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Preliminary Site Assessment

Site 64 Inchicore – Poolbeg 220 kV

Electricity Supply Board

Project number: PR-427640_ACM_RP_ENV_061_0

09 April 2020

Quality Information

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The site reconnaissance consisted of a general external inspection of the site aimed at identifying potential sources of ground contamination affecting the site. An environmental compliance audit and/or detailed structural inspection of existing buildings were outside the project brief. Similarly, the site visit excluded detailed consideration of the ecological or archaeological aspects of the site, and if such are believed to be of potential significance then it is recommended that specialist advice is sought.

Any risks identified in this Report are perceived risks, based on the information reviewed during the desk study and therefore partially based on conjecture from available information. The study is limited by the non-intrusive nature of the work and actual risks can only be assessed following a physical investigation of the site.

It should be noted that the effects of ground and water borne contamination on the environment are constantly under review, and authoritative guidance values are potentially subject to change. The conclusions presented herein are based on the guidance values available at the time this Report was prepared, however, no liability by AECOM can be accepted for the retrospective effects of any changes or amendments to these values.

The opinions expressed in this report and the comments and recommendations given are based on a desk assessment of readily available information and an initial site reconnaissance by an AECOM employee. At this stage intrusive investigations have yet to be undertaken at site to establish actual ground and groundwater conditions and to provide data for an assessment of the geo-environmental status of the site.

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Reference to historical Ordnance Survey (OS) maps and/or data provides invaluable information regarding the land use history of a site. However, it should be noted that historical evidence will be incomplete for the period pre-dating the first edition and between the release of successive maps and/or data.

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ABBREVIATIONS

AECOM	AECOM Ireland Limited
APEC	Area of Potential Environmental Concern
bgl	Below Ground Level
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CSM	Conceptual Site Model
ESB	Electricity Supply Board
EPA	Environmental Protection Agency
GSI	Geological Survey Ireland
IEL	Industrial Emissions Licence
IPC	Integrated Pollution Control
ITM	Irish Transverse Mercator
km	Kilometre
kV	Kilovolt
LAB	Linear Alkyl Benzene
m OD	Metres above Ordnance Datum
NHA	Natural Heritage Areas
NAPL	Non-Aqueous Phase Liquid
NPWS	National Park and Wildlife Service
NWCPO	National Waste Collection Permit Office
OECD	Organisation for Economic Co-operation and Development
OPW	Office of Public Works
OSI	Ordnance Survey Ireland
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCOC	Potential Constituents of Concern
pNHA	Proposed Natural Heritage Area
PSA	Preliminary Site Assessment
RFP	Request for Proposal
SAC	Special Area of Conservation
SDS	Safety Data Sheet
SIDS	Screening Information Datasets
SPA	Special Protection Area
TPH	Total Petroleum Hydrocarbons
WAC	Waste Acceptance Criteria
WFD	Water Framework Directive

EXECUTIVE SUMMARY

Introduction

AECOM Ireland Limited (AECOM) completed a Preliminary Site Assessment (PSA) of a cable fluid leak location adjacent to the Grand Canal along the Davitt Road and Red Line LUAS walkway, Drimnagh, Dublin 12 (the site).

ESB Networks operates and maintains a network of High Voltage (HV) underground cables of over 1,600 kilometres (km) across Ireland, of which approximately 175 km are insulated by a cable fluid. The majority of the fluid filled cables are located in urban settings across Dublin City and Cork City. The remainder are located outside these areas, with limited numbers of fluid filled cables in other counties.

The length of each cable route varies and cable routes frequently extend across county boundaries. The cable fluid acts as an electrical insulator and aids the conduction of heat away from the conductor allowing the cable to be run more efficiently. Fluid filled cables are largely located in urban/suburban areas and so are particularly vulnerable to third party interference or damage. Over time cables can develop leaks due to corrosion / fracture/ defects in the cable sheath and in joints and terminations. When such leaks occur there is potential for pollution to occur to surface water, groundwater, soils and ecology.

A leak was identified by Electricity Supply Board (ESB) at this site in May 2003 and repaired the same month. AECOM understand that the fluid type lost from the cable was a low viscosity blend of linear alkyl benzene (LAB).

Objective

The assessment reported herein comprises the first step of Stage 1: Site Characterisation & Assessment – Preliminary Site Assessment (PSA) and was carried out in accordance with *EPA Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (July 2013),* and specifically the Guideline Template for Preliminary Site Assessment Report. This guidance draws on the *EPA Code of Practice (CoP), Code of Reference for Unregulated Waste Disposal Sites (2007*) and *UK Environment Agency, Model Procedures for the Management of Land Contamination, Contaminated Land Report (CLR) 11 (September 2004).*

In terms of the data requirement for PSA reports, both the EPA CoP and CLR 11 outline that the findings of this initial risk assessment stage are largely based on desk-study information and a site walkover to identify potential pollutant linkages, which are then evaluated using appropriate criteria.

As such, the objective of the PSA reported herein is to:

- Identify potential contamination sources (i.e. the cable fluid), pathways (i.e. breathing in vapours, movement through made ground / soil) and receptors (i.e. who/what will be affected) and the likely interactions between each element;
- Assess the potential severity of the hazard and the sensitivity of the receptor (ranging from minor to severe);
- Assess the likelihood that a risk will occur (ranging from unlikely to high likelihood); and
- Develop a preliminary conceptual site model (CSM) based on an overall assessment of each of these elements above.

The preliminary CSM will then be used to identify potential risks to human health (site users and/or nearby residents) and controlled waters (i.e. groundwater and surface water) which may be associated with a fluid leak from the identified location. It should be noted that this stage of the risk assessment process is based mostly on qualitative information sources and identification of a potential risk at this stage does not necessarily indicate the presence of a risk, but rather the need for further assessment.

A table cross referencing the template headings from the EPA Guidance Template and where the corresponding information is reported herein is presented in Appendix B.

Assessment Findings

Based on the findings of the desktop study, the overall environmental sensitivity of the site is considered to be moderate. Identified sensitive receptors within 1 km of the site include:

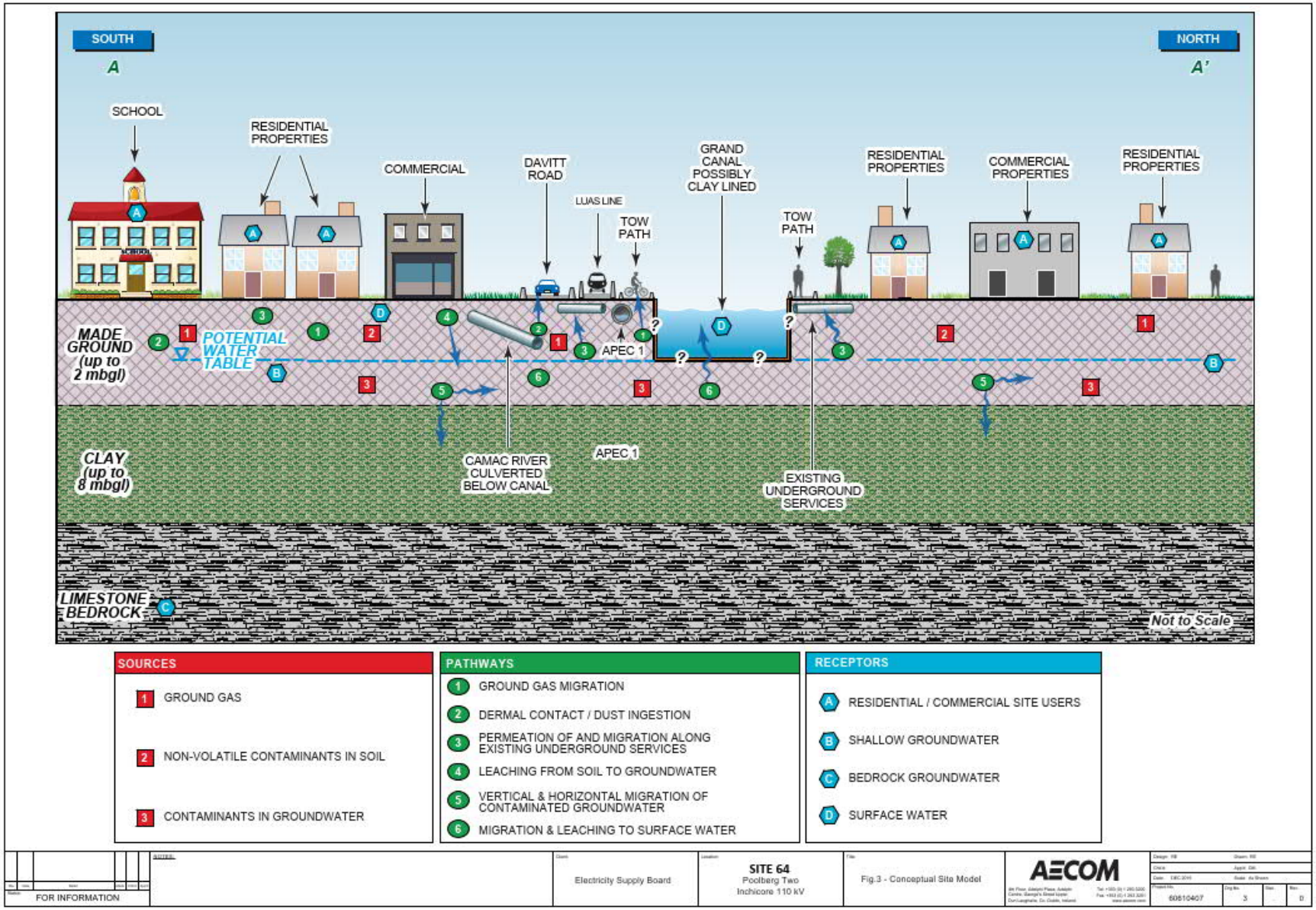
- The Grand Canal bounds the site to the north. Although this may be protected by low permeability clay (natural and/or engineered when the canal was constructed);
- The River Camac located approximately 600 m west of the site, although this may be protected by low permeability clay deposits which are likely to be encountered beneath the site; and
- The groundwater aquifer beneath the site, although this may also be protected by low permeability clay deposits, likely to be encountered beneath the site.

It is estimated that 300 litres of cable fluid (Linear Alkyl Benzene (T 3788)) was released in May 2003. Due to its high biodegradability, it is considered that LABs are of less concern for adverse environmental impact than other hydrocarbon fluids. A summary of the source audit findings is as follows:

Area of Potential Environmental Concern

Number	APEC	Potential Contaminants of Concern	Potential Media Impacted
1	Leak at (64) Inchicore Poolbeg 220 kV (May 2003)	LABs	Soil Groundwater Ground Gas

The preliminary CSM developed for the site looked at potential SPR linkages identified during the assessment works and found that potential risks were considered to be low. Based on these findings, further assessment is not considered to be required as no viable SPR linkages have been identified.


SOUTH
A
NORTH
A'
SCHOOL
RESIDENTIAL PROPERTIES
COMMERCIAL
DAVITT ROAD
LUAS LINE
TOW PATH
GRAND CANAL POSSIBLY CLAY LINED
TOW PATH
RESIDENTIAL PROPERTIES
COMMERCIAL PROPERTIES
RESIDENTIAL PROPERTIES
MADE GROUND (up to 2 mbgl)
POTENTIAL WATER TABLE
APEC 1
CLAY (up to 8 mbgl)
CAMAC RIVER CULVERTED BELOW CANAL
APEC 1
EXISTING UNDERGROUND SERVICES
LIMESTONE BEDROCK
Not to Scale
SOURCES
1 GROUND GAS
2 NON-VOLATILE CONTAMINANTS IN SOIL
3 CONTAMINANTS IN GROUNDWATER
PATHWAYS
1 GROUND GAS MIGRATION
2 DERMAL CONTACT / DUST INGESTION
3 PERMEATION OF AND MIGRATION ALONG EXISTING UNDERGROUND SERVICES
4 LEACHING FROM SOIL TO GROUNDWATER
5 VERTICAL & HORIZONTAL MIGRATION OF CONTAMINATED GROUNDWATER
6 MIGRATION & LEACHING TO SURFACE WATER
RECEPTORS
A RESIDENTIAL / COMMERCIAL SITE USERS
B SHALLOW GROUNDWATER
C BEDROCK GROUNDWATER
D SURFACE WATER
FOR INFORMATION
Electricity Supply Board
SITE 64
Poolberg Two
Inchicore 110 kV
Fig.3 - Conceptual Site Model
AECOM
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EPA Contaminated Land and Groundwater Risk Assessment Methodology

Table 1 EPA Methodology

Stage	Methodology	Report Reference	Report Date	Status
Stage 1: Site Characterisation and Assessment				
1.1	Preliminary Site Assessment	PR-427640_ACM_RP_ENV_061	09 April 2020	Final
1.2	Detailed Site Assessment			
1.3	Quantitative Risk Assessment			
Stage 2: Corrective Action and Feasibility Design				
2.1	Outline Corrective Action Strategy			
2.2	Feasibility Study and Outline Design			
2.3	Detailed Design			
2.4	Final Strategy and Implementation Plan			
Stage 3: Corrective Action Implementation and Aftercare				
3.1	Enabling Works			
3.2	Corrective Action Implementation and Verification			
3.3	Aftercare			

Source: EPA Guidance on the Management of Contaminated Land at EPA Sites

1. Introduction

AECOM Ireland Limited (AECOM) is pleased to present this preliminary site assessment (PSA) completed on behalf of Electricity Supply Board (ESB) for a site adjacent to the Grand Canal along the Davitt Road, Drimnagh, Dublin 12, (the site).

This report was commissioned by ESB under a request for proposal (RFP) issued on 26 June 2019 (Ref. Qd-354120-01R460_002-001-001) and carried out in accordance with AECOM proposal reference: PR-427640_ACM_PL_ENV_001_3, dated 03 July 2019. AECOM understand that ESB has undertaken these works on behalf of ESB Networks.

1.1 Project Background

ESB Networks operates and maintains a network of High Voltage (HV) underground cables of over 1,600 kilometres (km) across Ireland, of which approximately 175 km are insulated by a cable fluid. The majority of the fluid filled cables are located in urban settings across Dublin City and Cork City. The remainder are located outside these areas, with limited numbers of fluid filled cables in other counties.

The length of each cable route varies and cable routes frequently extend across county boundaries. The cable fluid acts as an electrical insulator and aids the conduction of heat away from the conductor allowing the cable to be run more efficiently. Fluid filled cables are largely located in urban/suburban areas and so are particularly vulnerable to third party interference or damage. Over time cables can develop leaks due to corrosion/fracture/defects in the cable sheath and in joints and terminations. When such leaks occur, there is potential for pollution to occur to surface water, groundwater, soils and ecology.

A leak was identified by Electricity Supply Board (ESB) at this site in May 2003 and repaired the same month. AECOM understand that the fluid type lost from the cable was a low viscosity blend of linear alkyl benzene (LAB).

The site location is presented in Figure 1 and the site layout showing the site is presented in Figure 2.

1.2 Project Objective

The assessment reported herein comprises the first step of Stage 1: Site Characterisation & Assessment – Preliminary Site Assessment (PSA) and was carried out in accordance with *EPA Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (July 2013),* and specifically the Guideline Template for Preliminary Site Assessment Report. This guidance draws on the *EPA Code of Practice (CoP), Code of Reference for Unregulated Waste Disposal Sites (2007*) and *UK Environment Agency, Model Procedures for the Management of Land Contamination, Contaminated Land Report (CLR) 11 (September 2004).*

In terms of the data requirement for PSA reports, both the EPA CoP and CLR 11 outline that the findings of this initial risk assessment stage are largely based on desk-study information and a site walkover to identify potential pollutant linkages, which are then evaluated using appropriate criteria.

As such, the objective of the PSA reported herein is to:

- Identify potential contamination sources (i.e. the cable fluid), pathways (i.e. breathing in vapours, movement through made ground / soil) and receptors (i.e. who/what will be affected) and the likely interactions between each element;
- Assess the potential severity of the hazard and the sensitivity of the receptor (ranging from minor to severe);
- Assess the likelihood that a risk will occur (ranging from unlikely to high likelihood); and
- Develop a preliminary conceptual site model (CSM) based on an overall assessment of each of these elements above.

The preliminary CSM will then be used to identify potential risks to human health (site users and/or nearby residents) and controlled waters (i.e. groundwater and surface water) which may be associated with a fluid leak from the identified location. It should be noted that this stage of the risk assessment process is based mostly on qualitative information sources and identification of a potential risk at this

stage does not necessarily indicate the presence of a risk, but rather the need for further assessment.

A table cross referencing the template headings from the EPA Guidance Template and where the corresponding information is reported herein is presented in Appendix B.

2. Scope of Work

To achieve the above objective, the following scope of work was undertaken:

- A site walkover by AECOM staff (completed on 01 November 2019);
- A desktop review of site history to identify areas of potential environmental concern (APEC);
- A desktop review of publicly available information regarding the site's environmental setting and sensitivity, including:
  - Geological Survey of Ireland (GSI) Groundwater Public Viewer Maps (https://dcenr.maps.arcgis.com/apps/MapSeries), accessed 25 October 2019;
  - EPA Geoportal Site (https://gis.epa.ie/EPAMaps), accessed 25 October 2019;
  - EPA Incidents Database (https://www.epa.ie/newsandevents/incidents/recent/), 25 October 2019
  - Ordnance Survey of Ireland (OSI) (http://geohive.ie), accessed 25 October 2019;
  - Glucksman Map Library, Trinity College, Dublin, 06 August 2019;
  - Office of Public Works (OPW) Flood Maps (http://www.floodinfo.ie), accessed 25 October 2019;
  - National Parks and Wildlife Service (NPWS) (http://webgis.npws.ie/npwsviewer/), accessed 25 October 2019;
  - National Waste Collection Permit Office (NWCPO) website (http://www.nwcpo.ie/), accessed 25 October 2019;
- A review of information provided by ESB in the RFP; and
- Data assessment and reporting.

3. Environmental Setting

3.1 Topography

The site is located at an elevation of approximately 30 m above Ordnance Datum (m OD). The land to the north slopes down towards Grand Canal, while the land to the east, south and west remains relatively flat.

3.2 Geology

The Teagasc Soils Map indicates the site locality comprises urban sediment. Immediately underlying the site and along the route of the Grand Canal to the east and west of the site, the Quaternary geology is classified as urban. The surrounding areas to the north and south are classified as till derived from the underlying limestone bedrock.

The GSI Bedrock Geology Map (scale 1:100,000) indicates the site is underlain by marine basinal facies, a dark fine-grained limestone and shale of the Lucan formation. No geological features are noted within the surrounding area.

A number of geotechnical records are located within the vicinity of the site. Immediately east of the site, adjacent to the banks of the Grand Canal the stratigraphic sequence was recorded as overburden to 3.96 meters below ground level (m bgl) directly overlying bedrock. A site investigation north of the site recorded topsoil to approximately 0.4 m bgl, overlying fill to approximately 1.4 m bgl, which was underlain by clay to a maximum depth of 5 m bgl where the investigation terminated.

3.3 Hydrology

3.3.1 Surface Water Features

The site lies within the lower catchment of the River Liffey and Dublin Bay, which covers an area of 1,624 km^2.

The closest surface water body to the site is the Grand Canal, located adjacent to the indicative leak location to the north. The canal flows to the east and discharges to the River Liffey Estuary approximately 6 km northeast of the site which flows into Dublin Bay (a SAC). As impervious materials are generally used to line canals during construction, it is not considered likely that the Grand Canal is in hydrological continuity with groundwater in the area.

The Camac River is located approximately 600 m west of the site and flows in an easterly direction and discharges into the River Liffey.

The River Liffey, located approximately 1.2 km north of the site flows into South Dublin Bay (an SAC). This comprises the following protected sites:

- South Dublin Bay Special Area of Conservation (SAC) (Site Code 000210);
- South Dublin Bay and River Tolka Special Protection Area (SPA) (Site Code 004024); and
- South Dublin Bay proposed Natural Heritage Area (pNHA) (Site Code 000210).

Given their proximity to the site, the Grand Canal and Camac River are considered to be the most sensitive surface water receptors.

3.3.2 Surface Water Quality

The Grand Canal, which bounds the site to the north, is referred to as an Artificial Water Body (AWB) by the EPA under the Water Framework Directive (WFD). Waterways Ireland assess the biological quality of the Grand Canal, which along the section adjacent to the site during the period 2015 – 2017 was classified as 'Good' quality[1].

The most significant natural surface water feature in the wider area is the Camac River. The most recent reported EPA water quality status of the Camac River (monitoring station below Blackhorse Bridge) is a Q Value of 3 and a rating 'Poor'. The WFD ecological status of the Camac River is characterised as being at risk of not meeting its WFD objectives.

The most significant surface water feature in the wider area is the River Liffey Estuary. The WFD status of both the upper and lower sections of the estuary (classified as a Transitional Water Body) is classified as 'Moderate' and characterised as being at risk of not meeting its WFD objectives.

3.3.3 Flooding

According to OPW Flood Maps, the site does not lie within the "River – Low Probability", "River – Medium Probability" or "River – High Probability" modelled extent of land that might be flooded by rivers in a moderate to very extreme event.

Parts of the surrounding area located within a 1 km radius to the northwest and southeast of the site lie within the "River – Low Probability", "River – Medium Probability" and "River – High Probability" indicating that flooding by rivers may occur during moderate to very extreme event in these areas.

The site is not in close proximity to the extent of land affected by coastal flood events.

3.4 Hydrogeology

3.4.1 Aquifer Classification

According to the GSI, the bedrock aquifer beneath the site is classified as a Locally Important Aquifer that is moderately productive in local zones. The soil permeability in the surrounding area is low;

[1] EPA, *Water Quality in 2017, An Indicators Report*, 2018

consequently the groundwater recharge in this aquifer is estimated by the GSI to be approximately 70 millimetres/year (mm/yr).

Regional groundwater flow direction is likely to be to the north towards the River Liffey. A more detailed site assessment would be required to assess the local groundwater flow regime.

According to the GSI wells and springs database, there are no springs or groundwater wells located within 1 km of the site.

The site is not mapped as being located within a Source Protection Area for either a public water supply or a group water supply scheme.

3.4.2 Groundwater Vulnerability

The GSI National Groundwater Vulnerability Mapping identified that the groundwater under the site was of 'High vulnerability'. However, some spatial variation in groundwater vulnerability is seen in the greater surrounding area of the site where approximately 40 m – 50 m west of the site the groundwater is of moderate vulnerability, while further east again groundwater is of high to extreme vulnerability.

3.4.3 Groundwater Quality

Groundwater beneath the site is part of the Dublin Groundwater Body (IE_EA_G_008) which, according to the WFD Ireland website, is classified as having 'Good' status and is characterised as being not at risk.

3.5 Natural Habitats and Protected Species

The Grand Canal, which lies just north of the site, is a pNHA (site code 002104) throughout its course.

South Dublin Bay, which is approximately 7.6 km east of the site, is also a pNHA and a SAC (site code 000210). South Dublin Bay, together with the River Tolka Estuary, forms a Special Protection Area (SPA) for birds (site code 004024).

Site Codes for each of these protected areas are provided in Section 3.3.1.

3.6 Regulatory Database Search

3.6.1 National Waste Collection Permit Office

The National Waste Collection Permit Office (NWCPO) website was reviewed to identify authorised waste facilities within the jurisdiction of Dublin City County Council that are also near the site. The NWCPO website indicated that there are two waste facilities within a 1 km of the site as summarised in Table 2 below.

Table 2 Dublin City Council Permitted Waste Facilities within 1 km of the site

Authorisation Number	Facility Name	Location	Waste Activity
WFP-DC-09-0008-02	Martin Services (Industrial) Limited	Unit 11 Bluebell Business Park Bluebell Dublin 12	Wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)
WFP-DC-11-0025-02	Rehab Enterprises Limited	The Rehab Building Kylemore Road Ballyfermot Dublin 10	Photographic film, mixed packaging and waste electronic equipment

3.6.2 Storm Water Discharges

Eight Irish Water storm water overflow discharge locations have been identified within 1 km of the site (on the southern side of the River Liffey), as summarised in Table 3 below.

Table 3 Storm Water Discharges

Emission ID	Name	Register No.
TPEFF0700D0034SW215	Ringsend	D0034-01
TPEFF0700D0034SW077	Ringsend	D0034-01
TPEFF0700D0034SW039	Ringsend	D0034-01
TPEFF0700D0034SW032	Ringsend	D0034-01
TPEFF0700D0034SW073	Ringsend	D0034-01
TPEFF0700D0034SW075	Ringsend	D0034-01
TPEFF0700D0034SW076	Ringsend	D0034-01
TPEFF0700D0034SW028	Ringsend	D0034-01

3.6.3 EPA IE, IPC and Waste Licensing

The EPA database of Industrial Emissions (IE) and Integrated Pollution Control (IPC) and Waste licences was consulted and no active licensed facilities were identified within 1 km of the site.

According to the EPA website there have been no reported environmental incidents within Dublin 4 from at least 2010.

3.7 Environmental Sensitivity

The overall environmental sensitivity of the site is considered to be moderate. Identified sensitive receptors within 1 km of the site include:

- The Grand Canal bounds the site to the north. Although this may be protected by low permeability clay (natural and/or engineered when the canal was constructed);
- The River Camac located approximately 600 m west of the site, although this may be protected by low permeability clay deposits which are likely to be encountered beneath the site; and
- The groundwater aquifer beneath the site, although this may also be protected by low permeability clay deposits, likely to be encountered beneath the site.

4. Source Audit Findings

4.1 Site Description

The site is situated adjacent to the Grand Canal along the Davitt Road and LUAS tracks in Drimnagh, Dublin 12. It is estimated that fluid loss from the cable was 300 litres up to that date when it was repaired in May 2003.

No visually evidence of impact from the cable fluid release was noted during the site walkover. The leak site itself and wider area is urbanized and generally paved, with the presence of green areas between the south bank of the canal and residential houses and a large yard composed by open ground located 50 m southwest of potential cable leak.

4.2 Surrounding Land Use

Land use in the immediate vicinity of the site is predominantly commercial with some residential, as summarised in Table 4 below.

Table 4 Adjacent Land Use

Site Boundary	Land Use
North	The Grand Canal is located immediately north of the site, on the adjacent side of the canal bank residential houses are located. The Goldenbridge Graveyard is located 100m northeast from the location of the leak.
East	Land use to the east of the site is a mixture of residential and commercial with large warehousing. The Drimnagh LUAS stop is located to the east.
South	The St John Bosco Youth Centre is located immediately south of the site, beyond which is predominantly residential housing.
West	Commercial units and light industry units run along the Davitt Road to the west.

4.3 Historic Site Review

4.3.1 Historic Maps and Aerial Photograph Review

A review of historical maps and aerial photographs available from OSI, Glucksman Map Library (Trinity College Dublin) and Google Earth was completed. A summary of the findings is presented in Table 5.

Table 5 Historic Map and Aerial Photograph Review

Year	Description
1829 to 1841 (OSI)	The site and the land to the south are undeveloped, as well as majority of land to the east and west. The Grand Canal is present. The land to the north is mostly developed with Richmond Barracks, a cemetery, an infant school along with several houses and cottages. There is a mill pond to the east of the site, to the west of the site there is a Quarry and Blackhorse Bridge. There is a road running southwest to northeast across Blackhorse bridge.
1898 to 1913 (OSI)	The site is still undeveloped as well as much of the land to the south. The Inchicore Railway Works is now present to the northwest of the site. The land to the north has become slightly more developed with houses being built along the road to the north of the site. St Joseph's industrial school is opposite the site across the Grand Canal. There has been some residential buildings along the southern back of the Grand Canal to the west.
1875 (1:10,560) trinity Maps	The site and the land to the south are undeveloped, as well as majority of land to the east and west. The Grand Canal is present. The land to the north is mostly developed with Richmond Barracks, a cemetery, an infant school along with several houses and cottages. The Inchicore Railway Works is located to the northwest of the site. There is a mill pond to the east of the site, to the west of the site a Quarry and Blackhorse Bridge. There is a road running southwest to northeast across Whitehorse bridge (renamed later as Blackhorse Bridge).
1908 (1:10,560) Trinity Maps	Whitehorse Bridge has been renamed as Blackhorse Bridge, there is more development of residential buildings to the north of the site near the Inchicore Railway Works. The land to the west, south and east remains undeveloped.
1943(1:10.560) Trinity Maps	There has been a large amount of development occurring in the land surrounding the site, to the south, west and east of the site is a large residential estate. The site remains undeveloped.
1968 (1:1,000) Trinity Maps	There is a youth hall to the south of the site, adjacent to the west of the site is a store. Davitt Road is named as the road running west to east along the southern back of the Grand Canal. Davitt House Flats is located to the southeast of the site.
1989 (1:1,000) Trinity Maps	There is no major changes from the previous map. There is an electrical substation located to the northeast beside Goldenbridge Cemetery.
1994 (1:1,000) Trinity Maps	There are no major changes from the previous map.
1995 (OSI)	Development of the surrounding area is shown on the 1995 aerial photograph. High density residential buildings are to the north of the site with commercial units and residential buildings to the south of the site.
2000 (OSI)	No significant changes

Year	Description
2005 (OSI)	The LUAS tracks now run parallel to the Grand Canal, no significant changes to the residential and commercial areas.

4.4 Potential Sources

4.4.1 Cable Fluid Source

Information on the potential fluid released was provided in the ESB RFP document. Typically, fluid filled cables are installed in trenches approximately 1.2 m deep, 1.1 m wide and the depth to the top of the cable is typically 0.9 m – 1 m. The cables are typically surrounded by 0.35 m of sand and then the trench is backfilled with either Clause 804 fill or trench arisings.

Based on information from the GSI, it is likely that the cable on this site is installed within sand and backfilled with made ground, therefore leaked fluid is likely to have migrated through either the sand surround or made ground (if of sufficient permeability).

It is estimated that 300 litres of cable fluid was released in May 2003. It is assumed, based on records provided to AECOM by ESB, that the fluid lost was 'T 3788' manufactured by H&R ESP Ltd of Milton Keynes in the UK. T 3788 is a low viscosity blend of linear alkyl benzenes (LABs), CAS # 67774-74-7.

4.4.1.1 Physical and Chemical Properties

LABs have side alkyl chains of 10-13 carbon atoms in length attached to a benzene ring. The alkyl chain may be attached to the benzene ring at any position except the terminal (end) position. As LABs are a mixture, their precise physico-chemical properties are dependent upon the components of the mixture, but they are generally colourless, oily liquids, less dense than water, with very low aqueous solubility and low volatility. Their potential spreading in the ground will therefore be similar to other light non-aqueous phase liquids (LNAPL) but with very little mass loss due to volatilisation or dissolution.

Information relating to the nature and toxicity of linear alkyl benzenes has been primarily sourced from the following documents:

1. Safety Data Sheet (SDS) for T 3788;
2. European Union Risk Assessment Report, Benzene, C10-13 alkyl derivatives, 20 June 1997; and
3. Organisation for Economic Co-operation and Development (OECD) Screening Information Datasets (SIDS) Initial Assessment Reports for High Production Volume Chemicals, United Nations Environment Programme, Chemicals Branch, May 2002.

Table 6 summarises the basic physical and chemical properties of LABs.

Table 6 Linear Alkyl Benzene Physical and Chemical Properties

Property	Description
Molecular Weight	239-243 g/mol
Melting Point	<-70^{o}C
Boiling Point	251-320^{o}C @ 1 atm (OECD)
Vapour Pressure @ 25^{o}C	6.5 x 10^{-5} kPa (OECD)
Aqueous Solubility	0.041 mg/L (OECD)
Henry's Law Constant	9.34 x 10^{-4} atm-m^{3}/mol (OECD)
Density	0.86 @ 20^{o}C
Flash Point	140^{o}C
Explosive Properties	None

LAB (C12) has a calculated octanol-water partition coefficient (Koc) of $2.2x10^4$ and is classified by the EU risk assessment as a high adsorptive substance.

4.4.1.2 Degradation

The OECD SIDS (2002) review concluded that LABs undergo “rapid primary biodegradation in natural waters and complete mineralisation by micro-organisms under aerobic conditions”. A measured half-life in water of four to nine days was reported. Microorganisms in sewage sludge and soil were reported to rapidly and completely biodegrade LABs. Anaerobic biodegradation was inferred to occur, but at a slow rate.

Degradation in soil is expected to occur but to be slower than in surface water due to the much slower mixing and the limited availability of oxygen. Where oxygen is available, aerobic degradation would occur at the fringes of a body of LNAPL in the soil/groundwater, producing elevated carbon dioxide levels in the soil and potentially elevated alkalinity in the groundwater.

In the absence of oxygen, anaerobic degradation may occur by methanogenesis or by reduction of sulphate, nitrate, ferric iron (Fe^{3+}) and manganese (Mn^{3+}). These processes could lead to reducing conditions in the groundwater, with depleted concentrations of sulphate (SO_4^-) and nitrate (NO_3^-) and increased concentrations of dissolved methane (CH_4), ferrous iron (Fe^{2+}) and dissolved manganese (Mn^{2+}). Such conditions would be expected to occur close to the LNAPL body and locally downgradient. With increased distance from the LNAPL, mixing with the surrounding groundwater and aeration from seasonal fluctuations and groundwater recharge would gradually allow ambient (most likely oxidised) conditions to be re-established.

4.4.1.3 Toxicity

According to the OECD review, LABs were assessed to be not acutely toxic to human health. Data from repeat exposure, reproductive and genotoxicity studies also indicated a low potential for toxic effects. The OECD concluded that “Linear alkyl benzenes do not present any significant acute or sub-chronic health effects by various exposure routes. LAB is not teratogenic (i.e. causing birth defects) and does not produce selective reproductive toxicity.”

Laboratory studies have shown that repeated exposure to LABs may be irritating to the skin, and the SDS recommends the use of gloves when handling LABs. The low vapour pressure of LABs limits the potential for exposure via inhalation, and this is not expected to be a significant exposure route at normal temperatures.

Eco-toxicity studies reviewed by the OECD found no acute toxic effects on aquatic species tested at concentrations up to and exceeding solubility limits. The only exception to this was for the water flea Daphnia magna. No data was available regarding terrestrial eco-toxicity studies.

Due to its high biodegradability and rapid metabolism, the OECD concluded that LABs were of little concern for adverse environmental impact. The OECD and EU review of LABs both concluded that LABs were a low priority for further investigation.

4.4.1.4 Conclusion

Based on the above, underground leakage of LABs is not likely to lead to significant issues from dissolved hydrocarbons or vapours. The main concern from LABs is expected to be the potential for them to migrate and spread as a LNAPL, downwards through unsaturated soil that is present and then laterally in the vicinity of the groundwater table. The extent of LNAPL migration will depend on the properties of the surrounding soil and on the saturation and pressure distribution within the LNAPL. These in turn would depend on the quantity of cable fluid lost and the timescale over which the leakage occurred. Vapour impacts are considered to be unlikely, but degradation of the cable fluid may lead to the generation of ground gas (including carbon dioxide and methane) and affect groundwater chemistry in the vicinity and locally downgradient of the LNAPL.

4.4.2 Potential Off-Site Sources of Contamination

Based on a review of historic maps and the current site setting, land use surrounding the site has been principally residential and commercial. The following potential off-site sources of contamination have been identified as part of the assessment works completed:

- Fill materials (understood to be up to 1.5 m bgl) present in the surrounding area;
- Historic industrial land uses in the vicinity of the site, including a brick works and paint factory;
- Goldenbridge Graveyard; and
- Fuel / chemicals (e.g. for back-up generators) present in commercial buildings around the site.

4.5 Source Audit Summary

Based on the assessment works completed, the primary Area of Potential Environmental Concern (APEC) for this site comprises the leak location identified by ESB. This is presented in Figure 2 and a description is provided in Table 7.

Table 7 Area of Potential Environmental Concern

Number	APEC	Potential Contaminants of Concern	Potential Media Impacted
1	Leak at (64) Inchicore – Poolbeg 220kV (May 2003)	LABs	Soil Groundwater Ground Gas

Other potential off-site sources have also been identified based on the type of activity. However, no information is available for these sites therefore the only APEC assessed herein is the leak site beneath Davitt Road, Drimnagh, Dublin 12.

5. Conceptual Site Model

A preliminary Conceptual Site Model (CSM) has been developed identifying potential contaminant sources, contaminant migration pathways and potential receptors.

In the context of land contamination, there are three essential elements to any risk:

- A **source** – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters;
- A **receptor** – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body; and
- A **pathway** – a route or means by which a receptor can be exposed to, or affected by, a contaminant.

Each of these elements can exist independently, but they create a risk only where they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway. This kind of linked combination of contaminant–pathway–receptor is described as a pollutant linkage. The preliminary CSM was developed to describe viable source-pathway-receptor (SPR) linkages for the site, which are presented in Table 12 below.

By considering potential SPR linkages, an assessment of the human health and environmental risks is made with reference to the significance and degree of the risk. The risk assessment has been undertaken with reference to BS10175-2011 + A2 2017 and CIRIA Document C552: 'Contaminated Land Risk assessment - A Guide to Good Practice' (2001).

The preliminary risk assessment completed for this site is based on consideration of whether a potential source of contamination can reach a receptor, and hence whether it is of major or minor significance. Considering that assessment works are still at preliminary stage and no intrusive investigation work has been completed, development of the preliminary CSM and assessment of potential risk is based on information provided by ESB on the nature of the leak, and on the AECOM site reconnaissance and desk based study. As such, only a qualitative assessment can be made around potential risks to receptors. This means that identification of potential risk does not necessarily indicate a risk to a receptor, rather that further assessment may be required to investigate assumptions made in the CSM and quantify whether a potential risk actually exists.

5.1 Qualitative Risk Assessment Methodology

A qualitative risk assessment has been carried out by assessing the severity of the potential consequence, taking into account both the potential severity of the hazard and the sensitivity of the target, based on the categories given in Table 8 below.

Table 8 Potential Hazard Severity Definition

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters.
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures.
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures.
Minor	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species.

The likelihood of an event (probability) takes into account both the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given in Table 9 below.

Table 9 Probability of Risk Definition

Category	Definition
High likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable.

The potential severity of the risk and the probability of the risk occurring have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard as shown in the table below.

Table 10 Level of Risk for Potential Hazard Definition

	Potential Severity			
Probability of Risk	Severe	Medium	Mild	Minor
High	Very high	High	Moderate	Low/Moderate
Likely	High	Moderate	Low/Moderate	Low
Low	Moderate	Low/Moderate	Low	Very low
Unlikely	Low/Moderate	Low	Very low	Very low

A description of the levels of risk outlined in Table 10 is provided in the following table overleaf:

Table 11 Description of the Classified Risks and Likely Action Required

Level of Risk	Description
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in substantial liability. Urgent investigation and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the long term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild, if realised.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

5.2 Preliminary CSM Assumptions

Based on the findings of the desktop study and information provide in the RFP by ESB, the following assumptions were made in development of the CSM:

- The fluid assumed (based on records provided) to have leaked from the cable is a Linear Alkyl Benzene (LAB), product T 3788;
- The geology beneath the site is assumed to comprise approximately 2.0 m of made ground underlain by clay up to a depth of 8 m bgl. Limestone bedrock is assumed to be present at a depth of approximately 8 m bgl;
- Groundwater was not reported in previous site investigations. Groundwater is assumed to be present within the made ground owing to the thickness of the stratum;
- It is assumed that there is no direct connection between the site and surface water bodies;
- Other below ground utilities including mains water are assumed to be present in the vicinity of the site; and
- It is assumed that industrial/commercial buildings adjacent to the site do not have basements.

The preliminary CSM is presented graphically in Figure 3.

Table 12 Conceptual Site Model

Source	Pathway	Receptor	Severity	Likelihood	Potential Risk	Discussion
LABs	Inhalation of vapours which have migrated from the ground to above ground buildings.	Site users in a commercial/low to high density residential scenario.	Mild	Low Likelihood	Low	LAB is assumed as the cable fluid used. The low vapour pressure of LABs limits the potential for exposure via inhalation, and this is not expected to be a significant exposure route at normal temperatures. Based on the volume of cable fluid released (300 litres), duration of time over which it was released (< 1 month) and time elapsed since the leak was repaired (17 years), it is considered that there is a low risk from the inhalation of vapours from potential LAB present beneath the site in this scenario.
LABs	Soil and dust ingestion from near surface soils. Dermal contact with near surface soils. Inhalation of fugitive dust from near surface soils. Ingestion of soils via consumption of vegetables grown in near surface soils.	Site users in a commercial/low to high density residential with plant uptake scenario.	Minor	Unlikely	Very Low	Given the likely depth to the cable, surface soils are unlikely to be affected and exposure via these pathways is not considered likely.
		Intrusive site workers.	Minor	Likely	Low	Given the relatively low toxicity of LABs (assessed to be not acutely toxic), and likely short duration and infrequency of such events, this pathway is not considered to represent a significant health risk.
LAB (NAPL)	Migration of ground gas generated from the degradation of the cable fluid to above ground buildings.	Site users in a commercial/low to high density residential scenario.	Medium	Unlikely	Low	If a significant source of NAPL (LAB) is present on groundwater, there is potential for ground gas to be generated from degradation processes. However, given the time elapsed since the leak occurred (17 years) and the relatively small volume of fluid released at this location (300 litres), it is unlikely that ground gas is being generated in significant quantities and potential risk from this pathway is considered to be low.
LAB (NAPL)	Permeation of LAB NAPL through plastic water supply pipes.	Site users in a commercial/low to high density residential with plant uptake scenario.	Medium	Unlikely	Low	Public water mains likely to be present in the vicinity of the leak, servicing commercial and residential properties have the potential to be impacted. However, the WHO drinking water guideline (DWG) for the relevant aromatic fraction[2] is 0.09 mg/l and as the solubility limit of LAB is 0.041 mg/L (OECD) i.e. less than the DWG, LAB cannot dissolve into the water supply above this level. Furthermore, water will be moving rapidly in the

[2] Petroleum Products in Drinking-water, Background document for development of WHO Guidelines for Drinking-water Quality, 2008

Source	Pathway	Receptor	Severity	Likelihood	Potential Risk	Discussion
						pipe under pressurised conditions making it unlikely to reach the solubility limit. ESB has consulted with Irish Water (statutory body responsible for water supply) regarding the potential risk for cable fluid present in the vicinity of water supply pipes. Following review of their records, AECOM understands that Irish Water do not have concerns regarding impact of water supplies from cable fluid leaks. It is therefore considered that the potential risk of a pollutant linkage being present is low.
LAB (NAPL)	Migration of potential contaminants along preferential flow pathways such as underground services and permeable backfill around the electricity cable.	Nearby surface water bodies including the Grand Canal and River Camac	Mild	Unlikely	Very Low	It is understood that the leak at this location was repaired in May 2003. Given the 17 year period since this leak was repaired it is likely that NAPL released from the cable has stabilised over the intervening period and the risk to surface water bodies is considered to be low.
LAB (NAPL)	Migration of potential contaminants along preferential flow pathways such as underground services and permeable backfill around the electricity cable, and consequently vapour inhalation and / or ingestion, dermal contact.	Site users in a commercial/high density residential with plant uptake scenario.	Minor	Unlikely	Very Low	Likely to be services present in the vicinity of the leak given the urban setting. As the soil / made ground around the leak is generally clay, the leaking fluid will likely have migrated mainly along any permeable backfill around the cable. The solubility of LAB is low and it is likely to absorb strongly to made ground and clay surrounding the leak location. In addition, the volume of fluid released was relatively low. Consequently, the potential for migration over significant distances is considered to be low.
LAB (NAPL)	Migration in saturated and unsaturated soil.	Groundwater beneath the site.	Mild	Low Likelihood	Low	Groundwater wells and springs are not indicated to be present within 1 km of the site, meaning the severity of potential impact would be considered mild. Due to its high biodegradability and rapid metabolism, the OECD concluded that LABs were of little concern for adverse environmental impact. Extent of LAB migration will depend on the characteristics of the receiving soil. However, given the volume of cable fluid released (300 litres) and duration since the leak was repaired (17 years) the potential risk of NAPL being present is considered to be low.

Source	Pathway	Receptor	Severity	Likelihood	Potential Risk	Discussion
Dissolved phase leaching from LAB NAPL or from soils containing LAB NAPL	Leaching from soil to groundwater. Vertical and horizontal migration of contaminants through groundwater. Horizontal migration of contaminants through groundwater to nearby surface water receptors.	Groundwater in superficial deposits beneath the site.	Mild	Low Likelihood	Low	Considering the low solubility of LAB, the relatively small volume released and the time elapsed since the release, the potential for dissolved phase impact from the presence of NAPL is considered to be low.
LAB (NAPL)		Groundwater in limestone bedrock aquifer beneath the site.	Mild	Low Likelihood	Low	Information on the local geology indicates the presence of underlying stiff clay, which would reduce vertical migration of groundwater to the bedrock aquifer.
		Nearby surface water bodies including the Grand Canal and Camac River	Mild	Low Likelihood	Low	The potential risk to surface water bodies is considered low given the relatively low volumes leaked over 17 years ago. The Grand Canal is likely lined with impermeable material. No evidence of impact from the cable fluid release was noted during the site walkover, with strong vegetation growth observed along the canal banks.

6. Conclusions

AECOM completed a Preliminary Site Assessment of a cable fluid leak location adjacent to the Grand Canal, Davitt Road, Drimnagh, Dublin 12. The objective of the works was to identify potential risks to human health and the environment that may be associated with a fluid leak from the identified location.

Based on the findings of the desktop study, the overall environmental sensitivity of the site is considered to be moderate. Identified sensitive receptors within 1 km of the site include:

- The Grand Canal bounds the site to the north. Although this may be protected by low permeability clay (natural and/or engineered when the canal was constructed);
- The River Camac located approximately 600 m west of the site, although this may be protected by low permeability clay deposits which are likely to be encountered beneath the site; and
- The groundwater aquifer beneath the site, although this may also be protected by low permeability clay deposits, likely to be encountered beneath the site.

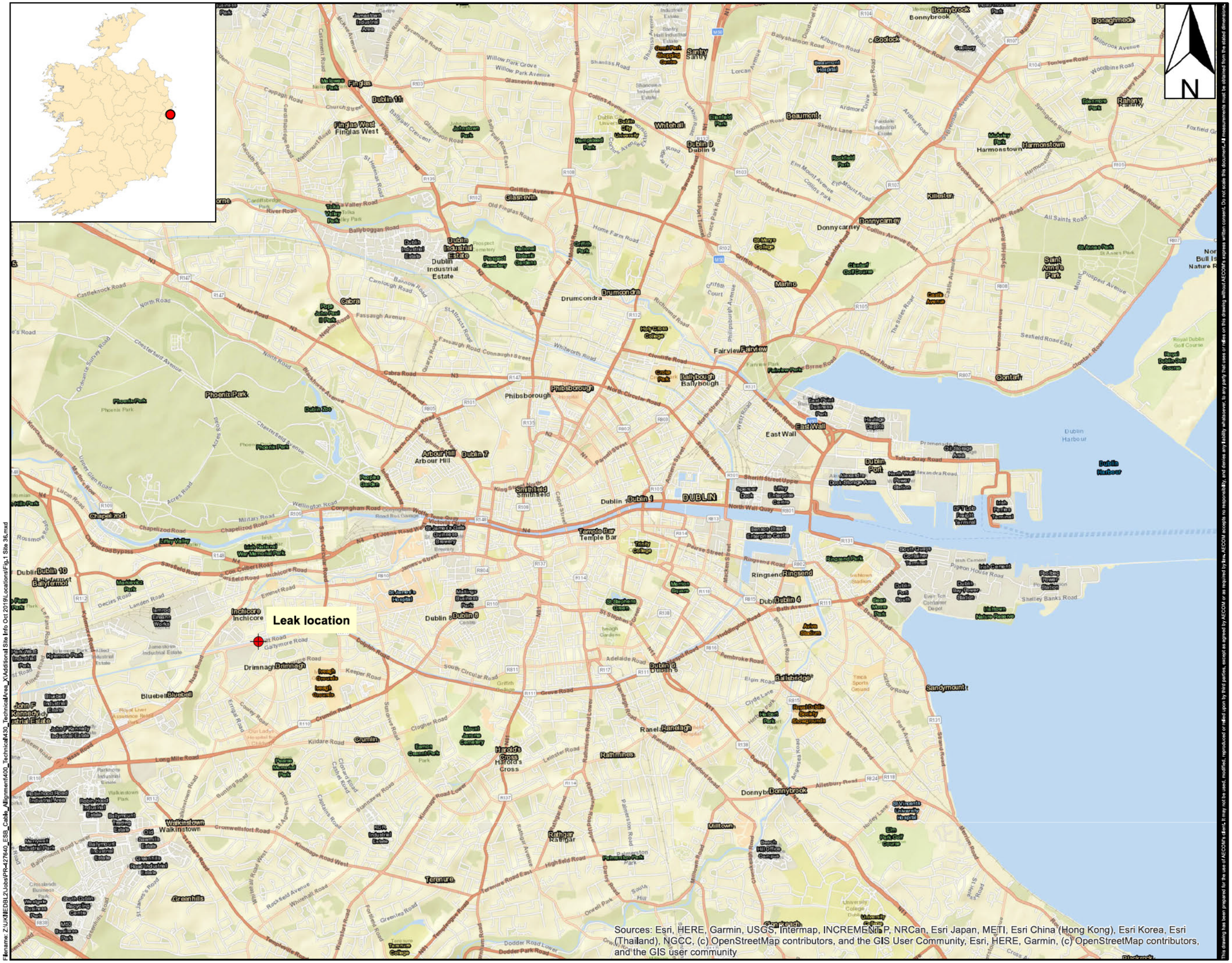
It is estimated that 300 litres of cable fluid (Linear Alkyl Benzene (T 3788)) was released in May 2003. Due to its high biodegradability, it is considered that LABs are of less concern for adverse environmental impact than other hydrocarbon fluids. A summary of the source audit findings is as follows:

Table 13 Area of Potential Environmental Concern

Number	APEC	Potential Contaminants of Concern	Potential Media Impacted
1	Leak at (64) Inchicore – Poolbeg 220 kV (May 2003)	LABs	Soil Groundwater Ground Gas

The preliminary CSM developed for the site looked at potential SPR linkages identified during the assessment works and found that potential risks were considered to be low. Based on these findings, further assessment is not considered to be required as no viable SPR linkages have been identified.

Figures



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Project Title:

ESB CABLE ALLIGNMENT
SITE 64
POOLBERG TWO
(220kV) INCHICORE

Client:

ESB

LEGEND

Leak Location

0 0.6 1.2 km

Notes:

AECOM Internal Project No:

60610407

Drawing Title:

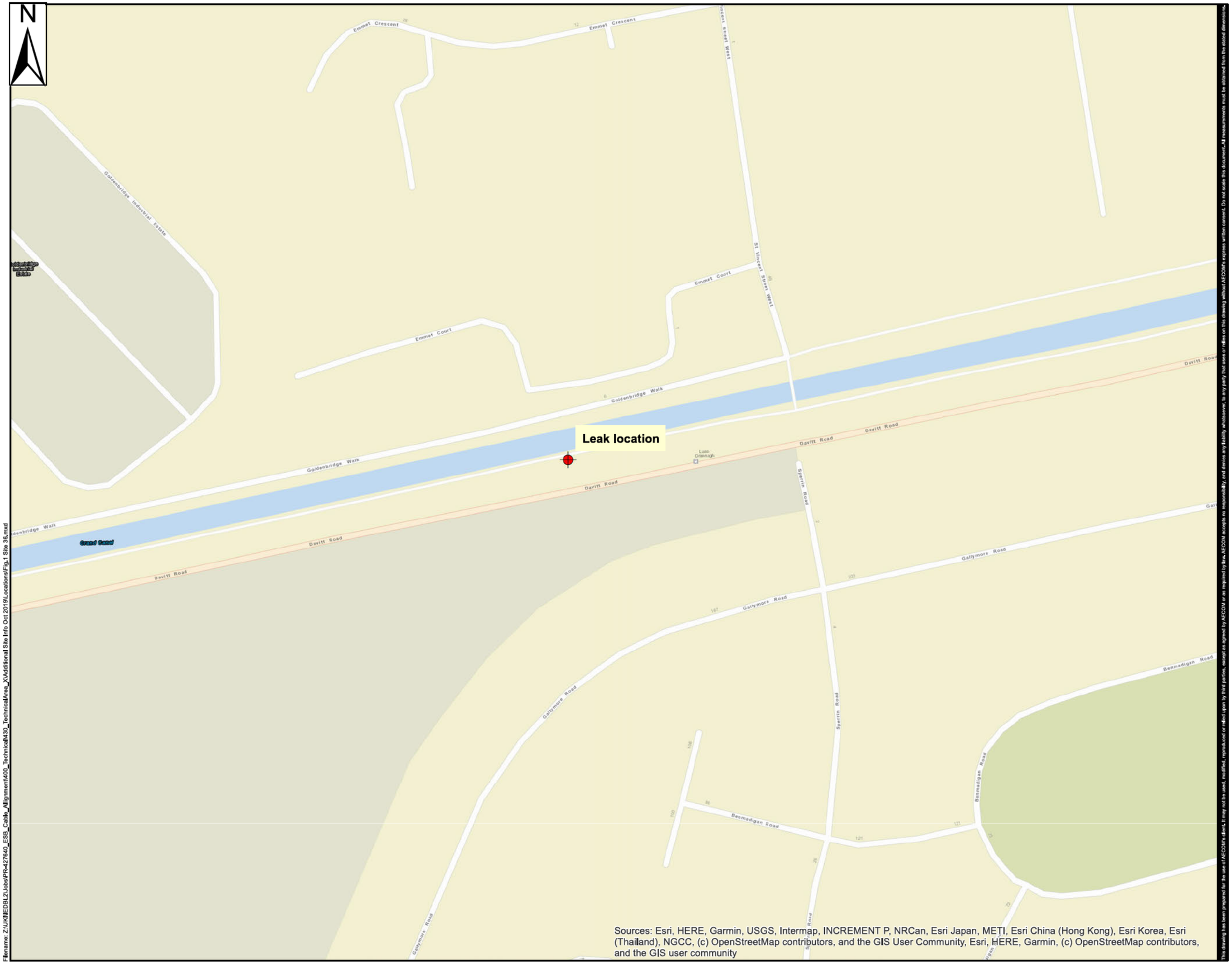
FIG.1 - SITE LOCATION

Drawing No:

FIG. 1

Drawn:	Chk'd:	App'd:	Date:
RE	DM	SF	18/10/19

Filename: Z:\UK\NEDBL2\Jobs\PR-427640_ESB_Cable_Alignment\400_Technical\430_Technical\Area_X\Additional Site Info Oct 2019\Locations\Fig.1 Site 36.mxd



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ESB CABLE ALLIGNMENT
SITE 64
POOLBERG TWO
(220kV) INCHICORE

Client:

ESB

LEGEND

Leak Location

0 25 50 m

Notes:

AECOM Internal Project No:

60610407

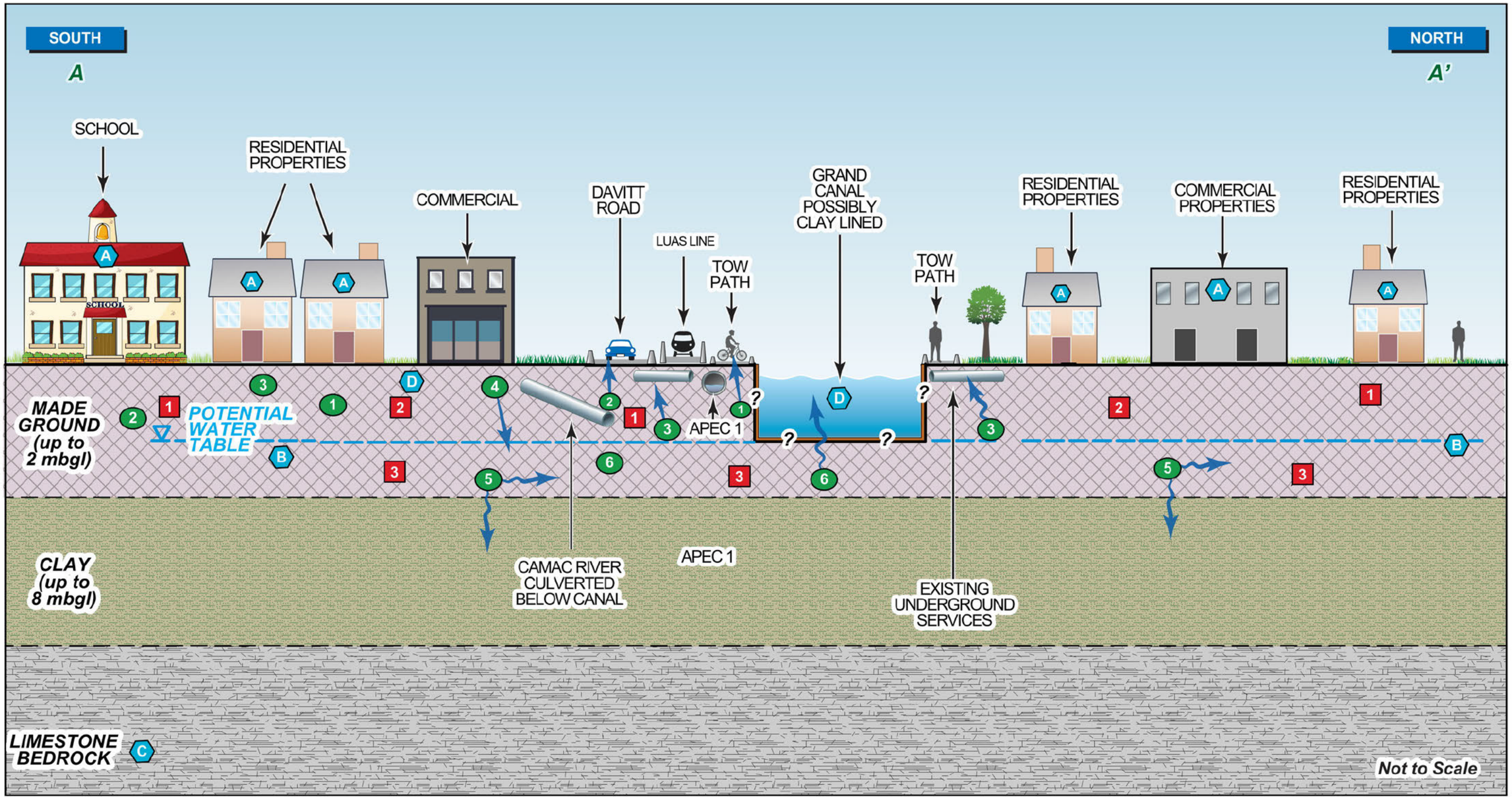
Drawing Title:

FIG.2 - SITE LOCATION

Drawing No:

FIG.2

Drawn:	Chk'd:	App'd:	Date:
RE	DM	SF	18/10/19



SOURCES	PATHWAYS	RECEPTORS
1 GROUND GAS	1 GROUND GAS MIGRATION	A RESIDENTIAL / COMMERCIAL SITE USERS
2 NON-VOLATILE CONTAMINANTS IN SOIL	2 DERMAL CONTACT / DUST INGESTION	B SHALLOW GROUNDWATER
3 CONTAMINANTS IN GROUNDWATER	3 PERMEATION OF AND MIGRATION ALONG EXISTING UNDERGROUND SERVICES	C BEDROCK GROUNDWATER
	4 LEACHING FROM SOIL TO GROUNDWATER	D SURFACE WATER
	5 VERTICAL & HORIZONTAL MIGRATION OF CONTAMINATED GROUNDWATER	
	6 MIGRATION & LEACHING TO SURFACE WATER	

Rev	Date	Detail	Made	Chk'd	App'd

Status: FOR INFORMATION

NOTES:

Client: Electricity Supply Board

Location: **SITE 64** Poolberg Two Inchicore 110 kV

Title: Fig.3 - Conceptual Site Model

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Design: RE	Drawn: RE		
Chk'd:	App'd: DM		
Date: DEC 2019	Scale: As Shown		
Project No. 60610407	Drg No. 3	Stat. .	Rev: 0

Appendix A Photographic Log

PHOTOGRAPH LOG

Facility Name:	Site Location:	Project No.
ESB Cable Assessment	Site 64 – Davitt Road	427640

Photo No. 1	Date: 01/11/19

Direction Photo Taken:

West

Description:

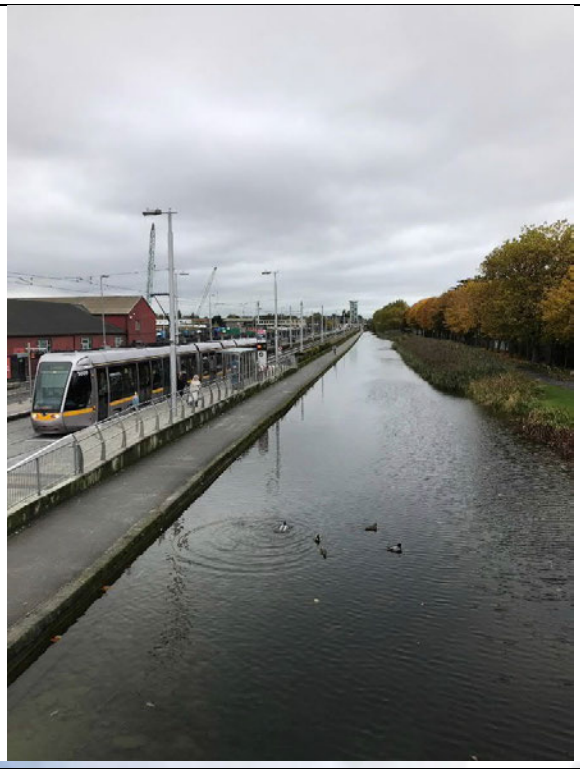
West-facing view showing the leak location. It is located along the pedestrian walkway (right). Green strips separate the pedestrian walkway from LUAS tracks.

Photo No. 2	Date: 01/11/19

Direction Photo Taken:

Description:

West-facing view showing the pedestrian walkway, grand canal, LUAS stop and tracks close to leak location.



PHOTOGRAPH LOG

Facility Name:	Site Location:	Project No.
ESB Cable Assessment	Site 64 – Davitt Road	427640

Photo No.	Date:
3	01/11/19

Direction Photo Taken:

Southwest

Description:

Large yard located approximately 30 m south west of leak location.

PHOTOGRAPH LOG

Facility Name:	Site Location:	Project No.
ESB Cable Assessment	Site 64 – Davitt Road	427640

Photo No.	Date:
4	01/11/19

Direction Photo Taken:

Description:

Shops including pharmacy, supermarket, bar located on Galtymore road, about 100 m south of leak location.

Photo No.	Date:
5	01/11/19

Direction Photo Taken:

Description:

Photo shows the water in the Grand Canal. No evidence of contamination was observed during the site visit.

PHOTOGRAPH LOG

Facility Name:	Site Location:	Project No.
ESB Cable Assessment	Site 64 – Davitt Road	427640

Photo No.	Date:
6	01/11/19

Direction Photo Taken:

South

Description:

Presence of a cemetery located approximately 250 m northeast of leak location.

PHOTOGRAPH LOG

Facility Name:	Site Location:	Project No.
ESB Cable Assessment	Site 64 – Davitt Road	427640

Photo No.	Date:
7	01/11/19

Direction Photo Taken:

South

Description:

Residential area located approximately 200 m southeast of leak location.

Appendix B PSA Template Report Table of Contents Cross Reference

EPA Template Table of Contents	Production Area Preliminary Site Assessment Report
Executive Summary	Executive Summary
1. Introduction	Section 1
1.1 Project Contractual Basis & Personnel Involved	Section 1
1.2 Background Information	Section 1.1
1.3 Project Objectives	Section 1.2
1.4 Scope of Works	Section 2
2. Source Audit Findings	Section 4
2.1 Current Site Operations	Section 4.1 to Section 4.2
2.2 Previous Site Operations	Section 4.3
2.3 Chemicals of Potential Concern	Section 4.4
3. Site Environmental Setting	Section 3
3.1 General Introduction	Section 3
3.2 Regional Geology and Hydrogeology	Section 3.2 and Section 3.4
3.3 Site Geology and Hydrogeology	Section 3.2 and Section 3.4
3.4 Summary of Previous Site Sampling and Monitoring Data	Not Applicable
4. Summary and Conclusions	Section 6
4.1 Summary and Conclusions	Section 6
4.2 Recommended Way Forward	Separate Cover Letter
5. References	Throughout Text