DRAINAGE IMPACT ASSESSMENT ADDENDUM

SOAY SOLAR FARM AND GREENER GRID PARK

STATKRAFT UK LTD

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Prepared By:
Arcus Consultancy Services

1C Swinegate Court East, 3 Swinegate, York YO1 8AJ
T +44 (0)1904 715 470 l E info@arcusconsulting.co.uk
W www.arcusconsulting.co.uk
Registered in England & Wales No. 5644976

1 INTRODUCTION

Arcus Consultancy Services Limited (Arcus) produced a Drainage Impact Assessment (DIA) on behalf of Statkraft UK LTD in November 2021 as part of the planning application (the Application) (Planning Reference: 21/04505/STPLF) for a proposed Solar Farm and Greener Grid Park (the Development) at Thornton, near York, East Riding of Yorkshire (the Site), approximately centred on National Grid Reference SE 76204 46514.

The original DIA (dated November 2021) was submitted as part of the Application in December 2021, following which the layout and technical details of the Development have been amended to incorporate minor design changes.

Due to design minor design changes associated with the Development, Arcus have been appointed to produce a DIA Addendum to outline how surface water will be managed during the operation of the Development in relation to the revised layout (July 2022) and conclusions of the Original DIA.

This DIA Addendum is to be read in conjunction with the Original DIA.

2 UPDATED DRAINAGE IMPACT ASSESSMENT

2.1 Solar Farm

The extents and nature of the solar elements of the Development will not significantly differ from the plans assessed within the Original DIA. Installation of the PV arrays does not involve the introduction of hardstanding at ground level, meaning the superficial cover for the solar elements of the Development will remain the same as the baseline.

Acknowledging the limited impermeable areas to be constructed, the solar development will comprise of surface water management techniques to control runoff based on Rural Sustainable Drainage Systems (RSuDS)[1]. Such measures will manage surface water within the Site through interception and absorption via natural mechanisms in order to drain the Site as per the existing scenario.

To limit possible channelisation from surface water from PV arrays and promote interception and infiltration potential throughout the solar elements of the Development, the grounds surrounding and between the PV Arrays will be planted with native species rich grassland mix which will act as dripline planting. This will allow surface water, which falls from the drip line across the face of the PV arrays, to be intercepted by the vegetation and limit the potential of surface water to concentrate and run across the surface and into the surrounding hydrological network.

Existing ground conditions at the Site vary, with areas of the Site identified as bare ground associated with agricultural use during the site walkover undertaken by Arcus in April 2021. Planting the ground with native species-rich grassland will provide additional friction relative to the existing conditions at the Site, which currently have potential for surface water to flow with limited interception.

During the site walkover, a series of scrapes were identified across the Site, located across the perimeter of existing fields at low lying areas. Such scrapes were not shown to be connected and contained no features, with vegetation located within some scrapes. To intercept surface water runoff from the solar elements of the Development the existing swales will be utilised and extended where required. With the negligible increase in surface water runoff associated with the solar development, the proposed extension of scrapes will provide additional surface water storage capacity relative to the baseline scenario.

[1] EA (2012) Rural Sustainable Drainage Systems [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291508/scho0612buwh-e-e.pdf (Accessed 05/07/22)

To limit the potential flows of surface water within the proposed scrapes, check dams will be implemented within scrapes throughout the operational phase of the Development, limiting the potential of surface water to settle in low lying extents of the scrapes.

The location of proposed scrapes and extended scrapes are shown in Appendix H of the Original DIA.

East Riding of Yorkshire Council (the Council) as the Lead Local Flood Authority (LLFA) have agreed to the above methodology during consultations, as shown in Appendix E of the Original DIA.

2.2 Greener Grid Park

The Greener Grid Park (GGP) will be located across two locations; to the east of Field Q and to the west of the existing National Grid substation, as shown in Appendix A of this Addendum.

The proposed access tracks associated with the Development will comprise of permeable materials (e.g., Type 2 aggregate) and are therefore excluded from the total impermeable areas.

The impermeable areas associated with the Development assessed within the Original DIA and the revised layout (July 2022) are summarised in Table 1.

Table 1: Hardstanding Areas Summary

Layout Version	Location	Hardstanding Infrastructure	Hardstanding Area(m^2)	Total Hardstanding (ha)
Previous Layout (November 2021)	East of Field Q	400kV Transformers (blue on Layout)	417	0.273
		Auxiliary Transformers (purple on Layout)	96	
	Adjacent to Existing Substation	Energy Management System Building	1228	
		400kV Transformers (blue on Layout)	834	
		Auxiliary Transformers (purple on Layout)	96	
		Diesel tank for emergency back-up generator	60	
Revised Layout (July 2022)	East of Field Q	400kV Transformers (blue on Layout)	417	0.244
		Auxiliary Transformers (purple on Layout)	96	
	Adjacent to Existing Substation	Energy Management System Building	1228	
		400kV Transformers (blue on Layout)	556	
		Auxiliary Transformers (purple on Layout)	80	
		Diesel tank for emergency generator	60	

As the impermeable areas associated with the Development will decrease relative to the previous layout (November 2021), the existing attenuation pond design will be utilised. As such the surface water runoff rates associated with the Development will decrease and the use of the existing ponds will provide additional attenuation capacity.

The impermeable areas associated with the previous layout (November 2021) were also to be served by a SuDS system which utilised surface water attenuation ponds at the GGP east of Field Q and west of the existing National Grid substation.

The network comprises ponds with flow restriction devices installed in order to attenuate and discharge surface water at the IDB approved rate of 1.4 l/s/ha without surcharge during a 1:100 (+40 % CC) year pluvial event.

The GGP east of Field Q will discharge surface water to the land drain to the south, which currently serves the Site via the wider drainage catchment[2] and is shown in Appendix C of the Original DIA.

The GGP adjacent to the existing National Grid substation will discharge surface water to the land drain to the south, which currently serves the Site via the wider drainage catchment and is shown in Appendix C of the Original DIA.

3 CONCLUSIONS

The previous layout (November 2021) submitted with the Application has been updated to incorporate minor design changes which do not result in any significant change in flood risk vulnerability.

The surface water runoff associated with the solar part of the Development will be managed by RSuDS measures, including the dripline planting, leaving grounds to vegetate and the extension of existing and implementation of scrapes across the Site.

The SuDS system outlined in the Original DIA will be utilised. This system comprises two ponds, with flow restriction devices, which will attenuate surface water associated with the GGP Development without surcharge during a 1:100 (+40 % CC) year pluvial event, as demonstrated by outputs from Micro Drainage.

The reduction in impermeable surfaces relative to the previous design will provide additional surface water management benefit.

[2] UK Centre for Ecology and Hydrology (2021) FEH Webservice Handbook Map [Online] Available at: https://fehweb.ceh.ac.uk/GB/map (Accessed 05/07/22)