6.1 Chapter 6.1 Surface Water and Flood Risk

6.1.1 Introduction and Current Planning Situation

The geological setting, site boundary and planning application area remain unchanged from that originally assessed and approved. Quarrying operations within the footprint of the integrated waste management facility (IWMF) site has resulted in the phased and systematic excavation of overburden and sand and gravel reserves to the underlying London Clay; and the subsequent restoration operations has resulted in the placement of overburden materials within the IWMF site.

Within the Section 73 application and submission of details in July 2015, Honace provided its document "S2 – IWMF EIA update" now submitted with this Regulation 22 submission to the Planning Inspectorate within Appendix A2. Within that document, Appendix A "IWMF Process Overview" updates the proposed process description in the detailed design of the IWMF and clarifies the supportive water flows from New Field Lagoon into Upper Lagoon to support the IWMF's waste recovery, recycling and treatment operations.

In addition to the Section 73 application, in 2015, an up to date assessment was undertaken of all surface water baseline conditions and IWMF-related foreseeable developments within the detailed design of the IWMF under planning condition 23, which is stated as follows:

> ***Condition 23***: *"No development shall commence until a detailed scheme for surface water drainage and ground water management, including details of water flows between the Upper Lagoon and the New Field Lagoon has been submitted to and approved in writing by the Waste Planning Authority. The scheme shall be implemented in accordance with the approved details."*

The detailed design submissions for Condition 23 are contained herein immediately following this Chapter 6.1 within Appendix 6A (for Condition 23 Surface Water).

6.1.2 Original Assessment Surface Water and Flood Risk Assessment

As part of the original planning application a detailed review of flood risk was undertaken and required mitigation measures were formulated to ensure the proposed development was neither at flood risk nor increased flood risk to third parties. This assessment was undertaken using best practice guidance and was reviewed, and approved, by the Environment Agency and Essex County Council.

6.1.3 Updated Surface Water and Flood Risk Assessment – 2015

Given the minor modifications and changes made to the IWMF since the original application, Supporting Information S3 "Flood Risk – July 2015" (Appendix A3 with PINS submission) presents the update of the IWMF's surface water risk assessment by SLR Consulting that accounts for the changes in the building footprint and switch from vertical to soil nailed retaining walls. Based on the original surface water risk assessment completed by Golder Associates (UK) Ltd, the updated assessment 2015 confirms that the minor modifications presented within the Section 73 application have a negligible effect on the surface water and flood risk proposals in and around the Site. Indeed, the detailed design enhances surface water control.

6.1.4 Sources of Flooding

The original Flood Risk Assessment[1] assessed all sources of flooding in accordance with best practice[2] at the time the assessment was completed and in accordance with current best practice guidance[3].

The original assessment confirmed that the proposed development was at 'low' risk of flooding from river, tidal and coastal sources. Given the site location, and following review of current published flood mapping[4], the IWMF remains at 'low' flood risk from these sources.

6.1.5 Updated Surface Water Baseline - 2015

Within the original surface waste assessment the Flood Estimation Handbook (FEH, 1999) reported annual rainfall of 566 mm per year in the area of the Site. It was noted that the principal surface water features in the vicinity of the Site are the River Blackwater and the River Brain.

The average annual rainfall for this region of England is 577 mm, which is similar and more conservative than the average rainfall currently presented on the met office website for the period 1971 to 2000 for the nearby meteorological station of Wattisham (573.8 mm).

Therefore no adjustment of the annual rainfall data is required when considering the flood risk potential of the IWMF site from that originally assessed.

6.1.6 Updated Surface Water Assessment - 2015

The 'allowable' off-site rate of surface water runoff from site was limited to 5 l/sec/hectare. This is a commonly accepted rate of Greenfield runoff and one which remains valid. The required volume of storm water attenuation on site was calculated and it was confirmed that 20,481 m^3 of storm water storage would be required. The design storm event considered was a 24-hr duration storm with an annual probability of occurrence of 1% (e.g. the 100-yr event). A climate change allowance of 10% was included and added to the estimated rainfall in accordance with applicable guidance at that time (PPS25).

It is noted that current guidance (NPPF and PPG) also states that a 1% annual probability storm should be used for the design of drainage infrastructure. Current guidance also states that a 10% uplift in rainfall intensity should be applied for developments with a design life of up to 25 years e.g. the calculations presented in the original assessment remain valid and appropriate.

It is concluded, therefore, that drainage from the proposed IWMF area can be managed in accordance with the principles detailed in the original planning application, and without increasing flood risk to third parties.

As the detailed site design progresses further, the drainage principles would be agreed with the Environment Agency and Essex County Council in accordance with Condition 23 of the existing planning permission.

[1] Ground and Surface Water Assessment: Rivenhall Airfield eRCF, Golder Associates, August 2008.
[2] Planning Policy Statement 25 (PPS25): Development and Flood Risk, Defra, 2006.
[3] National Planning Policy Framework, (NPPF), Department for Communities and Local Government, 2012 and the Planning Practice Guidance (PPG), Department for Communities and Local Government, 2014.
[4] http://watermaps.environment-agency.gov.uk

6.1.7 Surface Water Lagoons

The surface water lagoons proposed at site (namely: Upper Lagoon and New Field Lagoon) will be designed and constructed in accordance with CIRIA Guidance[5] and where required the Reservoirs Act[6] and the Flood and Water Management Act[7].

Therefore, with appropriate mitigation and management, residual flood risks to the IWMF and off-site areas are expected to remain low as per the findings of the assessment.

6.1.8 Cumulative Surface Water Assessment

The planning application boundaries of the former Site A2 and existing Site A3 and A4 quarrying operations included the IWMF site to ensure that the 'Site Specific Issues to be Addressed' set out within Essex County Council's emerging Replacement Minerals Local Plan and adopted 2014 Minerals Local Plan were addressed, namely:

> *"Careful consideration must be given to the final low-level restoration contours to ensure the final landform blends with the surrounding topography and could blend with the levels and planting of the strategic waste management development (Ref ESS/37/08/BTE) if implemented."*

Furthermore, the 'preferred' Site A5 and 'reserve' Site A6 and A7 within the 2014 Minerals Local Plan are adjacent to or near the IWMF site. Therefore, there is a need to consider the cumulative impacts associated with the coincidental development of these schemes on the Site's surface water setting.

The plan for all minerals excavation is for work to be phased with rolling restoration, resulting in the delivery of low level restoration proposals.

The restoration proposals associated with Site A2 and Site A3 and A4 have resulted in an increase in the size of New Field Lagoon. The former overflow arrangements to Bradwell Pond (in the original application) are therefore no longer proposed; however, this will have a negligible effect on the overall catchment areas, surface water runoff and water quality. Consequently the cumulative surface water impact of/to any subsequent development will also be negligible.

Further consideration has been given to the surface water impacts associated with the installation of the proposed electricity cable and water abstraction and discharge pipelines within a shallow trench. Given the transient nature of the works and the limited influence that they will have on surface water and flood risk potential, the services installation works will have a negligible effect on surface water resources or the potential for flood risk.

Any abstraction point in the River Blackwater, would comprise an underground structure that would be constructed in accordance with any future Flood Defence Consent application which would have to be approved by the Environment Agency before any abstraction occurred.

Gent Fairhead & Co Limited's (GFC's) existing Abstraction Licence Serial Number AN/037/0031/001 permits a maximum annual abstraction of 250,000 m^3 from November to March inclusive linked to the Hands off Flow in the River Blackwater. The purpose of the abstraction licence is confirmed for the filling of reservoirs for the subsequent purpose of process water for waste treatment, processing and recycling.

[5] Design of Flood Storage Reservoirs. CIRIA Report B14, 1993 and Small Embankment Reservoirs, CIRIA Report 161, 1996
[6] Reservoirs Act 1975
[7] Flood and Water Management Act 2010

Abstraction and discharge licences are issued and regulated by the Environment Agency. The option to apply for a revised abstraction and discharge licence does exist and it is GFC's intention to submit an application shortly after this Regulation 22 submission. When an abstraction and discharge licence application is made, it would be subject to a detailed assessment by the Environment Agency. Any discharge application (for any UK site) has to comply with the European Water Framework Directive, whereby any discharge must not have a detrimental effect on the receiving bodies existing water quality (i.e. it must be to an equivalent or cleaner standard than the existing water course).

It is concluded that from a surface water and flood risk perspective, the cumulative EIA for the IWMF proposal and the wider foreseeable developments in and around the site has been considered and assessed, and no significant negative cumulative impacts have been identified.