Chapter 18 Assessment of Significance of Effects and Impact Interactions

18. Assessment of Significance of Effects and Impact Interactions

Introduction

18.1 Chapters 6-17 of this Environmental Statement have set out the findings of the overall Environmental Impact Assessment across a range of environmental topic areas. Table 18.1 overleaf tabulates the relevant direct and indirect interactions and interrelationships between each topic area and these are further articulated in this chapter.

18.2 Each of the chapters has described the aspects of the environment likely to be significantly affected by the development and assessed the likely residual impacts after mitigation measures have been taken into account. Each assessment has been undertaken both for the period of construction of the development and when it is built and operational.

18.3 This chapter considers the direct and indirect residual impacts and their significance **(positive, neutral or negative)** as well as any cumulative impacts that the development gives rise to whilst explaining the inter-relationships between the respective environmental factors.

18.4 Chapter 1 of this ES set out the statutory requirements governing the content of an ES. Part 1 of Schedule 4 of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2012 identifies matters for inclusion in an Environmental Statement, including:

"A description of the aspects of the environment likely to be significantly affected by the development including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors"; and

"A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development…"

18.5 This chapter seeks to review each of the 'technical' ES chapters in turn to ensure that the interrelationship between each of the aspects of the environment likely to be significantly affected by the development has been properly evaluated and considered and that the likely significant effects have been described appropriately.

Table 18.1 – Assessment of Significance of Effects and Impact Interactions Matrix

INTERACTIONS	6. Geology, Soils and Agriculture	7. The Water Environment	8. Land Quality	9. Ecology	10. Landscape and Visual Impact	11. Cultural Heritage	12. Transport	13. Noise	14. Air Quality	15. Climatic Factors	16. Population and Socio-Economic Impacts	17. Material Assets
IMPACT												
6. Geology, Soils and Agriculture												
7. The Water Environment	Y											
8. Land Quality	Y	Y										
9. Ecology	Y	Y	Y									
10. Landscape and Visual Impact	Y	N	N	Y								
11. Cultural Heritage	N	Y	N	Y	Y							
12. Transport	Y	Y	N	Y	Y	Y						
13. Noise	Y	N	N	Y	N	N	Y					
14. Air Quality	Y	N	N	Y	Y	N	Y	N				
15. Climatic Factors	N	N	N	N	N	N	N	N	Y			
16. Population and Socio-Economic Impacts*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
17. Material Assets	N	Y	N	Y	Y	N	Y	Y	Y	Y	Y	

Key
N – No Likely Direct and/or Indirect Impact
Y – Likely Direct and/or Indirect Impact
***including Health Impact Assessment (HIA)**

Chapter 6: Geology, Soils and Agriculture

18.6 Direct impacts as a result of the proposed development include a re-grading of the existing quarry shelves which will include rock extraction. In comparison to the level of extraction associated with the permitted quarrying activities at the site the impact of geology is considered to be **neutral**.

18.7 There will be temporary disturbance of soil and agricultural land during construction, after which affected areas will be returned to a similar condition to they are presently in. This impact is considered as slight adverse. The development is not considered to impact on animal health and whilst there will be some loss of agricultural land as a consequence of the proposed widening of Boghill Road the overall impact on agricultural output is considered to be negligible.

18.8 Indirect impacts flowing from impacts on geology, soils and agriculture have the potential to cause indirect and interactive impacts on other environmental factors including ecology, water environment, land quality, noise, landscape and population.

18.9 There will be a change to the current environmental condition as the site adapts from its presently permitted status as a quarry to redevelopment as a residual waste treatment facility. This will inevitably cause some change in the ecology of the site although the ecological assessment has concluded that where habitat is to be lost it is of low ecological value, with retention of a large majority of habitats considered of most value.

18.10 The application site is a working quarry which has significant aggregate capacity. As a working quarry it presents an already degraded appearance in the landscape. The re-grading and re-profiling enabling works to prepare the site for the proposed built development will cause only minor changes to how the site is perceived in the wider landscape.

18.11 From a construction perspective there will not be a requirement to import fill that would normally be the case with a development of this nature with on-site work to re-profile the site as opposed to regular transport movements into and out of the site carrying fill material. The change in land use from a working quarry to a residual waste treatment facility will have a net **positive** effect in terms of the impact on local population post-construction, by removing the need for blasting and the associated noise, dust and vibration that generates and will provide a defined level of operation as opposed to the fluctuating market demand level of activity and peaks of much higher HGV movement that have been associated with the quarry use.

Chapter 7: Water Environment

18.12 Mitigation measures have been identified to avoid construction practices that may have impacts on the water environment. It is considered that the impact on the water environment during construction, post-mitigation, in comparison with the present baseline quarrying operation context will result in a **neutral** impact.

18.13 The potential for surface water and groundwater impacts to occur has been considered and a range of mitigation measures devised including:

- A new SuDS system;
- Drainage designed with integrated trapped gullies and petrol interceptors;
- An Environmental Management System specifically devised for the site; and
- Construction practices identified for Boghill road widening works and bridge replacement works.

18.14 These will combine to ensure there will be a **neutral** impact on the overall water environment. A comprehensive construction management plan has been prepared and forms part of the ES (Appendix 3.1) and has been the subject of thorough review and reinforcement in response to comments received from NIEA Water Management Unit, NIEA Natural Heritage, DCAL Inland Fisheries, Rivers Agency and Six Mile Water Trust.

18.15 In terms of indirect impacts in assessing the water environment there are interactions with land quality, ecology, cultural heritage, transport, air quality, population and material assets aspects of the EIA process.

18.16 As explained in the EIA a key design factor on site is focused on potential pollutant removal, with silt traps and petrol/oil interceptors ensuring that surface water drainage which enters the SuDS Lagoon will be able to be held and discharged at greenfield run off rates to the Flush river. To ensure that there is control over the SuDS lagoon should an unforeseen event, such as fire, occur the lagoon will have a flow control valve placed on the outlet to ensure this can be closed and avoid any discharge to nearby watercourses pending clean up measures being instigated and de-contamination off-site as required. There will also be a series of measures taken during construction stage to avoid impacting local watercourses, as articulated in the Construction Management Plan.

18.17 Post mitigation measures being put in place it is considered that there will be no indirect impacts arising.

Chapter 8: Land Quality

18.18 No significant pollutant linkages have been identified from the risk assessments undertaken on-site.

18.19 There will however be specific project safety guidelines developed in accordance with the CDM Regulations to which there will be adherence without exception for all site workers.

18.20 The assessment has not identified any other factors that may give rise to concerns relating to cumulative land quality matters.

18.21 In terms of indirect impacts in assessing land quality, interactions exist with the water environment, geology, ecology and population.

18.22 The GQRA has demonstrated that land contamination is unlikely to be present on site which will have a material impact on human health or on the environment either during construction or when the proposed development is operational resulting in a **neutral impact**.

Chapter 9: Ecology

18.23 The proposed development is retaining a large majority of habitats, certainly those considered to be of most value within the application site with those being lost of low ecological value.

18.24 Many of the retained habitats will be subject to enhancement through new planting and appropriate management.

18.25 The presence of protected species has been noted with targeted mitigation and enhancements proposed in order to maintain their long-term favourable conservation status.

18.26 With regard to indirect impacts in assessing ecology, interactions exist with geology, soils and agriculture (changes to quarry rock face/profile); water environment (SUDs; replacement of bridges on Boghill Road; water monitoring) the landscape (Landscape and Biodiversity Management Strategy; landscape proposals plan; Boghill Road widening), cultural heritage (removal of bridges), transport (road widening), noise (impact on nesting birds), air quality (disposition) and material assets (aviation/bird hazard management plan).

18.27 There are considered to be no significant adverse residual effects in ecology terms resulting from the proposed development, allowing for mitigation. Overall, residual effects are considered to be minor **positive** at the site (invertebrates), local (birds), national (Smooth Newt) and European (bats) levels.

Chapter 10: Landscape and Visual Impact

18.28 The landscape and visual assessment of the site has involved a considerable body of work in understanding the existing baseline relationship of the quarry site and the wider landscape character as well as in understanding the landscape and visual effect of introducing the proposed built forms that collectively comprise the proposed development into the site.

18.29 The design approach has been focused on integrating these built elements within the existing quarry and wider utilitarian landscape and blending recessive building material colouration to minimise the prominence of aspects of the built elements in the wider landscape.

18.30 The proposed planting strategy, together with an on-going positive management regime, will lead to a further reduction in adverse effects on landscape character areas and have beneficial effect. Initial adverse impacts as a consequence of the widening of Boghill road will be offset by the establishment of a cohesive hedgerow structure in place of the gappy existing hedgerow.

18.31 Longer-term (year 20), the planting in the perimeter area of the quarry site will provide stronger integration of the quarry and the proposed built form into the landscape, resulting in a reduction in direct effects on the landscape character area of Divis Summits and indirect effects of the

visual influence of these features on Three and Six Mile Water Valleys**.** It is considered there will be a low magnitude of change in the character of Three and Six Mile Water Valleys resulting in residual **negative** effects of operation of minor-moderate significance.

18.32 In terms of interaction with other environmental factors there has been close integration between detailed design and finish of the buildings and landscape integration, as well as indirect impacts on geology, soils and agriculture (Boghill Road widening) ecology (landscape proposals and habitat areas), transport (road upgrade), cultural heritage (removal of bridges); air quality (plume visibility), population (landscape integration and visual impact) and material assets (assess the public right of way, height of stack and pylons). Positive management of both is an important on-going factor and the landscape design has been informed by ecological considerations and vice-versa.

Chapter 11: Cultural Heritage

18.33 There is always potential for disturbance of previously unknown cultural heritage resources although this is lessened given the nature of the quarry site.

18.34 The majority of known archaeological features identified as part of the EIA process are not located near to the development site.

18.35 There will be a permanent impact due to the need to demolish Black's Bridge to facilitate the Boghill road widening. This bridge has been identified as an industrial heritage feature but detailed specialist assessment has demonstrated that it is of limited historical interest.

18.36 Indirect impacts include potential effects on the water environment (replacement of Blacks Bridge) landscape (replacement of bridge), ecology as a consequence of the demolition of the bridge and the construction works associated with the proposed replacement bridge. Mitigation measures have been described in the CMP (Appendix 3.1) and in Chapter 7 relating to the construction approach that will be employed to avoid any adverse impact.

18.37 No cumulative cultural heritage impacts will occur resulting in **neutral impact**.

Chapter 12: Transport

18.38 The transportation impact of the proposed development has been informed by a considerable database of existing waste transport movement, including the source of Council depots and the frequency and tonnages associated with waste that presently goes to landfill, all articulated within a detailed Transport Assessment that forms Appendix 12.1.

18.39 That data has enabled an accurate picture to be presented of the current movements on the road network to the nearby Cottonmount landfill facility. Whilst the level of movement to Cottonmount has adjusted during the preparation stages of the Environmental Statement, due to changes in contractual situations, the transportation assessment has been updated to allow for sensitivity analysis to consider the effects of these changes, to examine revised 2013 flow data to replace previous counts taken in 2010 and to robustly assess the changes in traffic on the network that will arise as a consequence of the development.

18.40 Information relating to the extent of activity on the established quarry site has also been examined, accumulated from weighbridge data maintained at the site over many years of use up until the construction downturn (1999-2008).

18.41 Both of these datasets has enabled a comparative exercise to be undertaken to establish the net changes on the road network when the land use at the site adjusts from a permitted quarrying operation to a residual waste management facility.

18.42 When the site is operational the transport assessment has demonstrated that the impact on the transport network will show no tangible reduction in highway performance as a result of development traffic. The impact of the proposed development on transport issues is therefore assessed as **neutral**.

18.43 During construction there will be localised road closure and traffic management to facilitate widening of Boghill Road. This will be a temporary and short-term impact of moderate significance.

18.44 In terms of indirect impacts these relate to potential effects on ecology (loss of hedgerows and agricultural land), landscape (Boghill road widening), water environment (construction of bridges and approach as articulated in Construction Management Plan), noise (construction and operational traffic), air quality (construction and operational traffic emissions), population (traffic movements and routes; construction impact associated with Boghill Road widening) and material assets (traffic management).

18.45 There has been consideration given within and between each of the above ES chapters to the potential indirect impacts of transport. That may include, for example, potential disposition of waste material from waste trucks travelling to and from the site, odour from waste loads within the trucks and the impact of HGV traffic travelling past residential and business properties in terms of noise generation and air quality.

18.46 All trucks and related HGV traffic bring waste to and from the site will be required to be covered which will ensure that indirect impacts in terms of aerial disposition, scavenging birds and odour will be controlled.

18.47 Indirect impacts are therefore considered to be of **neutral** significance.

18.48 The Transportation assessment has considered growth in traffic on the highway network, including future years. As such a robust assessment is provided and potential highways cumulative impacts assessed.

Chapter 13: Noise

18.49 Cumulative impacts can occur if noise from the proposed development would add significantly to background noise levels at nearby receptors (population). In the vicinity of the application site, the noise climate at present is generally quiet, although that must be considered against the permitted quarrying operations that could be scaled up to full production to meet market demand at any moment.

18.50 Chapter 13 provides consideration of the detailed noise assessment that has been undertaken. It compares predicted noise levels against measured background readings to assess the likely degree of impact.

18.51 The assessment of cumulative impacts arising from the various aspects of the residual waste management facilities, including EfW and IBA maturation and processing has been undertaken.

18.52 In terms of indirect interactions this is considered to embrace geology, soils and agriculture (site enabling works), population (construction and operational noise), transport (impact on receptors and road noise during construction and operation) and ecology (impact of nesting birds)

18.53 The residual effects of the operational plant are assessed as being slightly adverse and of minor significance on the basis that it will be audible albeit at a low level, at the nearest noise sensitive receptor. In terms of construction noise the impacts are considered to be no worse than when the site operated daily as a quarry. There will be short term adverse impacts associated with Boghill Road widening.

18.54 There is a clear **positive** impact insofar as continued use of the site as an operational quarry to respond to market demand presents the prospect of continued blasting and related operational noise on site and significantly higher numbers of daily HGV flows into and out of the site as has been evident in the site movement history (1999-2008). The proposed development has a design capacity which will establish a defined level of traffic in and out of the site and will remove the blasting as it will cease to be an operational quarry.

Chapter 14: Air Quality

18.55 The comprehensive air quality modelling identifies a slight deterioration in local air quality due to emissions from the EfW, with these constrained to ensure they comply with the environmental standards required by the Waste Incineration Directive. There will be no breach of any Air Quality standard or impact on human health or the environment as a consequence.

18.56 The managed nature of the operations on site, with all waste arisings being treated within a controlled air pressure environment in enclosed buildings and all transported waste arriving in covered vehicles and containers will ensure that there is only a very small risk of odour nuisance associated with the facilities' activities resulting in a **neutral impact**.

18.57 There is potential for a slight deterioration in air quality as a consequence of the greater number of vehicles being generated by the proposed use of the site in comparison to the average vehicle flows associated with the quarrying operation. Whilst this is a slight exceedance, air quality will remain well within national air quality standards after the development is built and is operational.

18.58 Indirect air quality effects include potential to impact upon geology (dust from construction), ecology (disposition modelling against sensitive habitats) climatic (comparative benefits to

landfill), landscape (plume visibility), transport (vehicle emissions), climatic factors (enhancement v. landfill) and population (air quality standards and health).

18.59 The air quality assessment data has been specifically considered as part of the ecological impact assessment and no issues of significance arise. The climate chapter has modelled the environmental enhancement that will occur through treating waste in the proposed facility as opposed to landfill. The modelling relating to plume visibility has been addressed within the landscape and visual impact assessment. The transport assessment and air quality chapters interact with the volumes and nature of vehicle trips to the site during construction and when the site is operational assessed. The Health Impact Assessment appended to the population chapter (Appendix 16.2) has been informed by all of the above matters including consideration of risk perception as perceived by members of the local community who attended the ten public consultation sessions in March-May 2013.

18.60 Similarly, whilst there is a slight deterioration in air quality from EfW emissions and vehicle emissions (compared against average previous HGV quarry movements) collectively there is no human health or environmental impact of any significance that will arise.

Chapter 15: Climatic Factors

18.61 The proposed development will make a significant long-term beneficial environmental contribution to greenhouse gas reduction as a direct consequence of managing the waste through MBT and EfW rather than continuing with landfilling.

18.62 A commonly used model called WRATE, standing for waste and resources assessment tool for the environment, has been used to compare the existing baseline scenario whereby all contract waste is sent to landfill against the propose solution of co-located MBT and EfW.

18.63 Direct and indirect interactions are with population, material assets, ecology and air quality.

18.64 This demonstrates that there will be considerable **positive** benefit across a range of critical indicators including global warming potential, human health, acidification, eutrophication, resource depletion and accurate ecotoxicology. There will be an overall net benefit of some 57,474 tonnes of C02 Eq per annum.

Chapter 16: Population/Socio-Economic

18.65 The proposed development will generate very significant economic benefits to the local and regional economy given the large scale of the investment involved and the enhancement to spending power created during the 41 month construction period and when the facilities are operational. These impacts will be **positive**, short and long-term and their significance would be substantial.

18.66 During the early stage of the construction programme there will be disruption caused by the closure of part of Boghill Road to facilitate its widening, which will inconvenience users of this road for approximately a three-four month period. This will be a short-term temporary impact which will have slight-moderate significance. On completion of the widening works in the

longer-term there will be a net beneficial effect given the enhanced road corridor and the more cohesive hedgerow structure that will be introduced in place of the gappy hedge that presently exists.

18.67 The diversion of waste presently going to landfill to the MBT and EfW at Hightown will reduce the potential threat to aviation safety as a consequence of waste being processed within enclosed buildings and being transported under controlled conditions with each truck and container covered. The threat to aircraft from bird strike due to a concentration of scavenging birds will therefore be significantly reduced and there will be a net **positive** long-term cumulative benefit that will be substantial. A bird hazard management plan has been prepared and agreed in responding to aviation safeguarding concerns raised specifically by Belfast International Airport to set safeguards in place for operational practices on the site.

18.68 The development of a modern residual waste management facility at Hightown will also have significant **positive** effects in terms of the enhancement in health and safety terms that the modern processing will have in comparison to landfill. This will be a **positive**, long-term impact of substantial importance.

18.69 In terms of health and well-being, a human health risk assessment and a health impact assessment have been undertaken. The first is a technical exercise that specifically addresses emissions. The HIA looks more closely at the perceived risk to health and concerns the population may have. Both have demonstrated that there will be no breach of any standard relating to human health or the environment as a consequence of the development.

18.70 In terms of interaction with other factors, matters relating to geology, soils and agriculture, landscape and visual impact, land quality, the water environment, noise, transport, air quality, odour, climatic, ecology and material assets (diverting waste from landfill) have all been addressed to ensure that the significance of environmental effects on population have been comprehensively addressed.

Chapter 17: Material Assets

18.71 This chapter has examined a number of wider physical and non-physical aspects of the environment including utility infrastructure (electricity, gas, and water), telecommunications and aviation safety.

18.72 Direct impacts are considered to be short-term in duration and confined to the construction stage of the project.

18.73 There will be some disturbance caused by the undergrounding of the electricity grid connection that will require traffic management measures to be implemented by the statutory undertaker as part of a separate process but in the longer-term there will be a substantial net **positive** effect with electricity being generated from sustainable thermal treatment of waste that otherwise goes to landfill. That generation will be the equivalent of powering some 30,000 homes.

18.74 As described above there will be a net **positive** impact on aviation safety as a consequence of the development and the significant reduction in waste to landfill which could otherwise increase the risk of bird strike.

18.75 In terms of interaction with other environmental factors there has been consideration given to issues relating to rights of way in the landscape, ensuring measures are taken in the SuDS lagoon to reduce the attractiveness to birds (ecology) and potential impact to housing and business properties (water environment, population; transport; noise; air quality and climatic factors).

Conclusion

18.76 Taking all the chapters together, the interaction between environmental factors have been considered, potential environmental effects identified and the significance of these described.