ENVIRONMENTAL STATEMENT – VOLUME 3 – APPENDIX 14.1

Primary Mitigation and Preliminary Assessment of Likely Significant Effects

Drax Bioenergy with Carbon Capture and Storage

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations, 2009 – Regulation (5(2)(a))

Document Reference Number: 6.3.14.1

Applicant: Drax Power Limited

PINS Reference: EN010120

REVISION: 01

DATE: May 2022

DOCUMENT OWNER: WSP UK Limited

AUTHOR: A. Curry

APPROVER: S. Hands

PUBLIC

TABLE OF CONTENTS

TABLES

1. PRIMARY MITIGATION

Table 1.1 - Primary Mitigation

Climate Hazard	Associated Hazard	Receptor(s) affected	Potential Impact	Mitigation
Precipitation	Changes in annual average precipitation Extreme precipitation events	Carbon Capture Plants Existing infrastructure Ancillary works Habitat Provision Area	Flooding of the Carbon Capture Plants and supporting infrastructure Damage to structures within the Order Limits from increased run off Drainage infrastructure overwhelmed leading to surface water flooding of the site and / or the surrounding land / properties Damage to structure from increased run off Longer growing season, more vigorous vegetation growth in spring and autumn requiring more frequent maintenance Changes to ground conditions from flooding or drought causing subsidence and changes in soil moisture. Windborne dust and debris clogging drainage channels and requiring clearing Flooding of the Habitat Provision Area	Surface water runoff will be utilised in the existing cooling water system - it will reduce the amount of water abstracted from the River Ouse for cooling process. Considering the limited space within Drax Power Station, the existing surface water drainage will be utilised whenever it is feasible. The nature and volume of discharge from Drax Power Station Site will be within the existing permit limits. For further details on flood risk and drainage mitigation please refer to the Flood Risk Assessment and Surface Water Drainage Strategy.
Temperature	Extreme temperature events	Carbon Capture Plants Existing infrastructure Ancillary works	Overheating of equipment Deterioration of material structure and fabric Faster rate of deterioration of materials from increase in UV radiation (e.g. brittleness, fading) Increase in thermal expansion of structure joints Risk of fire Failure of security infrastructure and lighting due to overheating Deterioration of material structure and fabric Failure of water-cooling systems Greater demand for cooling Deformation and melting of paved surfaces Increased dieback of vegetation / planting within the Habitat Provision Area	The Site already carries out regular civil asset condition surveys via external consultants on a framework agreement. This survey only looks at the buildings, roads and their associated production related areas. The agreed survey frequency for the assets is in line with the condition and deterioration rates observed on site. Proactive maintenance to address any defects is carried out in line with the consultant's recommendations. The new buildings will be designed to accommodate temperatures up to 35 degrees with no risk to health and safety of occupants and components for worst-case scenario temperatures. The Applicant has provided extensive fire protection and detection systems standards which will form the basis for the design alongside National Fire Protection Association (NFPA) design standards. The most applicable standards are as follows whilst further standards re stated in **Appendix 14.2** (document reference 6.3.14.2)**:** ~ NFPA 850 Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations

Climate Hazard	Associated Hazard	Receptor(s) affected	Potential Impact	Mitigation
				~ BS EN 60079-14 Explosive atmospheres. Electrical installations design, selection and erection; ~ BS EN 13463-1 Non-electrical equipment for use in potentially explosive atmospheres. Basic method and requirements. ~ BS EN 12845 Fixed firefighting systems – Automatic sprinkler systems – Design, installation and maintenance; ~ NFPA 25 Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems; ~ BS 6266 Code of practice for fire protection for electronic equipment installations Up to 4 new fire water tanks will be located adjacent to the Solvent Storage and Make-up System. The Applicant is looking at the possibility of using redundant water tanks within the existing boiler house building as an alternative to installation of up to 4 new fire water tanks, however this design hasn't been looked at in full and will be done during FEED. Road Modifications will be designed in accordance with Design Manual for Roads and Bridges (National Highways, March 2021), or other locally agreed highway design guidance. The FEED contractor will be responsible for the material design and pavement construction in accordance to the specification agreed the relevant Overseeing Organisation, namely NYCC, ERoY, or National Highways depending on the location of the road modifications. The Applicant has provided its current site emergency plan outlining the compliance of the site and have named those in the roles of maintain health and safety onsite and their responsibilities. This document will be updated following the FEED/detailed design. An alternate secondary electrical supply would be provided from the existing 132 kV air insulated switchgear. To facilitate the secondary electrical supply, upgrade works would be required to the existing 132 kV air insulated switchgear. In addition, further works are required on the interconnection from the existing 132 kV air insulated switchgear to the new distribution voltage infrastructure.

Climate Hazard	Associated Hazard	Receptor(s) affected	Potential Impact	Mitigation
				The site has the ability to re-establish the national grid from total blackout. This ability is tested by National Grid Electricity System Operator (ESO). A greater demand for cooling will be mitigated by improved biofouling control, packing maintenance and excess cooling capacity i.e. 560MWth input into a cooling system designed for 660MWth.
Humidity	Humidity	Carbon Capture Plants Ancillary works	Increase in condensation, mould growth, mildew staining and decay of metal surfaces Poor performance of insulation	The UK Building Regulations and associated design codes consider the control of condensation in buildings, and these will dictate any measures required.

2. PREMLINARY ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

2.1.1. The preliminary assessment in **Table 2.1** takes into account the primary mitigation in **Table 1.1** within the assessment of significance.

Table 2.1 - Preliminary Assessment of Likely Significant Effects

Receptor	Potential impact and resulting effects	Likelihood	Consequence	Significance
Carbon Capture Plants	Flooding of the Carbon Capture Plants and supporting infrastructure	Medium	Moderate adverse	**Significant**
	Damage to structures from increased run off	Low	Moderate adverse	Not Significant
	Faster rate of deterioration of materials from increase in UV radiation e.g. brittleness, fading	Medium	Moderate adverse	**Significant**
	Deterioration of material structure and fabric	Medium	Moderate adverse	**Significant**
	Risk of fire	Low	Large Adverse	Not Significant
	Thermal expansion of building joints	Low	Large adverse	Not Significant
	Failure of water-cooling systems	Low	Large adverse	Not Significant
	Greater demand for cooling	Low	Moderate adverse	Not Significant
	Overheating of equipment	Low	Moderate adverse	Not Significant
	Wind driven rain infiltration into surfaces and materials	Low	Moderate adverse	Not Significant
	Damage / deterioration to cladding and coating	Low	Moderate adverse	Not Significant
	Increase in condensation, mould growth, mildew staining and decay of metal surfaces	Low	Moderate adverse	Not Significant
	Poor performance of insulation	Low	Moderate adverse	Not Significant
	Changes to ground conditions	Low	Moderate adverse	Not Significant
	Lighting strikes leading to power outages onsite and cause fires	Low	Large adverse	Not Significant
Existing infrastructure	Existing drainage infrastructure overwhelmed leading to surface water flooding	Low	Moderate adverse	Not Significant
	Longer growing season, more vigorous vegetation growth in spring and autumn without a vegetation management plan	Low	Moderate adverse	Not Significant
	Windborne dust and debris clogging drainage channels and requiring clearing	Low	Moderate adverse	Not Significant

Receptor	Potential impact and resulting effects	Likelihood	Consequence	Significance
	Damage to structures due to increases run-off	Low	Moderate adverse	Not Significant
	Increase in thermal expansion of structure joints compromising structural integrity leading to increased maintenance	Low	Large adverse	Not Significant
	Overheating of equipment	Low	Moderate adverse	Not Significant
	Faster rate of deterioration of materials from increase in UV radiation e.g. brittleness, fading	Medium	Moderate adverse	**Significant**
	Deterioration of material structure and fabric	Medium	Moderate adverse	**Significant**
	Risk of fire	Low	Large Adverse	Not Significant
	Wind driven rain infiltration into surfaces and materials	Low	Moderate adverse	Not Significant
	Damage / deterioration to cladding and coating	Low	Moderate adverse	Not Significant
	Flooding of the road	Low	Moderate adverse	Not Significant
	Lighting strikes leading to power outages onsite and cause fires	Low	Moderate adverse	Not Significant
	Increased wind loading on Main Stack compromising the structural integrity	Medium	Moderate adverse	**Significant**
Ancillary works	Failure of security infrastructure and lighting due to overheating	Low	Moderate adverse	Not Significant
	Destabilisation due to lightning strike	Low	Moderate adverse	Not Significant
	Power loss	Low	Moderate adverse	Not Significant
	Deformation and melting of paved surfaces	Low	Moderate adverse	Not Significant
	Increase in condensation, mould growth, mildew staining and decay of metal surfaces	Low	Moderate adverse	Not Significant
	Poor performance of insulation	Low	Moderate adverse	Not Significant
Habitat Provision Area	Flooding of the Habitat Provision Area	Low	Moderate adverse	Not Significant
	Increased dieback of vegetation / planting within the Habitat Provision Area	Low	Minor adverse	Not Significant