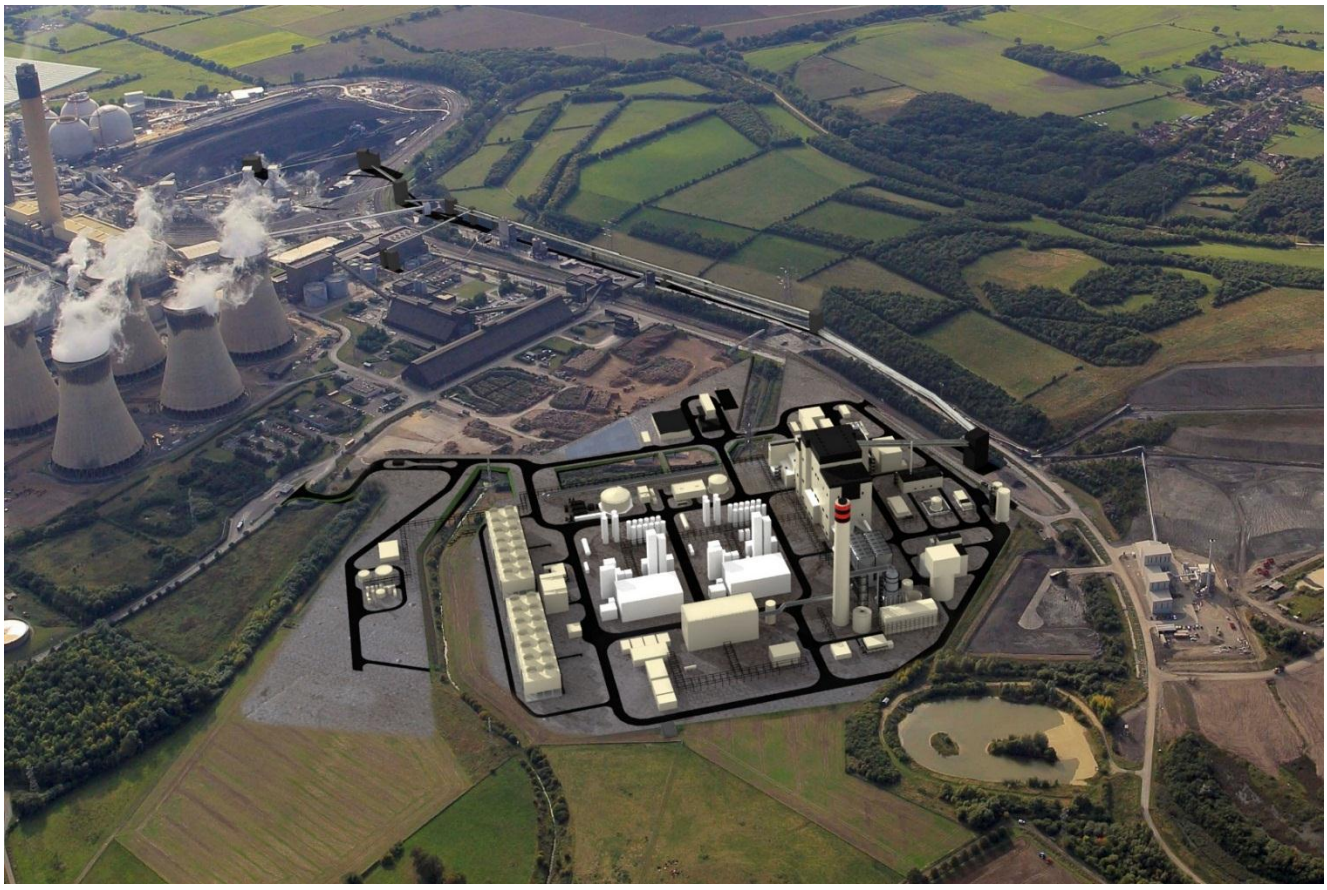
White Rose Carbon Capture and Storage (CCS) Project

Land Adjacent to and within the Drax Power Station Site, Drax, Near Selby, North Yorkshire

Environmental Permit
Pre-amble



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Glossary	
AOD	Above Ordinance Datum
ASU	Air Separation Unit
BS	British Standard
CCS	Carbon Capture and Storage
CEMP	Construction Environmental Management Plan
CPL	Capture Power Limited
dB	Decibel
EA	Environment Agency
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EPC	Engineering, Procurement and Construction
ES	Environmental Statement
FGD	Flue Gas Desulphurisation
FRA	Flood Risk Assessment
GPU	Gas Processing Unit
HGV	Heavy Goods Vehicle
LWS	Local Wildlife Site
MWe	Megawatt
NERC	Natural Environment and Rural Communities (Act 2006)
NSIP	Nationally Significant Infrastructure Project
NYCC	North Yorkshire County Council
PEIR	Preliminary Environmental Information Report
SAC	Special Area of Conservation
SINC	Site of Importance for Nature Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
WHO	World Health Organisation
WSI	Written Scheme of Investigation

CONTENTS

1.0 INTRODUCTION

Capture Power Ltd (CPL) plans to construct a new 448 MWe (gross output) ultra-super critical coal fired power station. The Project will have the capacity to provide electricity sufficient for 630,000 households whilst capturing two million tonnes of carbon dioxide (CO_2) per year arising from the combustion process (approximately 90% of CO_2 emissions generated by the plant). The generating station and the means to capture CO_2 together comprise the White Rose Carbon Capture and Storage (CCS) Plant.

The Project is a key part of the UK's development and commercialisation of CCS, which the Government is supporting through over £1billion of capital and research and development funding. Additionally, the Project will support the development of a CO_2 transmission pipeline (a separate project developed by National Grid Carbon Ltd (NGCL)) which it is hoped will, in the future, be used by other industries and power stations in the Yorkshire and Humber area to transport their CO_2 emissions for permanent storage in the North Sea in geological features.

The application site (henceforth the 'Project site') is located on land adjoining the existing Drax Power Station in North Yorkshire, England. CO_2 captured will not be stored on site as the Project will link to a CO_2 transport and storage solution as noted above. The Project is in line with Government strategies (for instance the CCS Roadmap (1)) for controlling the construction / operation of new electrical generation infrastructure whilst meeting carbon reduction targets for the energy sector in the UK.

A separate Development Consent Order has been submitted to The Planning Inspectorate and was 'Accepted for Examination' on 17 December 2015 but did not include application for a deemed Environmental Permit. Due to the proposed activities of White Rose Carbon Capture and Storage it has been agreed with the Environment Agency that the current Drax Power Limited Environment Permit (VP3530LS) can be varied to accommodate the operations of the White Rose Carbon Capture and Storage Plant.

This Environmental Permit application is made in order to make a variation to the existing Drax Power limited Environment Permit (VP3530LS). The application forms and the associated chapters form the application for a variation to the Environmental Permit which will seek to add the activities of the White Rose Carbon Capture and Storage project to the existing Drax Power Limited Environmental Permit.

2.0 OVERVIEW OF THE APPLICATION

2.1 This chapter provides an overview of the application to vary the existing permit which currently covers the existing Drax Power Station operations and also includes permitting requirements for the Ouse Renewable Energy Plant. Drax Power Limited (Drax) has confirmed that the Ouse Renewable Energy Plant (REP) will now no longer be constructed and hence the relevant information in the permit specific to the Ouse REP should be removed to avoid confusion.

2.2 White Rose comprises a new coal-fired ultra-supercritical Oxyfuel Power Plant (OPP) of up to 448 MWe (gross) and connect into a carbon dioxide transport and storage (T&S) network that will take the carbon dioxide from the OPP and transport it by pipeline for permanent storage under the southern North Sea. The OPP captures around 90% of the carbon dioxide emissions and has the option to co-fire biomass.

2.3 The application focuses on what the operator (Drax) believes are the key areas for varying the permit. It terms of emissions, the fundamental changes involve emissions to air. A specific chapter provides an indepth assessment of the operations of the plant in both air mode (non-capture) and oxy mode (carbon-capture). Information has been generated regarding the treatment of aqueous streams within the White Rose development; however, the discharge parameters which are currently specified in the existing permit will not be altered. This means that the discharge parameters remain BAT.

2.4 One of the fundamental issues which may require further discussion is the permitting of emissions from the plant in oxy mode. It is evident that the operation of the plant in air mode complies with the IED emissions limits for a plant of this size. The plant's impacts on air quality, human health and ecology is significantly lower in oxy mode than it is in air mode and the reason for such low impacts is explained in the relevant chapters. However, for certain species and due to the removal of carbon dioxide from the flue gas, the concentrations can exceed the IED limits even though the mass load released is far smaller than that released in air mode. The proposals made to the Agency have involved a mass based approach to permit emissions to air and the IED allows for this type of metric where a concentration limit is not appropriate for the technology in question, however, the level of environmental protection is equivalent or greater and hence maintains the use and application of BAT.

2.5 Following liaison with the Agency through meetings and telephone conference calls, additional chapters have been added to the application which include a specific BAT chapter identifying key plant and processes and their assessment in terms of evolving and emerging technology. Also, a specific chapter has been developed to provide a technical description of the plant and the associated technology.

2.6 Documents which will also assist the Agency in understanding the technology and the impacts of operating the plant have also been included and these comprise a Combined Heat and Power Assessment generated in October, 2014. Also, a Habitats Regulations Assessment Report (HRA report) has been included which was generated in November, 2014 and its scope, format and content was discussed with the Environment Agency, Natural England and the Planning Inspectorate in November, 2014.

2.7 The breakdown of the application is as follows:

Chapter number	Title	Chapter number	Title
Chapter 1	Introduction	Chapter 6	Management and Systems
Chapter 2	Application Forms	Chapter 7	H1 Assessments
Chapter 3	Site Layout	Chapter 8	Point Source emissions to Air
Chapter 4	Technical Description of White Rose CCS plant	Chapter 9	Point Source emissions to Water
Chapter 5	EP OPRA Assessment	Chapter 10	Noise and Vibration

Chapter 11	Raw Materials	Appendices	CHP Assessment
Chapter 12	Energy Efficiency		HRA Assessment
Chapter 13	BAT statement		

2.8 The operational area of the White Rose CCS plant is almost identical to the area covered by the Ouse Renewable Energy Plant and figures identifying the site boundary and layout of the site are included for reference. The site conditions have not changed since the Ouse REP application was made and hence the associated risks of operating the same listed activities are broadly the same.

2.9 The White Rose CCS plant will include an Air Separation Unit (ASU). Regulatory Position Statement 032, version 2, is specific in that ASUs do not require an Environmental Permit to operate. The RPS states the following:

> ASUs can be found on a variety of installations including food & drink, chemical and metal works. They are usually owned by a third party contractor (e.g. BOC, Air Products, Air Liquide or Linde) and are often operated remotely. Despite being highly integrated into the main installation, ASUs often sit in a fenced-off compound to which the operator carrying out the primary activity has no access.

2.10 In addition, the Agency generated a risk assessment methodology: Environmental risk assessment for carbon capture and storage 2011, Report – GEHO0411BTSN-E-E. This report includes an assessment of oxy-fuel technology and states the following:

> Air separation is a common industrial process with a standard plant design. It is not a PPC Directive activity and does not require an EPR Permit, irrespective of its size.

2.11 The same document is also very clear in that the Agency do not view CCS as novel technology and that the risks posed by CCS technologies are no different to the risks posed by standard power plant. This is important for the operator in understanding the information and detail required by the Agency.

2.12 Based on the clear guidance available at the time of submission, ASUs do not require an environmental permit regardless of whether they are highly integrated or indeed the size of the unit.

2.13 The White Rose CCS site is likely to be a COMAH installation and therefore will have to generate specific plans and documentation prior to commencing operation. Discussions are ongoing with the HSE with regard to how best to manage inventories of various substances onsite.

2.14 A number of figures have been generated to assist with the understanding of the power plant and the application. These figures include:

Figure 1.	Oxyfuel process	Figure 5. Site Location Plan
Figure 2.	Indicative site layout	Figure 6. Habitats Plan
Figure 3.	Elevations of structures	Figure 7. Historic Environment Plan
Figure 4.	Main infrastructure area	