

# COG MOORS WWTW – PROPOSED ADVANCED ANAEROBIC DIGESTION (AAD) PLANT

## Non-Technical Summary

4798-S-203-HYD-XX-XX-RP-XX-10189

MARCH 2018

Incorporating

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## Version control

Issue	Revision No.	Date Issued	Description of Revision: Page No.	Description of Revision: Comment	Reviewed by:
001	R01	October 2017	Final scheme updated	First Issue	LW
002	R02	November 2017	Planning application boundary	Final	LW
003	R03	March 2018		Final	LW

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## DRAWINGS

Drawing 1279-W-201-HYD-XX-XX-DR-XX-06100 – Planning Application Site Location

Drawing 4798-S-202-HYD-XX-XX-DR-XX-06120 – Proposed Site Development

Drawing 4798-S-202-HYD-XX-XX-DR-XX-06149 – Proposed Site Development Aerial



# 1 Introduction

## 1.1 Project Context

Dwr Cymru Welsh Water (DCWW) are applying for full planning permission to extend the existing Waste Water Treatment Works (WwTW) at Cog Moors and construct an Advanced Anaerobic Digestion (AAD) Plant.

Cog Moors WwTW was built in the mid-1990's and is one of DCWW's major works in South Wales, treating waste water for a population of around 197,000 in the Dinas Powys, Sully, Penarth, West Cardiff and Barry areas. In 2008 the works was expanded to accommodate growth in the area as well as to add a new treatment process to treat waste water to the highest environmental standard and help improve bathing water quality in the area (including bathing waters at Whitmore Bay Blue Flag beach). The works caters for future growth in the area in line with the Vale of Glamorgan Local Development Plan 2011-2026.

Cog Moors WwTW is located to the east of the A4055 Cardiff Road, approximately 2km east of Barry and 1km south of Dinas Powys. The location of the proposed Development is shown in *Drawing 1279-W-201-HYD-XX-XX-DR-XX-06100* – Planning Application Site Location. The proposed Development is located on the eastern side of the existing WwTW, next to the existing sewage sludge treatment facilities. Part of the proposed Development would be located within the existing operational area of the WwTW and part would be sited immediately to the east of the existing operational area on an area of woodland, scrub and grass which is already owned by DCWW.

As part of its sustainability strategy, DCWW is seeking to reduce its carbon footprint, as an effective contribution to the wider effort within Wales. It is intended that this will be achieved, in part, through improved energy efficiency and carbon reduction measures, particularly through investment in advanced anaerobic sewage sludge digestion. AAD plants have been installed and are fully operational at both Afan and Cardiff WwTW and the proposed development of an AAD plant at Cog Moors WwTW would further support DCWW's sustainability strategy. As a not-for-profit company without shareholders, DCWW passes these economic benefits on to its customers, in terms of reduced water charges and re-investment back into the business for further service improvements.

Additional sewage sludge treatment capacity is needed in order to deal with increased volumes of sewage sludge generated as a result of both population growth and improvements to waste water treatment processes which improve the quality of the treated effluent. Additional capacity is also required to increase both flexibility and resilience, in the event planned maintenance shutdowns or the unexpected unavailability of DCWW's sludge treatment facilities at Cardiff, Afan or elsewhere.

Cog Moors has been selected for the AAD plant for a number of reasons. Cog Moors WwTW is one of DCWW's major WwTW in South Wales and serves a large geographic catchment which includes Barry, Dinas Powys, Penarth, Cardiff West, and Sully. In treating the waste waters that arise from this area, the Cog Moors WwTW generates a substantial volume of sewage sludge. The proposed AAD plant development will supplement the operation of the existing digesters (which will be refurbished) and will provide additional capacity to accept and treat sewage sludge arising from other WwTW in South Wales. Cog Moors WwTW also has the capacity to treat the additional liquors (liquids) that would result from the sludge arising from the site itself, as well as other smaller WwTW sites in South Wales.

The planning application for the proposed development is accompanied by Ecology Reports, a Tree Survey (Arboricultural Assessment), a Flood Consequences Assessment, an Air Quality Assessment, an Odour Assessment, a Noise Impact Assessment, a Transport Statement and a Construction Traffic Management Plan, a Landscape and Visual Impact Assessment (LVIA), a Landscape Management Plan, a Drainage Statement and a Supporting Planning Statement. This report provides a Non-Technical Summary of the findings of these reports.

## 2 The Proposals

### 2.1 The Existing Site

The WwTW site contains both concrete and steel process tanks, together with a series of process and control buildings and associated items of plant and equipment.

Access for vehicles and pedestrians to the site is via a private road (Green Lane), which leads to the site from the A4055.

The WwTW site is located within a gently rolling landscape, surrounded by small fields separated by ditches and enclosed by hedgerows and trees. The land rises more steeply to the north of the WwTW site (Pop Hill) and this area also has scattered woodland.

The nearest residential properties to the WwTW site are located at Downs Farm, approximately 230 metres (m) to the east and Brook Cottage on Sully Road, approximately 290m to the south east. Other residential properties are located, at distances of more than 0.5km, on Ashby Road to the south, along Cross Common Road to the north east and along Sully Road and Cog Road to the east and south, respectively.

The WwTW is well screened in the surrounding landscape, and from most of the surrounding roads and properties, by the sloping land around it and by existing hedgerows and trees.

### 2.2 The Proposed Development

The proposed Development is shown on Figure 2. An Aerial image of the site is shown in Figure 3.

A compact layout has been designed, in order to avoid the loss of individual trees located along the north-eastern boundary of the site, which are the subject of a Tree Preservation Order (TPO), and to minimise the loss of an area of woodland immediately to the east and south east, which is also covered by a TPO.

Part of the AAD plant would be located within the existing operational WwTW area. The balance of the proposed Development would be sited immediately to the east of the operational area, on an area of woodland and scrub.

The proposed AAD plant comprises process equipment and storage tanks and buildings, together with the demolition of and changes to some existing items of plant and equipment.

The AAD plant receives sludge from the existing Cog Moors Waste Water Treatment Works. Sludge will also be imported from other waste water treatment works. The different sludges are blended together in storage tanks. A process known as thermal hydrolysis is then applied to the sludges. This process breaks down cells in the sludge which enhances the generation of biogas in the next stage of the treatment, the digestion phase. This takes place in large tanks from which the digested sludge is pumped to a final process where waste water is removed from the sludge and returned to the waste water treatment works. The sludge is now a thicker consistency known as sludge cake and is stored before being transported away for disposal to land. A number of tanks, process equipment and buildings containing process equipment are located around the site to form the advanced anaerobic digestion plant.

The height of the proposed tanks and other structures has been reduced where possible in order to minimise their landscape and visual impacts. In addition, the height of the proposed Combined Heat and Power (CHP)/boiler stack has been kept as low as possible, whilst still ensuring dispersion meets the relevant standards at all times.

At Cog Moors WwTW, the sewage sludge that results from the treatment of waste waters is currently treated by anaerobic digestion. The digestion process releases biogas, which is used to generate electricity on site, whilst the sewage sludge, following digestion, (referred to as “sludge cake”) is then disposed of to farmland as a soil improver and fertiliser. The residual liquors (liquids), following digestion, are returned to the WwTW inlet works for treatment.

Over recent years, advanced anaerobic digestion (AAD) technologies, involving thermal hydrolysis, have become well established and enable the overall digestion process to operate more efficiently, producing both increased volumes of biogas and an improved fertiliser. This process conditions waste water solids at a high temperature and pressure to improve digestion and produce a higher quality sludge cake.

The proposed AAD process at Cog Moors WwTW would operate with the existing digesters (which would be refurbished), thereby making full use of the existing infrastructure and the investment that has taken place previously at the site. The existing anaerobic digestion facilities at Cog Moors WwTW have operated for a number of years and DCWW already has a trained local workforce at the site with a wealth of experience in operating the digestion processes.

The biogas produced by the proposed AAD plant will be used, via a combined heat and power (CHP) plant and boiler to generate heat and renewable electricity, for use on site or for export to the electricity grid. The sludge cake will be recycled to farmland as a high-value and sustainable fertiliser (an AAD plant produces a significantly reduced volume of sludge cake from a similar volume of sewage sludge compared with a standard anaerobic digester). The remaining liquids, produced during the sludge treatment process, will be returned to the WwTW inlet works for treatment.

Odour and noise control measures will be included as part of the proposed development and will serve to mitigate any potential impact to the local community. Emissions from the proposed stack will be carefully controlled to ensure that air quality standards are satisfied. The lighting of the proposed Development will be carefully controlled to ensure that lighting spill is minimised.

Ecological mitigation measures, including habitat management, will be implemented in order to offset any potential harm to flora and fauna of nature conservation importance. A biodiversity strategy will be adopted, and a habitat management plan will be implemented to manage the existing and proposed newly created habitats once the site is operational.

Access to the proposed Development would continue to be from the A4055 via Green Lane.

An AAD plant produces a significantly reduced volume of sludge cake from a similar volume of sewage sludge than a standard anaerobic digester. Therefore, once operational, the proposed Development would result in a minor numerical increase only in Heavy Goods Vehicle (HGV) movements.

Temporary construction compounds will be located on an area of mown grassland, immediately adjacent to the existing final settlement tanks, and on an area of grassland to the east of the proposed AAD plant. The temporary construction compound sites will be reinstated upon completion of the proposed Development.

### **3 Summary of Environmental Reports**

The following sections describe the impacts of the proposed Development on each environmental topic.

#### **3.1 Ecology and Nature Conservation**

Ecological surveys have been undertaken to identify any ecological constraints associated with the proposed Development.

A strip of land in the west of the site is within Cog Moors Site of Special Scientific Interest (SSSI), although no development is proposed within this part of the site. Land adjacent to the east of Cog Moors WwTW is designated as Cog Moors Site of Importance for Nature Conservation. This area would be directly affected by proposed Development.

The site is made up of areas of hard standing, buildings/equipment and amenity grassland, with smaller areas of semi-natural and planted broadleaved woodland and tall vegetation. These habitats are suitable to support breeding birds, badgers, dormice, bats, reptiles and great crested newts. The invasive plant species Indian (Himalayan) Balsam and Japanese Knotweed are present within the site.

The surveys found that the area of the site designated as a Site of Nature Conservation which will be affected by the proposed Development does not meet the criteria for which the site was designated (Purple Moor-grass and Rush Pasture); however, it does meet the criteria for designation as Neutral Grassland/Lowland Meadow. A number of mitigation measures are proposed to minimise the impacts of the proposed Development on the Site of Importance for Nature Conservation, including habitat creation, reinstatement and long-term management, protection of retained habitats during construction and management of invasive plants.

The surveys found no evidence of badgers within the proposed Development site.

The surveys found no reptiles, only common toad and common frog. No specific mitigation for reptiles is required; however, vegetation clearance will be carried out in phases and under ecologist supervision as a precautionary approach to avoid harm/injury to reptiles and amphibians.

Surveys were undertaken to determine whether there are great crested newts in waterbodies within 250m of the proposed Development. A number of the waterbodies were on private land and could not be accessed and several of the waterbodies that could be accessed were found to be dry. Two waterbodies were surveyed. No evidence of great crested newt were found, only tadpoles, European eel and water shrew. As some of the waterbodies could not be surveyed and as the site offers suitable terrestrial habitat for great crested newts, vegetation clearance will take place in stages and will be overseen by an ecologist as a precautionary approach to avoid harm/injury to amphibian species.

Surveys were undertaken to determine the suitability of trees for roosting bats. Of the trees that will be directly affected by the proposed Development, five trees have features suitable for use by roosting bats. The potential for roosting bats is considered to be low and in accordance with best practice guidelines, no further/specific surveys are required. However, as a precautionary approach, tree felling will be undertaken during the winter when roosting bats and nesting birds are least likely to be present. Surveys were also undertaken to determine which bat species utilise the site, and the ways in which they use the site. Surveys recorded small numbers of bats with activity concentrated around woodland in Cog Moors Site of Importance for Nature Conservation.

The scheme has been designed with intelligent lighting technology to minimise light spill onto existing and newly planted vegetation, and bat boxes will be provided to increase the number of available roosting sites. Landscaping has been designed to maintain and enhance habitat connectivity for bats.

Surveys were undertaken to determine if dormice are present on the site. The surveys found one dormouse nest and a number of wood mice. The results suggest the site supports a small population of dormice. As dormice have been found on site, a development licence from Natural Resources Wales is required before any vegetation clearance can take place. Vegetation clearance will be undertaken in a sensitive manner and at an appropriate time of year so as not to disturb or harm dormice. Landscaping has been designed to maintain and enhance habitat quality and connectivity to minimise effects on dormice.

Ecological mitigation measures, including habitat management, will be undertaken. A Biodiversity Strategy will be adopted and the existing habitats on site and new planting will be managed in accordance with a Habitat Management Plan.

### **3.2 Trees and Woodland**

A Tree Survey and impact assessment was undertaken in line with British Standard BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations' (BS 5837: 2012). Where possible individual trees, groups of trees and hedgerows will be kept within the site.

A compact layout has been developed in order to avoid the loss of individual trees located along the north-eastern boundary of the site (which are covered by a Tree Preservation Order) and to minimise the loss of an area of woodland immediately to the east and south east. The proposed Development will require the removal of a small number of individual trees and part of a woodland to the east of the existing operational area. Measures such as temporary fencing will be put in place to protect retained trees during the construction phase. The Biodiversity Strategy will include tree and woodland planting.

### **3.3 Surface Water and Flooding**

The site is located approximately 300 metres (m) from the Sully Brook to the south. The Cadoxton River is located approximately 700m from the western boundary of the site. The site is located approximately 5km north of the coastline.

A Flood Consequences Assessment has been undertaken. The proposed Development is located in an area of the site with a negligible risk of flooding. The temporary site compound at the west end of the site is located in an area which could be subject to flooding and the precautionary measure of raising the site cabins will be adopted. A drainage strategy has been developed to ensure that where possible existing

drains on the site are kept and drainage is included within the site to ensure surface water is dealt with appropriately. Flood risk to nearby residential properties is also considered negligible and not significant.

### **3.4 Air Quality**

An air quality assessment has been undertaken to assess air pollution associated with the proposed AAD plant. The biogas produced by the proposed AAD plant would be used, via a combined heat and power (CHP) plant, to generate heat and renewable electricity for use on site or for export to the electricity grid. The CHP plant and gas boilers used will produce emissions which will be released to atmosphere through a 18m stack in order to allow good dispersion.

A detailed air pollution dispersion model has been used together with information on pollution emissions and hourly weather observations to predict pollution levels at nearby sensitive receptors such as houses and sites of importance for ecology and habitats. The model predictions have been compared against pollution thresholds set by UK Government and EU regulations to protect human health and ecology. The assessment has been undertaken assuming that the CHP plant is operating at fully capacity, for every hour of the year, which likely overestimates emissions and air pollution, as the plant will not be used continuously at maximum output.

The results of the pollution model indicate that the AAD plant will not lead to exceedances of air pollution thresholds, and pollution levels are expected to be well below human health based thresholds with the plant in operation. The emissions from the AAD plant are also predicted to have no significant effects on ecology and habitats.

### **3.5 Odour**

An odour assessment has been carried out to assess odour associated with the proposed AAD plant. The scheme will include two odour control units which will reduce the odour from the sludge treatment process.

A detailed dispersion model has been used to predict odour levels at nearby sensitive receptors closest to the site are expected to experience a reduction in odour from the sludge treatment process due to more effective odour control measures being provided and improved dispersion compared to the current sludge treatment process.

### **3.6 Noise**

Baseline noise levels have been undertaken at a number of locations around the site which represent the closest noise sensitive residential properties to the proposed Development.

With the proposed design controls and mitigation in place, the noise generated by the proposed AAD facility is not expected to affect amenity at nearby residential properties.

### **3.7 Transport**

Access to the proposed Development would continue to be from the A4055 via Green Lane. This access is already able to accommodate the largest vehicle type associated with existing and proposed operations, as well as vehicles which would visit the site during the construction phase.

Vehicle parking will be provided to accommodate all vehicle types associated with the proposed operational activities and construction phase.

During the construction phase the effects on traffic would be minor. A Construction Traffic Management Plan will set out how vehicle movements will be managed. This will include management of Heavy Goods Vehicles (HGVs) so that access will be from south of the A4055/Green Lane junction.

Once operational, the new AAD plant will produce a reduced volume of sludge cake compared to a standard anaerobic digester. Vehicles used to import and remove sludge from the new plant will have a larger capacity and this will reduce traffic volumes. There would only be a minor increase in HGVs and overall operational movements would change from 23 two-way daily vehicle trips to 31 following completion of the proposed Development.

During operation haulage contractors will be advised that the preferred access route for HGVs will also be from the south of the A4055/Green Lane junction.

### **3.8 Landscape and Visual**

A landscape and visual impact assessment has been undertaken to assess the potential effects of the proposed Development.

The proposed Development site includes the existing WwTW. Surrounding the site is farmland, enclosed by woodland and hedgerows, together with small settlements, individual residential properties and agricultural buildings.

Due to existing vegetation and the rolling landscape, the proposed Development is only expected to be visible from certain properties, Public Rights of Way, and roads within 0.5km of the proposed Development. The majority of the proposed Development would only be visible from limited view points within the local area.

Proposed planting would strengthen existing vegetation, and help integrate the proposals with the surrounding landscape. The colours of the proposed buildings and structures (grey and green colours) have been carefully chosen to fit in with the landscape.

## **4 Summary of Key Benefits**

As part of its sustainability strategy, DCWW is seeking to reduce its carbon footprint, as an effective contribution to the wider effort within Wales. It is intended that this will be achieved, in part, through improved energy efficiency and carbon reduction measures, particularly through investment in advanced anaerobic sewage sludge digestion.

The proposed AAD Plant at Cog Moors will generate renewable energy and will make a positive contribution towards the reduction of climate change. The AAD process has the benefit of providing a higher quality sludge cake for disposal to farmland as a soil improver and agricultural fertiliser.

As a not-for-profit company without shareholders, DCWW passes these economic benefits on to its customers, in terms of reduced water charges and re-investment back into the business for further service improvements.

## **5 Further Information**

The planning application is available to view on the Vale of Glamorgan Council website - [www.valeofglamorgan.gov.uk](http://www.valeofglamorgan.gov.uk)

## Drawings

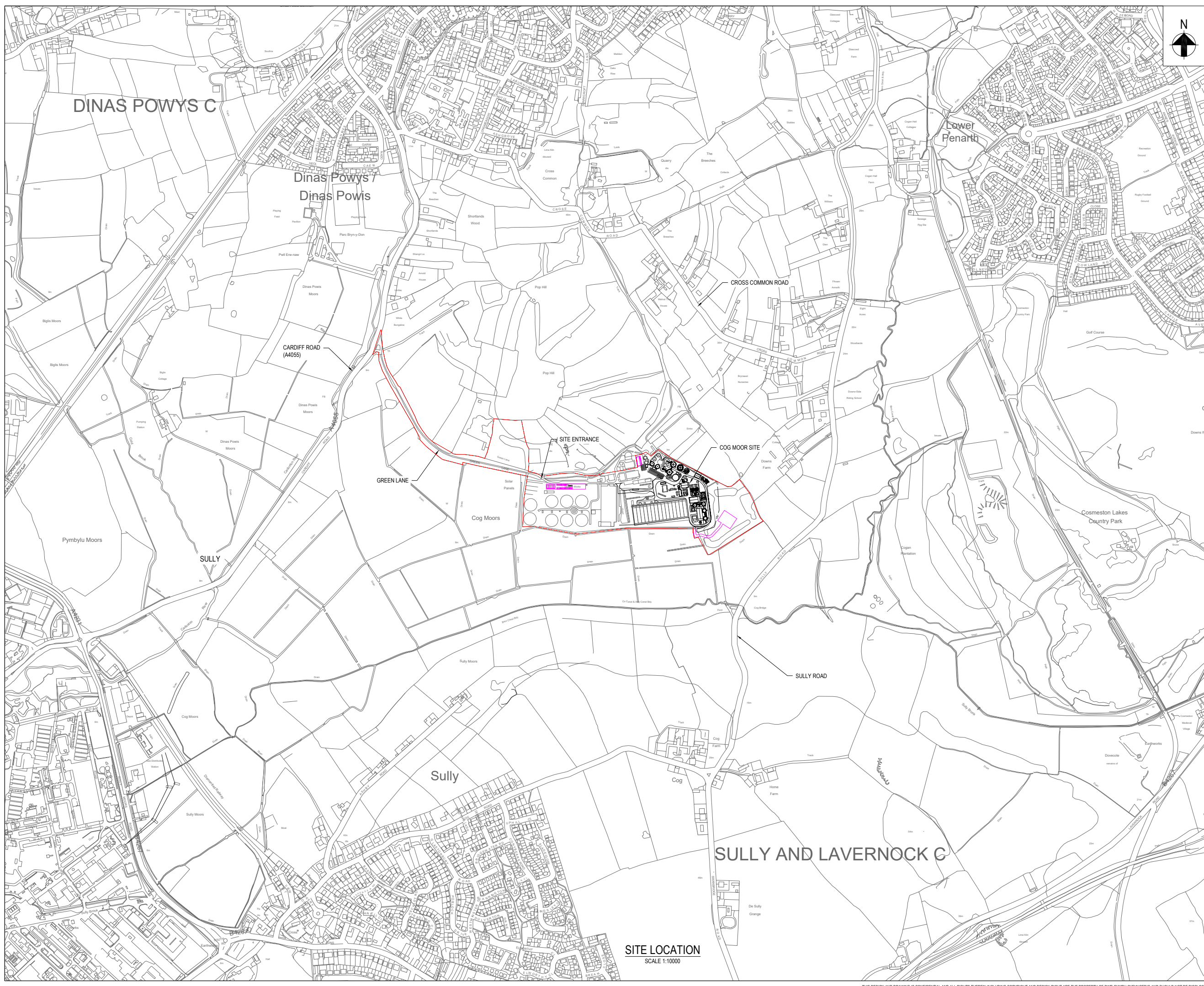
**Drawing 1279-W-201-HYD-XX-XX-DR-XX-06100 – Planning Application Site Location**





- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
  2. DO NOT SCALE FROM THIS DRAWING.

- LEGEND:**
- PLANNING APPLICATION BOUNDARY
  - EXISTING
  - PROPOSED
  - TEMPORARY CONTRACTORS COMPOUND



**SITE LOCATION**  
SCALE 1:10000

P02	15/03/18	TS	FOR INFORMATION	DM	MN	15/03/18
P01	23/10/17	TS	FOR INFORMATION	YF	MN	23/10/17
Rev.	Date	Drawn	Description	Chkd	Appd.	Date

**Capital Delivery Alliance**  
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Ty Awan, Spooner Close, Coed Kermaw, Newport, NP108FZ

Project Name:  
**COG MOORS WwTW AAD**

Drawing Title:  
**PLANNING APPLICATION SITE LOCATION**

Suitability:  
**ISSUED FOR INFORMATION** Suitability Code: **S2**

Originator: **TS** Designer: **RN** Date: **15.03.2017**

Internal Project Number: **UA007902** Scale: **1:10000** Rev: **P02**

Drawing Number:  
**1279-W-201-HYD-XX-XX-DR-XX-06100**



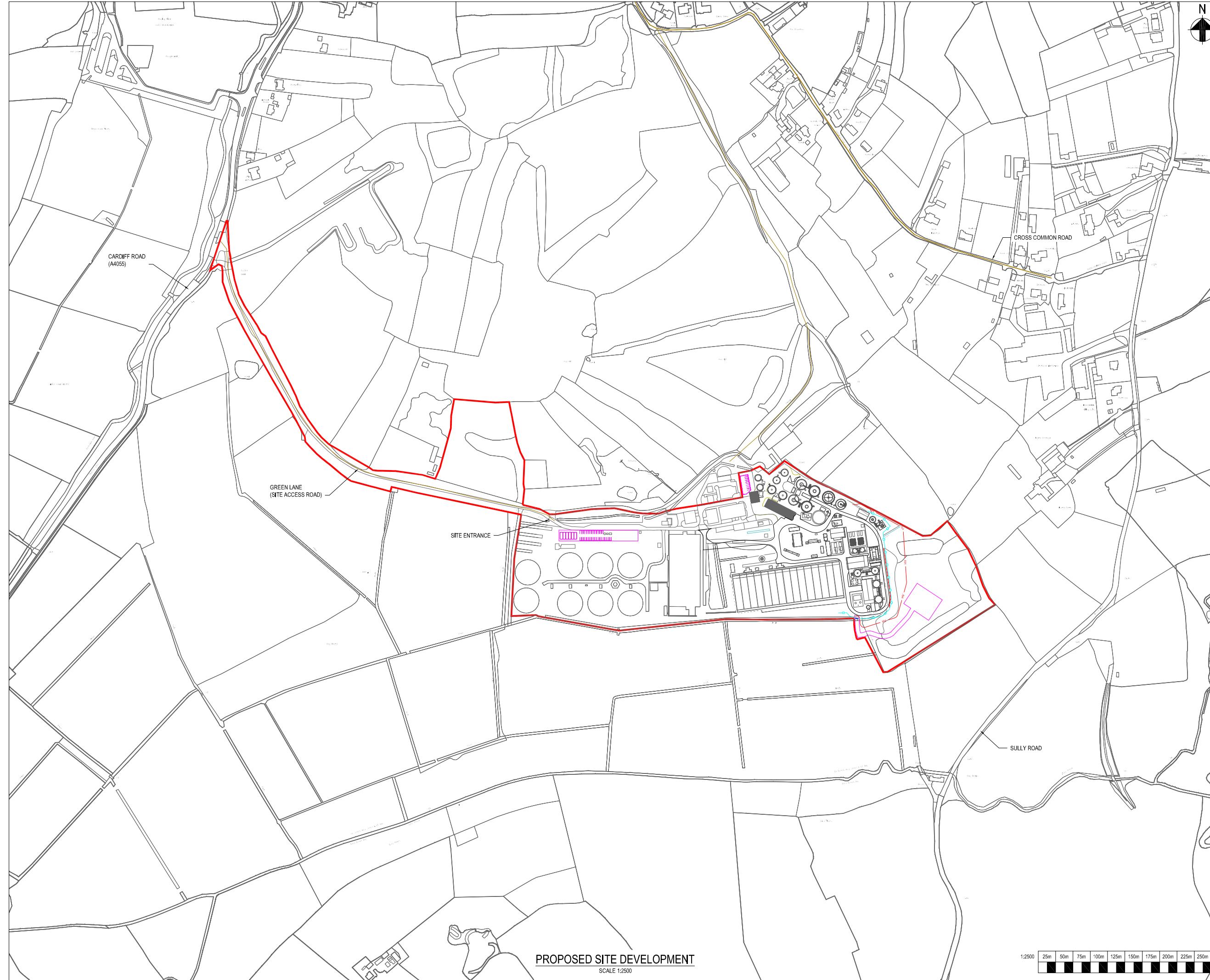
Cog Moors WwTW – Proposed Advanced Anaerobic Digestion (AAD) Plant

**Drawing 4798-S-202-HYD-XX-XX-DR-XX-06120 – Proposed Site Development**



- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
  2. ALL LEVELS ARE IN METERS ABOVE GROUND LEVEL.
  3. DO NOT SCALE FROM THIS DRAWING.

- LEGEND:**
- PLANNING APPLICATION BOUNDARY
  - EXISTING
  - PROPOSED
  - TEMPORARY CONTRACTORS COMPOUND
  - PROPOSED SECURITY FENCE TO TIE INTO EXISTING FENCE LINE

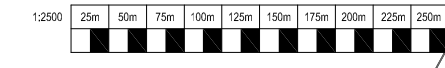


P03	14/03/18	DM	UPDATED BOUNDARY	LW	MN	14/03/18
P02	17/10/17	DP	FOR INFORMATION	YF	MN	17/10/17
P01	21/08/17	DP	FOR INFORMATION	YF	MN	21/08/17
Rev.	Date	Drawn	Description	Chkd.	Aspt.	Date

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Project Name		COG MOORS WwTW AAD	
Drawing Title		PROPOSED SITE DEVELOPMENT	
Suitability			Suitability Code
ISSUED FOR INFORMATION			S2
Originator	Designer	Date	
DP	RN	17/10/17	
Internal Project Number	Scale	Rev.	
UA007902	1:2500	P03	
Drawing Number			
4798-S-202-HYD-XX-XX-DR-XX-06120			

**PROPOSED SITE DEVELOPMENT**  
 SCALE 1:2500



Cog Moors WwTW – Proposed Advanced Anaerobic Digestion (AAD) Plant

**Drawing 4798-S-202-HYD-XX-XX-DR-XX-06149 – Proposed Site Development Aerial**





**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
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3. DO NOT SCALE FROM THIS DRAWING.

**LEGEND:**

—— PLANNING APPLICATION BOUNDARY

**A1**

P02	15/03/18	DP	FOR INFORMATION	LW	MN	15/03/18
P01	25/08/17	DP	FOR INFORMATION	YF	MN	27/10/17
Rev.	Date	Drawn	Description	Chkd	Appd	Date

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Project Name:  
 COG MOORS WwTW AAD

Drawing Title:  
 PROPOSED SITE DEVELOPMENT AERIAL

Suitability:  
 ISSUED FOR INFORMATION

Originator: DP  
 Designer: RN  
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