Ireland Location: Indaver Trasfer Sataion, Dublin Port AWN Ref: Indaver Licence Boundary Ref: 21/12185 | | | | | | | |
| Sample ID | Details | | | | SOIL | | |
| | | | | | TP/S1 | TP/S2 | TP/S3 |
| Depth (m) | | | | 0.25 | 0.3 | 0.35 | |
| Laboratory | | | | EMT | EMT | EMT | |
| Sample Type | | | | SOIL | SOIL | SOIL | |
| Sample Date | | | | 16/03/2021 | 16/03/2021 | 16/03/2021 | |
| Parameters | Units | MDL | LQM/CIEH S4ul for HHRA Residential Threshold at 1% SOM (mg/kg) | LQM/CIEH S4ul for HHRA Commercial Threshold at 1% SOM (mg/kg) | | | |
| VOC MS | ug/kg | <2 | | | | | |
| Dichlorodifluoromethane | ug/kg | <2 | | | - | - | |
| Methyl Tertiary Butyl Ether | ug/kg | <3 | | | - | - | |
| Chloromethane | ug/kg | <2 | | | - | - | |
| Vinyl Chloride | ug/kg | <1 | | | - | - | |
| Bromomethane | ug/kg | <2 | | | - | - | |
| Chloroethane | ug/kg | <2 | | | - | - | |
| Trichlorofluoromethane | ug/kg | <6 | | | - | - | |
| 1,1-Dichloroethene (1,1 DCE) | ug/kg | <30 | | | - | - | |
| Dichloromethane (DCM) | ug/kg | <3 | | | - | - | |
| trans-1-2-Dichloroethene | ug/kg | <3 | nv | nv | - | - | |
| 1,1-Dichloroethane | ug/kg | <3 | | | - | - | |
| cis-1-2-Dichloroethene | ug/kg | <4 | | | - | - | |
| 2,2-Dichloropropane | ug/kg | <3 | | | - | - | |
| Bromochloromethane | ug/kg | <3 | | | - | - | |
| Chloroform | ug/kg | <3 | | | - | - | |
| 1,1,1-Trichloroethane | ug/kg | <3 | | | - | - | |
| 1,1-Dichloropropene | ug/kg | <4 | | | - | - | |
| Carbon tetrachloride | ug/kg | <4 | | | - | - | |
| 1,2-Dichloroethane | ug/kg | <3 | | | - | - | |
| Benzene | mg/kg | <3 | 380 | 27600 | - | - | |
| Trichloroethene (TCE) | ug/kg | <6 | | | - | - | |
| 1,2-Dichloropropane | ug/kg | <3 | | | - | - | |
| Dibromomethane | ug/kg | <3 | nv | nv | - | - | |
| Bromodichloromethane | ug/kg | <4 | | | - | - | |
| cis-1-3-Dichloropropene | ug/kg | <3 | | | - | - | |
| Toluene | mg/kg | <3 | 88000 | 5600000(869)vap | - | - | |
| trans-1-3-Dichloropropene | ug/kg | <3 | | | - | - | |
| 1,1,2-Trichloroethane | ug/kg | <3 | | | - | - | |
| Tetrachloroethene (PCE) | ug/kg | <3 | | | - | - | |
| 1,3-Dichloropropane | ug/kg | <3 | | | - | - | |
| Dibromochloromethane | ug/kg | <3 | nv | nv | - | - | |
| 1,2-Dibromoethane | ug/kg | <3 | | | - | - | |
| Chlorobenzene | ug/kg | <3 | | | - | - | |
| 1,1,1,2-Tetrachloroethane | ug/kg | <3 | | | - | - | |
| Ethylbenzene | mg/kg | <5 | 83000 | 5700000(518)vap | - | - | |
| m/p-Xylene | mg/kg | <3 | m: 82000 p: 79000 | m: 6200000(625)vap p: 5900000(576)sol | - | - | |
| o-Xylene | mg/kg | <3 | 88000 | 6600000(478)sol | - | - | |
| Styrene | ug/kg | <3 | | | - | - | |
| Bromoform | ug/kg | <3 | | | - | - | |
| Isopropylbenzene | ug/kg | <3 | | | - | - | |
| 1,1,2,2-Tetrachloroethane | ug/kg | <2 | | | - | - | |
| Bromobenzene | ug/kg | <4 | | | - | - | |
| 1,2,3-Trichloropropane | ug/kg | <4 | | | - | - | |
| Propylbenzene | ug/kg | <3 | | | - | - | |
| 2-Chlorotoluene | ug/kg | <3 | | | - | - | |
| 1,3,5-Trimethylbenzene | ug/kg | <3 | | | - | - | |
| 4-Chlorotoluene | ug/kg | <5 | | | - | - | |
| tert-Butylbenzene | ug/kg | <6 | | | - | - | |
| 1,2,4-Trimethylbenzene | ug/kg | <4 | nv | nv | - | - | |
| sec-Butylbenzene | ug/kg | <4 | | | - | - | |
| 4-Isopropyltoluene | ug/kg | <4 | | | - | - | |
| 1,3-Dichlorobenzene | ug/kg | <4 | | | - | - | |
| 1,4-Dichlorobenzene | ug/kg | <4 | | | - | - | |
| n-Butylbenzene | ug/kg | <4 | | | - | - | |
| 1,2-Dichlorobenzene | ug/kg | <4 | | | - | - | |
| 1,2-Dibromo-3-chloropropane | ug/kg | <7 | | | - | - | |
| 1,2,4-Trichlorobenzene | ug/kg | <4 | | | - | - | |
| Hexachlorobutadiene | ug/kg | <27 | | | - | - | |
| Naphthalene | ug/kg | <7 | | | - | - | |
| 1,2,3-Trichlorobenzene | mg/kg | <19 | | | - | - | |

Key

Value exceeds the LQM Residential Threshold Value without homegrown produce

Undertlined Value exceeds the LQM Commercial Threshold Value

MDL Method Detection Limit

- Less than the MDL

nv No Value nt Not Tested

| Table 4.3 Laboratory Test Results: SOIL Semi Volatile Organic Compounds (SVOCs) Suites | | | | | | | | |
|---|---------|------|---|--|--------------------------|------------|------------|------------|
| Client: Indaver Ireland Location: Indaver Trasfer Sataion, Dublin Port AWN Ref: Indaver Licence Boundary Ref: 21/12185 | | | | | | | | |
| Sample ID | Details | | | | | SOIL | | |
| | | | | | | TP/S1 | TP/S2 | TP/S3 |
| Depth (m) | | | | | | 0.20-0.40 | 0.60-0.80 | 0.20-0.40 |
| Laboratory | | | | | | EMT | EMT | EMT |
| Sample Type | | | | | | SOIL | SOIL | SOIL |
| Sample Date | | | | | | 19/01/2020 | 19/01/2020 | 19/01/2020 |
| Parameters | Units | MDL | LQM/CI EH S4ul for HHRA Residential Threshold at 1% SOM (mg/kg) | LQM/CI EH S4ul for HHRA Commercial Threshold at 1% SOM (mg/kg) | | | | |
| SVOC MS | | | | | | | | |
| Phenols | | | | | | | | |
| 2-Chlorophenol | ug/kg | <10 | 94 | 3500 | - | - | - | |
| 2-Methylphenol | ug/kg | <10 | nv | nv | - | - | - | |
| 2-Nitrophenol | ug/kg | <10 | | | - | - | - | |
| 2,4-Dichlorophenol | ug/kg | <10 | | | - | - | - | |
| 2,4-Dimethylphenol | ug/kg | <10 | | | - | - | - | |
| 2,4,5-Trichlorophenol | ug/kg | <10 | | | - | - | - | |
| 2,4,6-Trichlorophenol | ug/kg | <10 | | | - | - | - | |
| 4-Chloro-3-methylphenol | ug/kg | <10 | | | - | - | - | |
| 4-Methylphenol | ug/kg | <10 | | | - | - | - | |
| 4-Nitrophenol | ug/kg | <10 | | | - | - | - | |
| Pentachlorophenol | ug/kg | <10 | | | 27 (16.4) ^{ADP} | 400 | - | - |
| Phenol | ug/kg | <10 | 750 | 760 (31000) | - | - | - | |
| PAHs | | | | | | | | |
| 2-Chloronaphthalene | ug/kg | <10 | nv | nv | - | - | - | |
| 2-Methylnaphthalene | ug/kg | <10 | | | - | - | - | |
| Phthalates | | | | | | | | |
| Bis(2-ethylhexyl) phthalate | ug/kg | <100 | nv | nv | 339 | - | - | |
| Butylbenzyl phthalate | ug/kg | <100 | | | - | - | - | |
| Di-n-butyl phthalate | ug/kg | <100 | | | - | - | - | |
| Di-n-Octyl phthalate | ug/kg | <100 | | | - | - | - | |
| Diethyl phthalate | ug/kg | <100 | | | - | - | - | |
| Dimethyl phthalate | ug/kg | <100 | | | - | - | - | |
| Other SVOCs | | | | | | | | |
| 1,2-Dichlorobenzene | ug/kg | <10 | nv | nv | - | - | - | |
| 1,2,4-Trichlorobenzene | ug/kg | <10 | | | - | - | - | |
| 1,3-Dichlorobenzene | ug/kg | <10 | | | - | - | - | |
| 1,4-Dichlorobenzene | ug/kg | <10 | | | - | - | - | |
| 2-Nitroaniline | ug/kg | <10 | | | - | - | - | |
| 2,4-Dinitrotoluene | ug/kg | <10 | | | - | - | - | |
| 2,6-Dinitrotoluene | ug/kg | <10 | | | - | - | - | |
| 3-Nitroaniline | ug/kg | <10 | | | - | - | - | |
| 4-Bromophenylphenylether | ug/kg | <10 | | | - | - | - | |
| 4-Chloroaniline | ug/kg | <10 | | | - | - | - | |
| 4-Chlorophenylphenylether | ug/kg | <10 | | | - | - | - | |
| 4-Nitroaniline | ug/kg | <10 | | | - | - | - | |
| Azobenzene | ug/kg | <10 | | | - | - | - | |
| Bis(2-chloroethoxy)methane | ug/kg | <10 | | | - | - | - | |
| Bis(2-chloroethyl)ether | ug/kg | <10 | | | - | - | - | |
| Carbazole | ug/kg | <10 | | | - | - | - | |
| Dibenzofuran | ug/kg | <10 | | | - | - | - | |
| Hexachlorobenzene | ug/kg | <10 | | | - | - | - | |
| Hexachlorobutadiene | ug/kg | <10 | | | - | - | - | |
| Hexachlorocyclopentadiene | ug/kg | <10 | | | - | - | - | |
| Hexachloroethane | ug/kg | <10 | | | - | - | - | |
| Isophorone | ug/kg | <10 | | | - | - | - | |
| N-nitrosodi-n-propylamine | ug/kg | <10 | | | - | - | - | |
| Nitrobenzene | ug/kg | <10 | - | - | - | | | |

Key

Value exceeds the LQM Residential Threshold Value without homegrown produce

Underlined Value exceeds the LQM Commercial Threshold Value

MDL Method Detection Limit

- Less than the MDL

nv No Value nt Not Tested

Polychlorinated Biphenyls (PCBs)

All analytes recorded were below the laboratory's LOD for all three (3) no. soil samples collected. Although there are currently no corresponding S4ULs for PCBs it can be assumed by the fact that there are none of the samples exceed the corresponding LOD that there is no evidence of a PCB source on or off site impacting the proposed area of surrender. See Table 4.4 below.

| Table 4.4 Laboratory Test Results: POLYCHLORINATED BIPHENYLS | | | | | | SOIL | | |
|---|---------|-----|--|---|---|------------|------------|------------|
| Client: Indaver Ireland | | | | | | TP/S1 | TP/S2 | TP/S3 |
| Location: Indaver Trasfer Sataion, Dublin Port | | | | | | | | |
| AWN Ref: Indaver Licence Boundary | | | | | | | | |
| Ref: 21/12185 | | | | | | | | |
| Sample ID | Details | | | | | 0.25 | 0.3 | 0.35 |
| Depth | | | | | | EMT | EMT | EMT |
| Laboratory | | | | | | SOIL | SOIL | SOIL |
| Sample Type | | | | | | 16/03/2021 | 16/03/2021 | 16/03/2021 |
| Sample Date | | | | | | | | |
| Parameters | Units | MDL | LQM/CIEH S4ul for HHRA Residential Threshold at 1% SOM (mg/kg) | LQM/CIEH S4ul for HHRA Commercial Threshold at 1% SOM (mg/kg) | | | | |
| PCB 28 | ug/kg | <10 | nv | nv | - | - | - | |
| PCB 52 | ug/kg | <10 | | | - | - | - | |
| PCB 101 | ug/kg | <10 | | | - | - | - | |
| PCB 118 | ug/kg | <10 | | | - | - | - | |
| PCB 138 | ug/kg | <10 | | | - | - | - | |
| PCB 153 | ug/kg | <10 | | | - | - | - | |
| PCB 180 | ug/kg | <10 | | | - | - | - | |
| Total 7 PCBs | ug/kg | <35 | | | - | - | - | |
| Key | | | | | | | | |
| Value exceeds the LQM Residential Threshold Value without homegrown produce | | | | | | | | |
| Value exceeds the LQM Commercial Threshold Value | | | | | | | | |
| Method Detection Limit | | | | | | | | |
| Less than the MDL | | | | | | | | |
| No Value | | | | | | | | |
| nt Not Tested | | | | | | | | |

4.2 Water Quality

A study carried out in 1998 by K.T. Cullen & Co. Ltd (KD Environmental, 2021), states that the shallow water table on the site is approximately 3.0 m below ground level, while results of previous studies in the Docklands area have shown that shallow groundwater can vary between 1.0 – 3.0 m. The groundwater level is tidally influenced. A study of aquifer vulnerability for Dublin City has been made by Geological Survey of Ireland (GSI) and a groundwater classification for Dublin city shows aquifer vulnerability in Dublin Port being low (KD Environmental, 2021).

As required under Schedule D of IED licence W0036-02, Indaver undertakes groundwater sampling and analysis from two groundwater boreholes on site – GM1 (downgradient of the proposed surrendered plot) and GM2 (upgradient of the proposed surrendered plot - see Appendix 3). This is performed quarterly. The EPA has set trigger limits for each groundwater parameter, these include;

- pH
- Conductivity
- Iron
- Manganese
- Aluminium

- Total ammonia
- Non-purgeable organic Carbon
- Heavy Metals
- Semi-Volatile Organic Compounds

As per Indaver's 2020 AER submission to the EPA there is no indication of groundwater pollution at the site with all samples collected for the last 5 years below their relevant trigger values (Indaver AER, 2021).

The Dublin Groundwater Body (GWB) underlies the site (IE_EA_G_008). The EPA currently categorises the Dublin GWB as under review, meaning there is more information required to accurately project the GWB's Waste Framework Directive (WFD) risk. The Dublin GWB was awarded a status of 'Good' in the previous WFD assessment round 2013-2018.

5.0 CONCEPTUAL SITE MODEL

A local cross-section and a regional cross-section are presented below in Figure 5.1 and Figure 5.2 respectively. These cross-sections were developed with the data collected from both the most recent site investigations, other investigations in the area and data made available to AWN. The conceptual site model (CSM) for the parcel of land to the south west of the Indaver site proposed for surrender is as follows:

- The Indaver facility is located in the eastern part of Dublin port surround by a number of industrial buildings.
- The parcel of land to be surrendered is small (circa 60 m²) and located to the south west of the site. The area is required in order to be used for upgrading of the port's road network.
- The Dublin Port area was reclaimed from estuarine/tidal deposits. This was part of enlargement schemes undertaken by the Dublin Port Company from the 1920s onwards. As such, the subsurface soils on the site consist of pumped fill comprising sandy gravel underlain by silt, sand and gravel.
- Onsite conditions showed shallow soils to be primarily consisting of clay fill material to the west of the small parcel of land (S1) with sands (imported) at locations S2 & S3.
- The bedrock beneath the site is Limestone. The aquifer underlying the western section of Dublin Port (not the Indaver facility) this is classified by the GSI as a (LI) Locally Important Aquifer). Results of previous studies in the Docklands area (KD Environmental, 2021) have shown that shallow groundwater can vary between 1.0 – 3.0 m. The groundwater level is tidally influenced.
- Based on OSI historical maps, consultation with Indaver personnel and evidence on the ground currently or historically there have been no structures, tanks or underground services located within the proposed surrendered parcel of land. As such there is currently or historically no source of contamination present. Groundwater sampling from onsite boreholes GM1 & GM2 (downgradient and upgradient of the proposed surrendered plot) as part of the wider Indaver's site licence requirements show no signs of contamination indicating there is no off-site source of contamination present at the site.
- Soil sampling and analysis undertaken in March 2021 showed no residual contamination at the site.
- Potential environmental receptors are indicated and include the underlying aquifer and nearby North Dublin Bay SAC– site code 00206 and South Dublin Bay & the River Tolka Estuary SPA (Special Protected Area) – site code

004024. However, as stated above as there are no sources of contamination identified at the parcel of land to be surrendered there is no risk to any offsite environmental receptors or the underlying aquifer.

6.0 CONCLUSIONS

On the basis of assessment undertaken by AWN Consulting, AWN is satisfied that the proposed area of land to the south west of the Indaver site is suitable for removal from the current licence boundary in accordance with the EPA's Guidance to Licensees on Surrender, Cessation and Closure of Licenced Site 2012, namely:

- (i) *That the technical unit and any equipment or materials located on the site are not causing or likely to cause pollution.* There is no equipment or materials on site currently or in the past which could cause pollution.
- (ii) *That the site (including subsoil and groundwater) is in a satisfactory state.*

No apparent sources of pollution were recorded, and shallow soil sampling showed the underlying material to be relatively clean. There is no risk to onsite or offsite receptors.

7.0 REFERENCES

Environment Agency (UK). Model Procedures for the Management of Land Contamination (CLR 11)

Environmental Protection Agency (EPA) Guidance on the Authorisation of Discharges to Groundwater, 2012

Environmental Protection Agency (EPA) Guidance to Licensees on Surrender, Cessation and Closure of Licenced Site. EPA, 2012

Geological Survey of Ireland (GSI) 2021. Online Mapping Tool [accessed 11th April 2021

<https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>]

Indaver Ireland Limited IE Licence W0036-02 AER 2021 (2020 Data)

Indaver Ireland Limited IE Licence W0036-02 Groundwater Report Q4 2020. Submission to the EPA in compliance with their IE Licence.

KD Environmental (2021) Indaver Ireland Residuals Management Plan 8th February 2021. Report No. 2020/45/03

Ordinance Survey of Ireland (OSI) 2021. Online Mapping Tool (Geohive) [accessed 11th April 2021 <http://map.geohive.ie/mapviewer.html>]


APPENDIX 1
TRIAL PIT LOGS
AWN (2021)

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| | |
|-----------------------|---------------|
| Trial Pit Log: | TP1/S1 |
| Sheet 1/3 | |

| | | |
|---------------------------|---|-----------------------------|
| AWN Project Ref: 21_12185 | Client: Indaver Ireland | Excavation date: 16/03/2021 |
| Ground Level (mAOD): | Location: Transfer station, Dublin Port | Geology log: PC |
| Grid Reference: | | |

| SUBSURFACE PROFILE | | Depth mbgl (mbgl) | Lithology | Reinstatement Details |
|---|--|------------------------------------|--|-----------------------------|
| Ground surface | | | | |
| 0.0 | | | | |
| 0.1 | Sandy gravelly CLAY with cobbles and boulders. Gravels are sub angular to subrounded. Cobbles are sub rounded. | 0.10 |  | BACKFILLED WITH ARISINGS |
| 0.2 | | | | |
| 0.3 | | | | |
| 0.4 | | | | |
| 0.5 | END OF TRIAL PIT 0.3 mbgl | | | |
| 0.6 | | | | |
| 0.7 | | | | |
| 0.8 | | | | |
| 0.9 | | | | |
| 1.0 | | | | |
| 1.1 | | | | |
| 1.2 | | | | |
| 1.3 | | | | |
| 1.4 | | | | |
| 1.5 | | | | |
| 1.6 | | | | |
| 1.7 | | | | |
| 1.8 | | | | |
| 1.9 | | | | |
| 2.0 | | | | |
| 2.1 | | | | |
| 2.2 | | | | |
| 2.3 | | | | |
| 2.4 | | | | |
| 2.5 | | | | |
| 2.6 | | | | |
| 2.7 | | | | |
| 2.8 | | | | |
| 2.9 | | | | |
| 3.0 | | | | |
| Excavation Method: Hand Dug | | Pit dimensions: 0.5m X 0.5m X 0.3m | | |
| Comments: No signs of contamination. Overcast & Dry | | G/level (mAOD): - | | |
| | | | | |
| | | Water Strikes (mbgl): - - - | | |
| Contractor: N/A | | Static Water Level (mbgl): - | | |

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| | |
|-----------------------|---------------|
| Trial Pit Log: | TP2/S2 |
| Sheet 2/3 | |

| | | |
|---------------------------|---|-----------------------------|
| AWN Project Ref: 21_12185 | Client: Indaver Ireland | Excavation date: 16/03/2021 |
| Ground Level (mAOD): | Location: Transfer Station, Dublin Port | Geology log: PC |
| Grid Reference: | | |



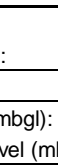
| SUBSURFACE PROFILE | | Depth mbgl (mbgl) | Lithology | Reinstatement Details | | | |
|-----------------------|--|-------------------|---|--------------------------|-----------------|-----------------------|---|
| Ground surface | | | | | | | |
| 0.0 | Imported sands with occasional flecks of red brick | 0.30 | | BACKFILLED WITH ARISINGS | | | |
| 0.1 | | | | | | | |
| 0.2 | | | | | | | |
| 0.3 | | | | | | | |
| 0.4 | | | | | | | |
| 0.5 | Sand Extends to 1m | 1.00 | | BACKFILLED WITH ARISINGS | | | |
| 0.6 | | | | | | | |
| 0.7 | | | | | | | |
| 0.8 | | | | | | | |
| 0.9 | | | | | | | |
| 1.0 | END OF TRIAL PIT 1.0 mbgl | | | BACKFILLED WITH ARISINGS | | | |
| 1.1 | | | | | | | |
| 1.2 | | | | | | | |
| 1.3 | | | | | | | |
| 1.4 | | | | | | | |
| 1.5 | | | | | | | |
| 1.6 | | | | | | | |
| 1.7 | | | | | | | |
| 1.8 | | | | | | | |
| 1.9 | | | | | | | |
| 2.0 | | | | BACKFILLED WITH ARISINGS | | | |
| 2.1 | | | | | | | |
| 2.2 | | | | | | | |
| 2.3 | | | | | | | |
| 2.4 | | | | | | | |
| 2.5 | | | | | | | |
| 2.6 | | | | | | | |
| 2.7 | | | | | | | |
| 2.8 | | | | | | | |
| 2.9 | | | | | | | |
| 3.0 | Excavation Method: Hand dug/Augher | Pit dimensions: | 0.5m X 0.5m X 1.0m | | | | |
| | | | Comments: No signs of contamination. Overcast & Dry | G/level (mAOD): | - | | |
| | | | | | Contractor: N/A | Water Strikes (mbgl): | - |
| | | | Static Water Level (mbgl): | - | | | |

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| | |
|-----------------------|---------------|
| Trial Pit Log: | TP3/S3 |
| Sheet 1/1 | |

| | | |
|---------------------------|---|-----------------------------|
| AWN Project Ref: 21_12185 | Client: Indaver Ireland | Excavation date: 16/03/2021 |
| Ground Level (mAOD): | Location: Transfer Station, Dublin Port | Geology log: PC |
| Grid Reference: | | |

| SUBSURFACE PROFILE | | Depth mbgl (mAOD) | Lithology | Reinstatement Details |
|--|--|------------------------------------|--|--------------------------|
| Ground surface | | | | |
| 0.0 | Imported sands with occasional flecks of red brick and 1 small fleck of plastic. | 0.35 |  | BACKFILLED WITH ARISINGS |
| 0.1 | | | | |
| 0.2 | | | | |
| 0.3 | | | | |
| 0.4 | | | | |
| 0.5 | | | | |
| 0.6 | Sand Extends to 1m | 1.00 |  | BACKFILLED WITH ARISINGS |
| 0.7 | | | | |
| 0.8 | | | | |
| 0.9 | | | | |
| 1.0 | | | | |
| 1.1 | END OF TRIAL PIT 1.0 mbgl | |  | BACKFILLED WITH ARISINGS |
| 1.2 | | | | |
| 1.3 | | | | |
| 1.4 | | | | |
| 1.5 | | | | |
| 1.6 | | | | |
| 1.7 | | | | |
| 1.8 | | | | |
| 1.9 | | | | |
| 2.0 | | | | |
| 2.1 | | | | |
| 2.2 | | | | |
| 2.3 | | | | |
| 2.4 | | | | |
| 2.5 | | | | |
| 2.6 | | | | |
| 2.7 | | | | |
| 2.8 | | | | |
| 2.9 | | | | |
| 3.0 | | | | |
| Excavation Method: 5 Tonne Excavator | | Pit dimensions: 0.5m X 0.5m X 1.0m | | |
| Comments: No signs of contamination. Large amounts of vine roots at location. Dry & Overcast | | G/level (mAOD): - | | |
| | | Water Strikes (mbgl): - - - | | |
| Contractor: N/A | | Static Water Level (mbgl): - | | |

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APPENDIX 2
LAB ANALYSIS REPORT 21/4192
ELEMENT MATERIALS TECHNOLOGY (2021)

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AWN Consulting
Tecpro Building
Clonshaugh Business & Technology Park
Dublin
Dublin 17
Ireland



Attention : Paul Conaghan
Date : 31st March, 2021
Your reference : Indaver TS
Our reference : Test Report 21/4194 Batch 1
Location : Indaver Dublin Port
Date samples received : 22nd March, 2021
Status : Final report
Issue : 1

Three samples were received for analysis on 22nd March, 2021 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied. □

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

Consent of client/owner required for any other use.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Notification of Deviating Samples

Client Name: AWN Consulting
Reference: Indaver TS
Location: Indaver Dublin Port
Contact: Paul Conaghan

Matrix : Solid

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Analysis | Reason |
|---|-------|-----------|-------|----------------|----------|---|
| 21/4194 | 1 | S1 | 0.25 | 1-3 | VOC | Analysis taken from a previously sampled container. |
| 21/4194 | 1 | S2 | 0.30 | 4-6 | VOC | Analysis taken from a previously sampled container. |
| 21/4194 | 1 | S3 | 0.35 | 7-9 | VOC | Analysis taken from a previously sampled container. |
| For inspection purposes only. Consent of copyright owner required for any other use. | | | | | | |

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
 Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/4194

SOILS

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

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

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

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

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

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

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

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

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

| | |
|---------|---|
| # | ISO17025 (UKAS Ref No. 4225) accredited - UK. |
| SA | ISO17025 (SANAS Ref No.T0729) accredited - South Africa |
| B | Indicates analyte found in associated method blank. |
| DR | Dilution required. |
| M | MCERTS accredited. |
| NA | Not applicable |
| NAD | No Asbestos Detected. |
| ND | None Detected (usually refers to VOC and/SVOC TICs). |
| NDP | No Determination Possible |
| SS | Calibrated against a single substance |
| SV | Surrogate recovery outside performance criteria. This may be due to a matrix effect. |
| W | Results expressed on as received basis. |
| + | AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page. |
| >> | Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited. |
| * | Analysis subcontracted to an Element Materials Technology approved laboratory. |
| AD | Samples are dried at 35°C ±5°C |
| CO | Suspected carry over |
| LOD/LOR | Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS |
| ME | Matrix Effect |
| NFD | No Fibres Detected |
| BS | AQC Sample |
| LB | Blank Sample |
| N | Client Sample |
| TB | Trip Blank Sample |
| OC | Outside Calibration Range |

HWOL ACRONYMS AND OPERATORS USED

| | |
|-------|--|
| HS | Headspace Analysis. |
| EH | Extractable Hydrocarbons - i.e. everything extracted by the solvent. |
| CU | Clean-up - e.g. by florisil, silica gel. |
| 1D | GC - Single coil gas chromatography. |
| Total | Aliphatics & Aromatics. |
| AL | Aliphatics only. |
| AR | Aromatics only. |
| 2D | GC-GC - Double coil gas chromatography. |
| #1 | EH_Total but with humics mathematically subtracted |
| #2 | EU_Total but with fatty acids mathematically subtracted |
| _ | Operator - underscore to separate acronyms (exception for +). |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total |
| MS | Mass Spectrometry. |

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EMT Job No: 21/4194

| Test Method No. | Description | Prep Method No. (if appropriate) | Description | ISO 17025 (UKAS/S ANAS) | MCERTS (UK soils only) | Analysis done on As Received (AR) or Dried (AD) | Reported on dry weight basis |
|-----------------|---|----------------------------------|---|-------------------------|------------------------|---|------------------------------|
| PM4 | Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990. | PM0 | No preparation is required. | | | AR | |
| TM4 | Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS. | PM8 | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required. | | | AR | Yes |
| TM4 | Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS. | PM8 | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required. | Yes | | AR | Yes |
| TM15 | Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS. | PM10 | Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis. | | | AR | Yes |
| TM15 | Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS. | PM10 | Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis. | Yes | | AR | Yes |
| TM16 | Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS. | PM8 | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required. | | | AR | Yes |
| TM16 | Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS. | PM8 | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required. | Yes | | AR | Yes |
| TM17 | Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS. | PM8 | End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required. | Yes | | AR | Yes |
| TM30 | Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP | PM15 | Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground. | Yes | | AD | Yes |
| TM15_A | Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS. | PM10 | Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis. | | | AR | Yes |

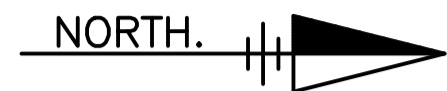
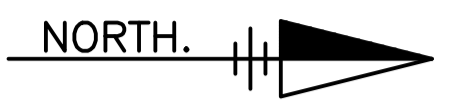
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APPENDIX 3
SERVICES/ SITE DRAWINGS.
INDAVER IRELAND Ltd (2021)

*For inspection purposes only.
Consent of copyright owner required for any other use.*

NOTES.

1. FOR STANDARD NOTES REFER TO DRAWING No. CD\000.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL, SERVICES & M.E.A. DRAWINGS.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED. LEVELS ARE STRUCTURAL LEVELS IN METERS TO ORDNANCE DATUM. THIS DRAWING MUST NOT BE SCALED.



TRAFFIC DIRECTION. ↑

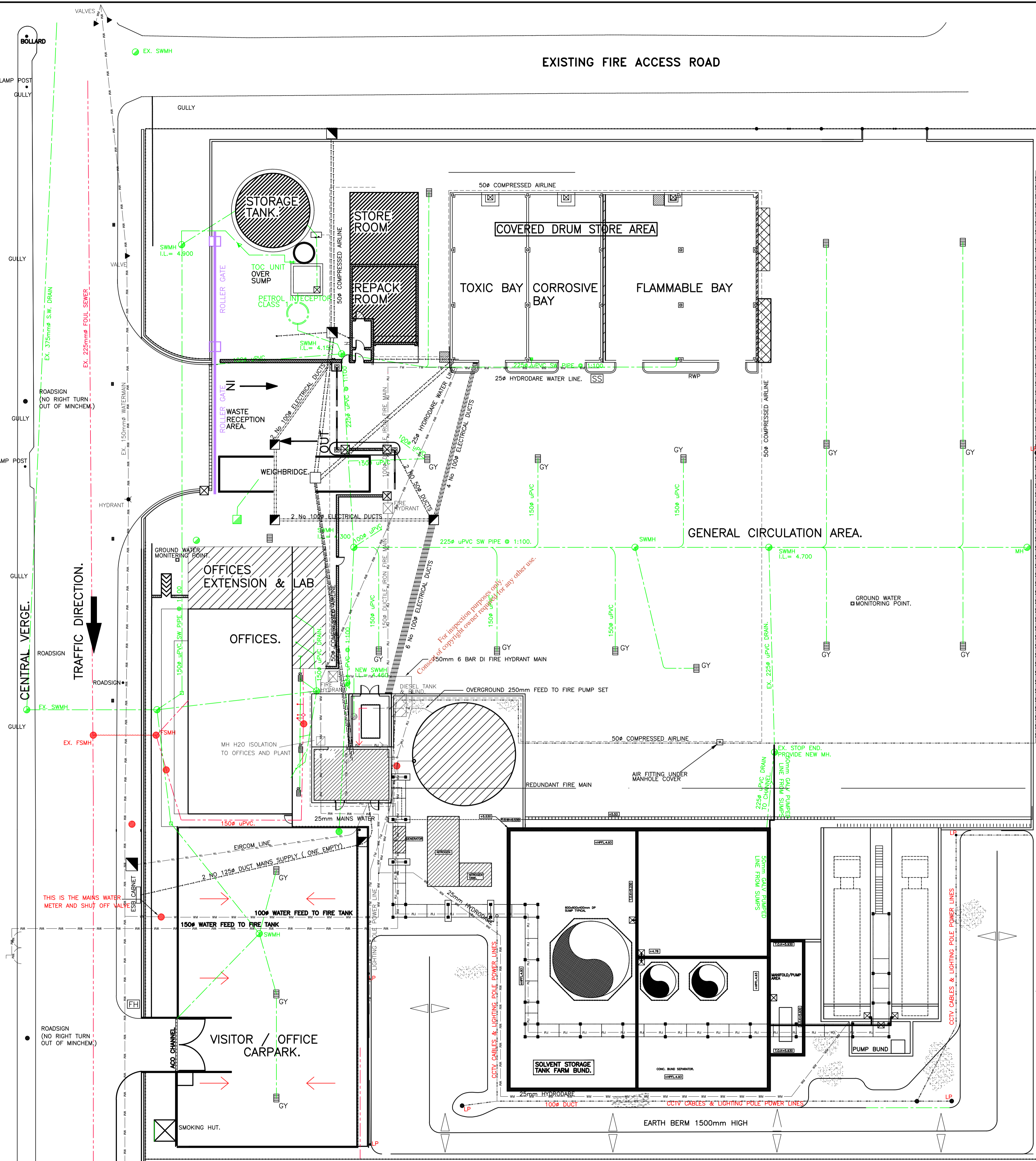
TRAFFIC DIRECTION. ↓

TOLKA QUAY ROAD

CENTRAL VERGE.

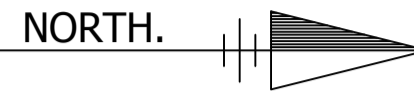
EXISTING FIRE ACCESS ROAD

PIPES PIT

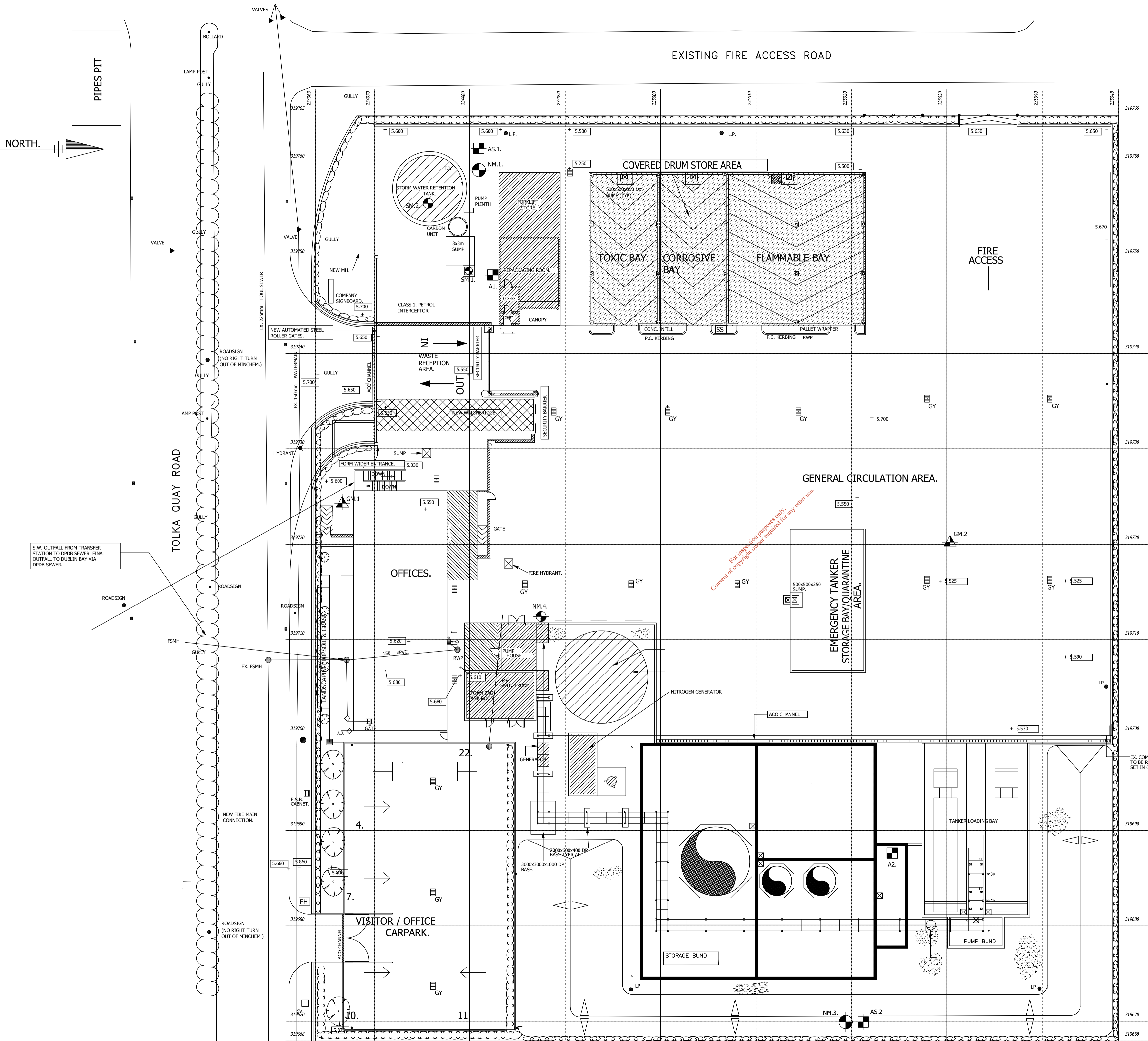


EXISTING SITE PLAN. SCALE 1:200.

| | | | | |
|---|---|----------|----------|-----------|
| A | AS BUILT. | DB | N.K. | 08.01.07 |
| REV: | DESCRIPTION. | BY: | APPR. | DATE. |
| CLIENT: | INDAVER IRELAND LTD | | | |
| PROJECT: | ALTERATIONS TO TRANSFER STATION CAMPUS | | | |
| TITLE: | EXISTING SITE PLAN UNDERGROUND SERVICES | | | |
|  Mc Elroy Associates Consulting Engineers 72 Haddington Road, Ballsbridge, D4. Tel: 660 9000 Fax: 660 9099 E-Mail: info@me.ie | | | | |
| DESIGNED: | NK | CHECKED: | NK | APPR'D: |
| DRAWN: | SP | DATE: | APRIL 06 | SCALE: |
| | | | | AS SHOWN. |
| DRG.No. 16008/CD/034 | | | | REV. A |



EXISTING FIRE ACCESS ROAD



LEGEND.

- SURFACE WATER MONITORING POINTS.
- NOISE MONITORING POINTS.
- GROUND WATER MONITORING POINTS.
- AIR MONITORING POINTS.

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IND-DPO-HSE-DWG-000-0120

| | | | | |
|------|------------------------------------|-----|-------|--------|
| D | GM1 REVISED LOCATION ISSUED TO EPA | C.J | PMG | JUL 06 |
| C | GM1 REVISED DRAFT FOR COMMENT | C.J | PMG | JUL 06 |
| F | MOD19 | NCI | | FEB 18 |
| E | MOD17 | NCI | | FEB 18 |
| REV. | DESCRIPTION. | BY. | APPR. | DATE. |

CLIENT: **INDAVER IRELAND LIMITED**

PROJECT: **TRANSFER STATION AND FUEL BLENDING FACILITY**

TITLE: **MONITORING POINTS LAYOUT SITE PLAN**

McElroy Associates
Consulting Engineers

72 Haddington Road, Ballsbridge, D4.
Tel: 660 9000 Fax: 660 9099
E Mail: info@mea.ie

| | | |
|-----------|---------------|-----------------|
| DESIGNED: | CHECKED: | APPRD: |
| DRAWN: | DATE: July 06 | SCALE: AS SHOWN |

IE-DPO-HSE-DWG-000-0120 REV. F

PROPOSED SITE PLAN. SCALE 1:200