

Electricity Supply Board  
 One Dublin Airport Central  
 Dublin Airport  
 Cloughran  
 Co. Dublin

08 April 2020

**Our Reference**  
 PR-427640

## Preliminary Site Assessment - Site 45 Francis Street - Inchicore 110 kV

AECOM Ireland Limited (AECOM) completed a Preliminary Site Assessment (PSA) of a cable fluid leak on a 110 kV underground electrical cable running from Francis Street to Inchicore in Dublin City on behalf of Electricity Supply Board (ESB). The location of the leak is on the Grand Canal southern tow path adjacent to Blackhorse Bridge, Inchicore, Dublin 8. The PSA report was issued on 08 April 2020 (Report Ref. PR-427640\_ACM\_RP\_ENV\_057\_0). AECOM understand that ESB has undertaken these works on behalf of ESB Networks.

It is estimated that 8,435 litres of cable fluid was released between March 2005 and August 2007. It is assumed, based on information provided to AECOM by ESB, that the fluid lost was a mixture of LAB and mineral oil based products. Due to its high biodegradability, lower volatility and low solubility, it is considered that LABs are of less concern for adverse environmental impact than mineral oil based products. Given that there is potential for a mixture of both types of cable fluids to have been used at this site, potential contaminants of concern have been identified. A summary of the source audit findings is as follows:

### Table A Area of Potential Environmental Concern

Number	APEC	Potential Contaminants of Concern	Potential Media Impacted
1	Leak at (45) Francis Street – Inchicore 110 kV (March 2005 – August 2007)	LABs Total Petroleum Hydrocarbon (TPH) Benzene, Toluene, Ethylbenzene, Xylene (BTEX) Compounds Volatile Organic Compounds (VOCs) Semi-Volatile Organic Compounds (SVOCs) Polychlorinated Biphenyls (PCBs)	Soil Groundwater Soil Vapour Ground Gas

The preliminary CSM developed for the site looked at potential source-pathway-receptor linkages identified during the assessment works and identified a moderate potential risk to the following receptors:

- Site users due to the potential for ground gas generation resulting from degradation of NAPL (if present); and
- Shallow groundwater due to potential impact to groundwater chemistry from the presence of NAPL and associated biodegradation products.

A low to moderate risk was identified to site users from the potential for vapour migration from mineral oil based cable fluid.

A low to moderate risk was also identified to site users from the migration of NAPL and potential breakdown products along preferential flow pathways such as existing underground services.

Potential impact to the deeper groundwater aquifer was considered to be low to moderate due to the geology beneath the site.

Risks associated with other potential source-pathway-receptor linkages were considered to be low.

The PSA is preliminary in nature as it was based on an evaluation of qualitative data sources, meaning that identification of potential risk does not necessarily indicate a risk to a receptor, rather that further assessment may be required.

Given that potential risks were identified in the PSA, it is considered that intrusive site assessment is required to further assess assumptions made in the preliminary CSM and potential source-pathway-receptor (SPR) linkages. The findings of the PSA should form the basis of the scope of work for further detailed site assessment (DSA), and it is recommended that an iterative approach be adopted for intrusive assessment works. Given that the leak location has been confirmed, the first (exploratory) step in the DSA process would be to assess soil and groundwater conditions (as well as the presence of NAPL) through the excavation of slit trenches / trial pits in the vicinity of the leak location. A key aspect of these investigation points would be to expose the cable backfill materials to assess if they have acted as a migration pathway.

An indicative scope of work for the exploratory phase of the DSA is outlined as follows:

**Table B Indicative Scope of Work – Detailed Site Assessment**

Investigation Type	Indicative Number	Target Depth	Justification
Trial pit / slit trench	6	3 m bgl	Source Assessment - Assessment for the presence of contamination (including NAPL) in unsaturated and (if possible) saturated soil through collection of soil samples along the cable route, adjacent to and beyond the leak location. If possible, temporary monitoring wells could be installed into slit trenches to allow gauging of NAPL and completion of an indicative assessment of groundwater / soil vapour / ground gas quality.
Surface Water Monitoring	4	-	Receptor Assessment and Pathway Assessment – Collection of samples from the Grand Canal and Camac River upstream and downstream of the leak location to assess for potential impact to surface water.
Desk based	-	-	Pathway Assessment – It is assumed that the Grand Canal adjacent to the site is lined with a low permeability material such as clay, as was commonly used in the 1700s - early 20 <sup>th</sup> Century to prevent leakage from the canal and thus loss of water level restricting navigation. Further desk based assessment to confirmed construction of Grand Canal.

An outline schedule of laboratory analysis is provided as follows:

**Table C Preliminary Laboratory Schedule – Detailed Site Assessment – Exploratory Phase**

Parameter	Number of Soil Samples	Number of Soil Leachate Samples	Number of Groundwater Samples	Number of Surface Water Samples
TPH Criteria Working Group Analysis	12	6	2	4
Extractable Petroleum Hydrocarbons	12	6	2	4
BTEX Compounds	12	6	2	4
VOCs & SVOCs	6	6	2	4
PCBs	6	6	2	4

Parameter	Number of Soil Samples	Number of Soil Leachate Samples	Number of Groundwater Samples	Number of Surface Water Samples
Whole Oil Analysis	-	-	1 (if present)	-

Once the exploratory phase of the DSA is completed, recommendations can be made for further site investigation works required to assess potential SPR linkages identified as part of the PSA.

Yours sincerely,

[REDACTED]  
Associate Director  
AECOM Ireland Limited  
T: +353 (0)1 238 3100  
E: [REDACTED]@aecom.com