Casement Park is a contaminated site. Asbestos containing materials (ACMs) are widely present within the made ground on which the current facility has been constructed. If the site is redeveloped as a new 34,500 capacity stadium, the made ground would be excavated, resulting in disturbance of the ACMs. That disturbance risks the release of asbestos fibres, a cancer-causing material which would pose a serious threat to the health and wellbeing of residents living in the dwellings which abut the ground on three sides (the 'horseshoe' of Mooreland and Owenvarragh).

The presence of ACMs in the made ground of Casement Park dates back to the period following World War II. Prior to the construction of Casement Park as a GAA playing ground, the site was used as a landfill for dumping debris from the Belfast bombing blitz of World War II. According to the contractor (since deceased) who built the houses that now comprise Owenvarragh Park, because of all the toxic waste material that was dumped into the site, it would not be suitable for excavation. The only option was to further fill the site with appropriate backfill and make it into a playing field. That was duly done, and the site went on to become Casement Park, which opened on 14 June 1953 with a hurling challenge match between Cork and Galway.

Now, to the alarm of local residents, the GAA is proposing to fully excavate the site in preparation for the construction of a new stadium. As stated in the Environmental Statement (ES) submitted with the planning application for the redevelopment of Casement Park[1], that will entail "the excavation of approximately 110,000 cubic metres of soils, removing a large portion of the made ground from the site"[2]. The ES acknowledges the risk that excavation will release asbestos fibres[3]:

> "The main activity which may increase fibre release potential on the Casement Park site is the proposed earthworks. Significant earthworks will be required to create the proposed site formation level. The earthworks will involve excavation of soils using mechanical excavators which may break asbestos pieces into smaller pieces and give rise to soil borne dust."

As set out in the ES, the approach to mitigation of the excavation risks appears to depend mainly on spotting ACMs before they are broken, i.e. "screening of excavated soil to remove asbestos pieces will also be undertaken via mechanical screening and hand picking." That approach is not very assuring.

Such a major excavation of soils in which asbestos containing materials are known to be present is extremely concerning to local residents and those going about their business in the local area. If asbestos fibres were released during the excavation, they would not be confined to the construction site, but would be dispersed across the horseshoe and beyond. That is noted in the ES, which includes "off-site residential receptors" among those at risk from soil-generated dust containing asbestos[4].

However, asbestos risks are not confined to the excavation of the made ground. The development proposals include the demolition of the existing stands and buildings. But it is highly likely that asbestos containing materials are also present in the existing stadium stands and buildings. That is the conclusion to be drawn from the *Visual Asbestos Survey* reported in the GAA's Environmental

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[1] Application LA04/2017/0474/F, which can be viewed on the Northern Ireland Planning Portal at https://www.nidirect.gov.uk/services/planning-portal/.

[2] Para 4.2, Section 4 Development Proposals, RPS Remedial Strategy Report, Casement Park ES Volume III, Appendix 7.3, February 2017.

[3] Para 10.5, Section 10 Asbestos in Soil, RPS Generic Quantitative Risk Assessment, Casement Park ES Volume II, Appendix 7.2, February 2017.

[4] Table 14, Section 10 Asbestos in Soil, RPS Generic Quantitative Risk Assessment, Casement Park ES Volume II, Appendix 7.2, February 2017.

Statement[5]. Nonetheless, the Casement Park Environmental Statement does not appear to include a mitigation strategy for managing the demolition risks.

Furthermore, asbestos is not the only contaminant present in the Casement Park site. The soil sample results reported in the Environmental Statement also indicated the presence of toxic cancer-causing hydrocarbons, such as benzo(a)pyrene, as well as arsenic[6]. Carbon dioxide and methane were detected by gas monitoring on the site.

In addition, the development proposal includes the use of piling, with a total of 1,056 reinforced concrete bored piles. However, as stated in the Environmental Statement, "piling activities are likely to increase the risk of contamination being transported by creating new pathways" for dispersal of toxic materials[7]. Further, piling is not recommended in the Casement Park context (contaminated land underlain by an aquifer), but that is the 'cost-effective' solution!

The main concern with the proposed disturbance of contaminants on the Casement Park site is the risk to human health and safety. That is sufficient reason to leave the site undisturbed and cancel the proposed over-sized stadium.

In addition, if demolition and excavation were to commence, dealing with the contamination would certainly result in time delays and escalating costs. In the current climate, with the Northern Ireland Executive facing an £800 million budget shortfall, the financial costs of mitigating contamination in order to construct an over-sized new stadium are obscene.

KEY FACTS

Contaminants

Testing

The work undertaken in testing for contaminants is reported in the RPS report titled *Generic Quantitative Risk Assessment*, published as Appendix 7.2 in Casement Park ES Volume III. In 2016, 13 trial pits and 8 boreholes were used to collect 121 samples. It is reported that asbestos pieces were found in 33 of the samples (27%). The asbestos pieces were mainly found in locations around the perimeter of the current ground, i.e., in close proximity to residential dwellings.

No ACMs were reported to have been found in the six trial pits located on the pitch, albeit that does not necessarily mean that the made ground under the pitch is free of ACMs.

The terracing does not appear to have been sampled. The existing stadium buildings and stand also do not appear to have been tested; it would seem they were subject only to a visual inspection conducted in 2012. Consequently, it is possible that the extent of ACMs has been underestimated in the remedial strategy.

Soil contaminants

[5] Appendix A Visual Asbestos Survey 2012, RPS Remedial Strategy Report, Casement Park ES Volume III, Appendix 7.3, February 2017.
[6] For a summary of the contaminants of concern, see Section 2 Contaminant distribution, RPS Remedial Strategy Report, Casement Park ES Volume III, Appendix 7.3, February 2017.
[7] Piling Risk Assessment, Appendix B, RPS Remedial Strategy Report, Casement Park ES Volume III, Appendix 7.3, February 2017.

The contaminants summarised in Section 2 of the RPS Remedial Strategy Report (Casement Park ES Volume III, Appendix 7.3, February 2017), are as follows.

The following contaminants of concern were detected in soil samples taken at the Casement Park site:

- Polycyclic Aromatic Hydrocarbons (PAHs) – Naphthalene, Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(ah)anthracene.
- Metals – Arsenic.
- Asbestos.

Groundwater:

Elevated levels of a number of metals were recorded within samples taken across the site. Groundwater samples from the 2016 investigation recorded exceedances of the screening values for Mercury, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel, Selenium and Zinc. The likely source of these contaminants is leaching from Made Ground. Elevated levels of metals were detected within samples from the shallow groundwater and the deeper sandstone aquifer.

Ground gases and vapours

Gas monitoring results from 2012, 2013 and 2016 were combined and used to assess the gas condition on the site. Elevated concentrations of Carbon dioxide and Methane at MMWS05, MMWS07 and BH16-05 above 5% and 1% respectively resulted in the site being classified as Characteristic Situation 2 in accordance with CIRIA C665.

Development Proposals

As summarised in Section 4 of the RPS Remedial Strategy Report (Casement Park ES Volume III, Appendix 7.3, February 2017), the development proposals are as follows.

Demolition

The existing stadium stands and buildings will be demolished.

Earthworks

In order to facilitate the new development the proposed earthworks encompasses the excavation of approximately 110,000 cubic metres of soils, removing a large portion of the Made Ground from the site.

New stadium

A new stadium will be constructed on the re-profiled site. Piling will be required to support the new stadium.

Retaining walls

New retaining walls will be required around the boundary of the site, some of which will require piling.

Piling

A total of 1,056 reinforced concrete bored piles (continuous flight auger, CFA) are proposed for the site. These will vary in diameter between 600mm and 900mm and in length between 5m and 25m. A contiguous piled wall will be present along the northern boundary of the site, formed of 220 750mm diameter reinforced concrete bored piles to a depth of 6m. The remainder of the piles vary in diameter and depth across the site, with some areas developed upon a pad foundation.

The requirement for piling is summarised in the Environmental Statement as follows, in Appendix B of the RPS Remedial Strategy (ES Volume III, Appendix 7.3):

> "The geotechnical conditions within the development site indicate that a piled solution is necessary. Consequently, pilling activities are likely to **increase the risk of contamination** being transported by creating new pathways. In the absence of NIEA guidance, the Environment Agency **recommends that piling on contaminated sites underlain by aquifers is avoided where possible** and that non-invasive methods such as rafts should be used instead. Where there is no alternative to piling, a method should be selected that minimises the risks of groundwater pollution or gas migration." (Emphases added).

SOURCES

The Environmental Statement submitted as part of the planning application for the redevelopment of Casement Park can be viewed on the Northern Ireland Planning Portal at https://www.nidirect.gov.uk/services/planning-portal/.

The application reference number is LA04/2017/0474/F.

The key documents within the ES referred to above are as follows:

- Preliminary Risk Assessment, Volume III, Appendix 7.1.
- Generic Quantitative Risk Assessment, Volume III, Appendix 7.2.
- Remedial Strategy Report, Volume III, Appendix 7.3.