ZETLAND GROUP
FROM CONCEPTION TO COMPLETION

Zetland Group Limited
23a Milton Street
Saltburn-by-the-Sea
TS12 1DJ

Tel: 01287 625 650
Email: info@zetlandgroup.com
www.zetlandgroup.com

Your Ref: EPR/AB3609XX
Our Ref: ZG/ERUK/EPR/W1/001

3rd June 2016

Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
South Yorkshire
S9 4WF

FAO Permitting Support Centre

VARIATION FOR PERMIT - ENVIRONMENTAL PERMITTING REGULATIONS 2010
EGDON RESOURSES UK LIMITED
WRESSLE-1 HYDROCARBON PRODUCTION AND SHORT DURATION WELL OPERATIONS

Please find attached the permit variation and supporting documentation for the Wressle-1 Hydrocarbon Production and Short Durations Well Operations, which we formally submit to the Environment Agency for consideration.

The charges associated with the permit application are as follows:

- Mining waste operation - £1,960.00 (Variation Fee)
- Installation (Oil Storage) - £10,300.00 (OPRA Application Fee)
- Groundwater Activity - £885.00 (Application Fee)
- Administration Fee - £500.00 (public notices etc.)

Total charge for the application is £13,645.00, which will be transferred electronically to the account detailed within the Part F1/F2 application forms. The reference number for the electronic transfer will be PSCAPPEGDON001.

Yours sincerely
for **Egdon Resources UK Limited**

Sean Smart
HSE & Permit Advisor

Tel: 01287 625650
Mob: 07715 901398
Email: ssmart@zetlandgroup.com

Document:	**Cover Document**
Document Number:	**ER-EPRA-W1-CD-001**

Egdon Resources UK Ltd

Wressle Wellsite

Wressle-1

Hydrocarbon Production and Short Duration Well Operations, including Near Wellbore Treatments and Proppant Squeeze Operations

3rd June 2016

Environmental Permit Variation Documents

Site Location	**Wressle Wellsite – Wressle-1 Wells**		
Document Number	**Document Name**	**Revision No.**	**Included Yes/No**
ER-EPRA-W1-CD-001	Cover Document	0	Yes
ER-EPRA-W1-FO-002	Application Forms	0	Yes
ER-EPRA-W1-NTS-003	Non-Technical Summary	0	Yes
ER-EPRA-W1-SP-004	Site Layout Plans	0	Yes
ER-EPRA-W1-WMP-005	Waste Management Plan	0	Yes
ER-EPRA-W1-SCR-006	Site Condition Report	0	Yes
ER-EPRA-W1-ERA-007	Environmental Risk Assessment	0	Yes
ER-EPRA-W1-OPRA-008	OPRA Spreadsheet	0	Yes
ER-EPRA-W1-FC-009	Fluid Composition	0	Yes

Variation Forms

Wressle Wellsite

Wressle-1

Hydrocarbon Production and Short Duration Well Operations, including Near Wellbore Treatments and Proppant Squeeze Operations

3rd June 2016

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Application for an environmental permit Part A – About you

You will need to fill in this part A if you are applying for a new permit, applying to change an existing permit or surrender your permit, or want to transfer an existing permit to yourself. Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

Note: if you believe including information on a public register would not be in the interests of national security you must tick the box in section 5 of F1 or F2 and enclose a letter telling us that you have told the Secretary of State. We will not include the information in the public register unless directed otherwise.

It will take less than one hour to fill in this part of the application form.

Where you see the term 'document reference' on the form, give the document references and send the documents with the application form when you've completed it.

Contents

1 About you
2 Applications from an individual
3 Applications from an organisation of individuals
4 Applications from public bodies
5 Applications from companies
6 Your address
7 Contact details
8 How to contact us

1 About you

Are you applying as an individual, an organisation of individuals (for example, a partnership), a company (this includes Limited Liability Partnerships) or a public body?

An individual	☐ Now go to section 2
An organisation of individuals (for example, a partnership)	☐ Now go to section 3
A public body	☐ Now go to section 4
A registered company or other corporate body	☑ Now go to section 5

2 Applications from an individual

2a Please give us the following details

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Date of birth (DD/MM/YYYY)

Now go to section 6

3 Applications from an organisation of individuals

3a Type of organisation

For example, a charity, a partnership, a group of individuals or a club

3b Details of the organisation

If you are an organisation of individuals, please give the details of the main representative below. If relevant, provide details of other members (please include their title Mr, Mrs and so on) on a separate sheet and tell us the document reference you have given this sheet.

Contact name

Title (Mr, Mrs, Miss and so on)

First name

3 Applications from an organisation of individuals, continued

Last name

Date of birth (DD/MM/YYYY)

Now go to section 6

4 Applications from public bodies

4a Type of public body

For example, NHS trust, local authority, English county council

4b Name of the public body

4c Please give us the following details of the executive

An officer of the public body authorised to sign on your behalf

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position

Now go to section 6

5 Applications from companies or corporate bodies

5a Name of the company

Egdon Resources UK Ltd.

5b Company registration number

03424561

Date of registration (DD/MM/YYYY)

26/08/1997

If you are applying as a corporate organisation that is not a limited company, please provide evidence of your status and tell us below the reference you have given the document containing this evidence.

Document reference

Now go to section 6

6 Your address

6a Your main (registered office) address

For companies this is the address on record at Companies House.

Contact name

Title (Mr, Mrs, Miss and so on)

Mr

First name

Martin

Last name

Brooks

Address

The Wheat House

98 High Street

Odiham

Hampshire

Postcode

RG29 1LP

Contact numbers, including the area code

Phone

01256 702292

Fax

01256 702293

Mobile

07914 603786

Email

martin.brooks@egdon-resources.com

6 Your address, continued

For an organisation of individuals every partner needs to give us their details, including their title Mr, Mrs and so on. So, if necessary, continue on a separate sheet and tell us below the reference you have given the sheet.

Document reference for the extra sheet

6b Main UK business address (if different from above)

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

Now go to section 7

7 Contact details

7a Who can we contact about your application?

This can be someone acting as a consultant or an 'agent' for you.

Contact name

Title (Mr, Mrs, Miss and so on) Mr

First name Sean

Last name Smart

Address Zetland Group Limited
23a Milton Street
Saltburn by the Sea

Postcode TS12 1DJ

Contact numbers, including the area code

Phone 01287 625650

Fax

Mobile 07715 901398

Email ssmart@zetlandgroup.com

7 Contact details, continued

7b Who can we contact about your operation (if different from question 7a)?

Contact name

Title (Mr, Mrs, Miss and so on)	Mr
First name	Jonathan
Last name	Foster
Address	Zetland Group Limited
	23a Milton Street
	Saltburn by the Sea
Postcode	TS12 1DJ

Contact numbers, including the area code

Phone	01287 625650
Fax	
Mobile	07738 857555
Email	jfoster@zetlandgroup.com

7c Who can we contact about your billing or invoice?

As in question 7a ☐

As in question 7b ☐

Please give details below if different from question 7a or 7b.

Contact name

Title (Mr, Mrs, Miss and so on)	Mrs
First name	Tina
Last name	Guyatt
Address	The Wheat House
	98 High Street
	Odiham
	Hants
Postcode	RG29 1LP

Contact numbers, including the area code

Phone	01256 702292
Fax	
Mobile	
Email	tina.guyatt@egdon-resources.com

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, or you would like us to review a decision we have made, please let us know. More information on how to do this is available at: https://www.gov.uk/government/organisations/environment-agency/about/complaints-procedure

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19101 Clarity approved by Plain English Campaign

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Application for an environmental permit – Part C2 – General – varying a bespoke permit

Fill in this part of the form, together with part A and the relevant parts of C3 to C7 and part F1 or F2, if you are applying to vary (change) the conditions or any other part of the permit. Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or changing existing ones).

Waste operation changing to installation or vice versa?

If your changes mean that a waste operation becomes an installation (or vice versa) you also need to fill in either part C3 (waste to installation) or part C4 (installation to waste).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

It will take less than two hours to fill in this form.

Contents

1 About the permit
2 About your proposed changes
3 Your ability as an operator
4 Consultation
5 Supporting information
6 Environmental risk assessment
7 How to contact us

Appendix 1 – Low impact installation checklist

1 About the permit

Note: If you are applying to convert your existing permit to a standard permit or add a standard facility you need to fill out form C1.

1a Discussions before your application

If you have had discussions with us before your application, provide the permit reference number or details on a separate sheet and tell us below the reference you have given the document.

Permit or document reference: Pre-Aplication Meeting 13/10/2015 - Lincolnshire

1b Permit number

What is the permit number that this application relates to? EPR/AB3609XX/V002

1c Site details

What is the name, address and postcode of the site?

Site name: Wressle 1

Address: Lodge Farm
Clapp Gate
Broughton and Appleby
North Lincolnshire

Postcode: DN15 0DB

2 About your proposed changes

2a Type of variation

What type of variation are you applying for? (Please tick)

Standalone water discharge activity or point source groundwater activity ☐

Minor technical ☐

Normal variation ☐

Substantial ☐

2 About your proposed changes, continued

2b Changes or additions to existing activities

Please give us brief details in the box below. More detailed information can be given in Table 1 below.

The Wressle-1 wellsite is currently a classified as a Mining Waste Operation. It is anticipated that a sidetrack will be undertaken, and as such the waste quantities are required to be ammended to reflect this. Due to the pottential undertaking of a proppant squeeze if required, the Wressle-1 wellstite will also be be classified as a Mining Waste Operation, including a Mining Waste Facility

It is also anticipated that the Wressle-1 wellsite will be required to hold a groundwater activity permit due to the potential for proppant squeeze fluid to remain in-situ within the formation.

The inclusion of an installation permit due to the requirement to store crude oil at the Wressle-1 wellsite.

Fill in Table 1 with details of all the proposed changes to current activities. In the final column of the table, give us the document reference for the proposed changes and send them to us with your filled in application form.

Fill in a separate table for each activity you are applying to vary or add. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given this document.

Document reference: ER-EPRA-W1-WMP-005

You only need to fill in one table for your mining waste operations.

2c Consolidating (combining) or updating existing permits

If your proposed change is to modernise (update) your permit, now answer 2c1; otherwise go to 2d.

If your proposed change is to consolidate (combine) a number of permits, now answer 2c2; otherwise go to 2d.

Note: In both cases we may require additional information from you about, for example, your management system. Therefore we would always advise you to talk to us before you submit any application to modernise or consolidate permits. Please see the 'Making an application' web page at www.environment-agency.gov.uk.

2c1 Do you want to have a modern style permit?

No ☐

Yes ☑

2c2 Identify all the permits you want to consolidate (combine) by listing the permit numbers in Table 2 below.

Table 2 – Permit numbers

EPR/AB3609XX

2d Treating batteries

Are you proposing to treat batteries?

No ☐

Yes ☐ Tell us how you will do this and send us a copy of your explanation

Document reference for the explanation

2e Low impact installations (installations only)

Will any changes mean that any of the regulated facilities will become low impact installations?

No ☐ Now go to section 3

Yes ☐

If yes, tell us how you meet the conditions for a low impact installation (see the guidance in appendix 1).

Document reference for the explanation

Tick the box to confirm you have filled in the low impact installation checklist in appendix 1 for each regulated facility. ☐

Now go to section 3

Table 1 – Changes to existing activities

Name	Installation schedule 1 references	Description of the installation activity	Description of waste operation	Description of the mining waste operations	Description of water discharge activity	Description of groundwater activity	Proposed changes document reference
i.e. name of installation, waste operation, mining waste operation, water discharge activity or groundwater activity							
Example – Effluent unique name					Example – treated sewage effluent		
If you do not have enough room, go to the line below or send a separate document and give us the document reference here							
Mining Waste		Inclusion of an		Inclusion of a NonHaz		Inclusion of a	ER-EPRA-W1-WMP-
Operation		Installation Activity		Mining Waste Facility		Groundwater Activity	005
		(Oil Storage)		(Retained Proppant		(Retained Proppant	
				Squeeze Fluid)		Squeeze Fluid)	

3 Your ability as an operator

If you are applying to add waste installations or waste operations to a permit that has not previously had them, you need to fill in all of section 3.

If you are applying to consolidate (combine) two or more permits or have an updated permit you must fill in question 3d.

This section does not apply for applications to surrender a permit.

3a Relevant offences (installations and waste operations only – see the guidance notes on part C2)

Have you, or any other relevant person, been convicted of any relevant offence?

No ☐ Now go to question 3b

Yes ☐ Please give details below

Name of the relevant person

Title (Mr, Mrs, Miss and so on)

First name

Last name

Date of birth (DD/MM/YYYY)

Position at the time of the offence

Name of the court

Date of the conviction (DD/MM/YYYY)

Offence and penalty set

Date any appeal against the conviction will be heard

(DD/MM/YYYY)

If necessary, use a separate sheet to give us details of other relevant offences (and post conviction plans if relevant) and tell us below the reference number you have given the extra sheet.

Document reference of the extra sheet

Have you sent us a post conviction plan for this offence?

No ☐ You must send us a post conviction plan with this application and give us the document reference below

Document reference

Yes ☐ Please give us the reference for the post conviction plan you have sent and the date sent in

Post conviction plan reference

Date sent in (DD/MM/YYYY)

Now go to question 3b

3b Technical ability (specified waste management activities and waste operations only – see the guidance notes on part C2)

Please tick the scheme you are using to show you have the suitable technical skills and knowledge to manage your facility.

CIWM/WAMITAB ☐

ESA/EU ☐

Please send in a registration letter from your scheme as above ☐

Now go to question 3c

3c Finances (installations, waste operations and mining waste operations – see the guidance notes on part C2)

Please note that if you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2010.

Do you or any relevant person have current or past bankruptcy or insolvency proceedings against you?

No ☐

Yes ☐ Please give details over page, including the required set-up costs (including infrastructure), maintenance and clean up costs for the proposed facility against which a credit check may be assessed.

3 Your ability as an operator, continued

We may want to contact a credit reference agency for a report about your business's finances.

Landfill, Category A mining waste facilities and mining waste facilities for hazardous waste only

How do you plan to make financial provision (to operate a landfill or a mining waste facility you need to show us that you are financially capable of meeting the obligations of closure and aftercare)?

Bonds ☐
Escrow account ☐
Trust fund ☐
Lump sum ☐
Other ☐

Provide a plan of your estimated expenditure on each phase of the landfill or mining waste facility.

Give the document plan reference number

Now go to question 3d

3d Management systems

You can find guidance on management systems in 'How to Comply'. We have also developed environmental management toolkits for some business sectors which you can use to produce your own management system. You can get these by calling 03708 506 506 or by downloading them from our website at www.environment-agency.gov.uk.

Does your management system meet the conditions set out in our guidance?

No ☐
Yes ☑

What management system will you provide for your regulated facility?

EC Eco-Management and Audit Scheme (EMAS) ☐
ISO 14001 ☐
BS 8555 (Phases 1–5) ☐
Green Dragon ☐
Own management system ☑

You must send us a summary of your management system with your application.

Document reference or references for this summary: ER-EPRA-W1-WMP-005 - Appendix 2

4 Consultation (fill in 4a to 4c for installations and waste operations and 4d for installations only)

Could the waste operation or installation involve releasing any substance into any of the following?

4a A sewer managed by a sewerage undertaker?

No ☐
Yes ☐ Please name the sewerage undertaker

4b A harbour managed by a harbour authority?

No ☐
Yes ☐ Please name the harbour authority

4c Directly into relevant territorial waters or coastal waters within the sea fisheries district of a local fisheries committee?

No ☐
Yes ☐ Please name the fisheries committee

4 Consultation (fill in 4a to 4c for installations and waste operations and 4d for installations only), continued

4d Is the installation on a site for which

4d1 a nuclear site licence is needed under section 1 of the Nuclear Installations Act 1965?

No ☑

Yes ☐

4d2 a policy document for preventing major accidents is needed under regulation 5 of the Control of Major Accident Hazards Regulations 1999, or a safety report is needed under regulation 7 of those regulations?

No ☑

Yes ☐

5 Supporting information

5a Provide a plan or plans for the site (see the guidance notes on part C2 for what needs to be marked on the plan)

Document plan reference or references

ER-EPRA-W1-SP-004

5b Do any of the variations you plan to make need extra land to be included in the permit?

No ☐

Yes ☐ Please provide a site report for the extra land.

Document report reference or references

5c Provide a non-technical summary of your application

Document reference: ER-EPRA-W1-NTS-003

5d Adding an installation

If you are applying to add an installation, tick the box to confirm that you have sent in a baseline report and provide a reference. ☑

Document reference of the report: ER-EPRA-W1-SCR-006

6 Environmental risk assessment (if you need one – see the guidance notes on part C2)

Provide an assessment of the risks each of your proposed activities cause to the environment. The risk assessment must use H1 or an equal method.

Document reference of the assessment: ER-EPRA-W1-ERA-007

7 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19110
Clarity approved by Plain English Campaign

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Plain English Campaign's Crystal Mark does not apply to appendix 1.

Appendix 1 – Low impact installation checklist

Installation reference				
Condition	Response			Do you meet this?
A – Management techniques	Provide references to show how your application meets A.			Yes ☐ No ☐
	References			
B – Aqueous waste	Effluent created		m^3/day	Yes ☐ No ☐
C – Abatement systems	Provide references to show how your application meets C.			Yes ☐ No ☐
	References			
D – Groundwater	Do you plan to release any hazardous substances or non-hazardous pollutants into the ground?		Yes ☐ No ☐	Yes ☐ No ☐
E – Producing waste	Hazardous waste		Tonnes per year	Yes ☐ No ☐
	Non-hazardous waste		Tonnes per year	
F – Using energy	Peak energy consumption		MW	Yes ☐ No ☐
G – Preventing accidents	Do you have appropriate measures to prevent spills and major releases of liquids? (See 'How to comply'.)		Yes ☐ No ☐	Yes ☐ No ☐
	Provide references to show how your application meets G.			
	References			
H – Noise	Provide references to show how your application meets H.			Yes ☐ No ☐
	References			
I – Emissions of polluting substances	Provide references to show how your application meets I.			Yes ☐ No ☐
	References			
J – Odours	Provide references to show how your application meets J.			Yes ☐ No ☐
	References			
K – History of keeping to the regulations	Say here whether you have been involved in any enforcement action as described in Compliance History Appendix 1 explanatory notes.		Yes ☐ No ☐	

Application for an environmental permit
Part C3 – Variation to a bespoke installation permit

Fill in this part of the form, together with part A, part C2 and part F1, if you are applying to vary (change) the conditions or any other part of the permit. Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or making changes to existing ones).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

It will take less than three hours to fill in this part of the application form.

Contents

1 What activities are you applying to vary?
2 Emissions to air, water and land
3 Operating techniques
4 Monitoring
5 Environmental impact assessment
6 Resource efficiency and climate change
7 How to contact us

Appendix 1 – Specific questions for the combustion sector
Appendix 2 – Specific questions for the chemical sector
Appendix 3 – Specific questions for the intensive farming sector
Appendix 4 – Specific questions for the clinical waste sector
Appendix 5 – Specific questions for the hazardous and non-hazardous waste recovery and disposal sector
Appendix 6 – Specific questions for the waste incineration sector
Appendix 7 – Specific questions for the landfill sector

1 What activities are you applying to vary?

Fill in Table 1a below with details of all the activities listed in schedule 1 of the Environmental Permitting Regulations (EPR) and all directly associated activities (DAAs) (in separate rows), that you propose to carry out at the installation.

Fill in a separate table for each installation you are applying to vary. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given the document.

Document reference

Table 1a – Types of activities

Schedule 1 listed activities						
Installation name	Schedule 1 references (See note 1)	Description of the Activity (See note 2)	Activity capacity (See note 3)	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity (if this applies) (See note 3)	Non-hazardous waste treatment capacity (if this applies) (See note 3)
Add extra rows if you need them. If you do not have enough room, go to the line below or send a separate document and give us the document reference here	Put your main activity first			For installations that take waste only	For installations that take waste only	For installations that take waste only
Wressle-1 Oil Storage	1.2 Part A (1) h) (A)	Storage of crude oil	260.00			

Directly associated activities (See note 4)	
Name of DAA	Description of the DAA (please identify the schedule 1 activity it serves)
Add extra rows if you need them	
For installations that take waste	Total storage capacity (See note 5 below)
	Annual throughput (tonnes each year)

1 What activities are you applying to vary?, continued

Notes

1 Quote the section number, part A1 or A2 or B, then paragraph and sub paragraph number as shown in part 2 of schedule 1 to the regulations.

2 Use the description from schedule 1 of the regulations. Include any extra detail that you think would help to accurately describe what you want to do.

3 By 'capacity', we mean:
- the total incineration capacity (tonnes every hour) for waste incinerators;
- the total landfill capacity (cubic metres) for landfills;
- the total treatment capacity (tonnes each day) for waste treatment;
- the total storage capacity (tonnes) for waste storage operations;
- the processing and production capacity for manufacturing operations; or
- the thermal input capacity for combustion activities.

4 Fill this in as a separate line and give an accurate description of any other activities associated with your schedule 1 activities. You cannot have DAAs as part of a mobile plant application.

5 By 'total storage capacity', we mean the maximum amount of waste, in tonnes, you store on the site at any one time.

Types of waste accepted

For those installations that take waste, for each line in Table 1a (including DAAs), fill in a separate document to list those wastes you will accept on to the site for that activity. Give the List of Wastes catalogue code and description. If you need to exclude waste from your activity or facility by restricting the description, quantity, physical nature, hazardous properties, composition or characteristic of the waste, include these in the document. Send it to us with your application form.

Please provide the reference for each document.

You can use Table 1b as a template.

If you want to accept any wastes with a code ending in 99, you must give us more information and a full description.

Document reference for this extra information

Table 1b – Template example – types of waste accepted and restrictions

Waste code	Description of waste
Example 02 01 08* 06 01 02*	Example Agrochemical waste containing dangerous substances Hydrochloric acid

2 Emissions to air, water and land

Fill in Table 2 below with details of the emissions that result from the operating techniques at each of your installations.

Fill in one table for each installation.

Table 2 – Emissions

Installation name	N/A			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				

2 Emissions to air, water and land, continued

Table 2 – Emissions, continued

Point source emissions to water (other than sewers)				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				
Point source emissions to sewers, effluent treatment plants or other transfers off site				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				
Point source emissions to land				
Emission point reference and location	Source	Parameter	Quantity	Unit
N/A				

Supporting information

3 Operating techniques

3a Technical standards

Fill in Table 3 for each activity, at the installation you have referred to in Table 1a above. List the relevant technical guidance note (TGN) or notes you are planning to use. If you are planning to use the standards set out in the TGN, there is no need to justify using them.

You must justify your decisions in a separate document if:

- there is no technical standard;
- the technical guidance provides a choice of standards; or
- you plan to use another standard.

This justification could include a reference to the Environmental Risk Assessment provided in part C2 (general bespoke permit) of the application form.

The documents you have referenced in Table 3 should summarise the main measures you use to control the main issues identified in the H1 assessment or technical guidance. For each of the activities listed in Table 3, describe the type of operation and the options you have chosen for controlling emissions from your process.

3 Operating techniques, continued

Table 3 – Technical standards

Fill in a separate table for each activity at the installation.

Installation name	Wressle-1 Oil Storage	
Description of the schedule 1 activity or directly associated activity	Relevant technical guidance note or Best available techniques as described in BAT conclusions under IED (see footnote below. You will need to refer to 'How to comply' for all permits)	Document reference (if appropriate)
	'How to comply'	
Storage of Crude Oil	Onshore Oil & Gas Sector Guidance	
	Consultation Draft, November 2015	

*Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

If appropriate, use block diagrams to help describe the operation and process. Provide the references for the description.

Document reference for the diagram or description

3b General requirements

Fill in a separate Table 4 for each installation.

Table 4 – General requirements

Name of the installation	
If the TGN or H1 assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them	Document reference or references N/A
Where the TGN or H1 assessment shows that odours are an important issue, send us your odour management plan	Document reference or references N/A
If the TGN or H1 assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)	Document reference or references N/A

3c Types and amounts of raw materials

Fill in Table 5 for all schedule 1 activities. Fill in a separate table for each installation.

Table 5 – Types and amounts of raw materials

Name of the installation		Wressle-1 Oil Storage		
Capacity (See note 1 below)		260.00		
Schedule 1 activity	Description of raw material and composition	Maximum amount (tonnes) (See note 2 below)	Annual throughput (tonnes each year)	Description of the use of the raw material including any main hazards (include safety data sheets)
1.2 Part A (1) h) (A)	Crude Oil	260.00	94,900.00	Storage
(Absolute Maximum)				

Notes

1 By 'capacity', we mean the total storage capacity (tonnes) or total treatment capacity (tonnes each day).
2 By 'maximum amount', we mean the maximum amount of raw materials on the site at any one time.

3 Operating techniques, continued

Use a separate sheet if you have a long list of raw materials, and send it to us with your application form. Please also provide the reference for this extra sheet.

Document reference for the sheet

3d Information for specific sectors

For some of the sectors, we need more information to be able to set appropriate conditions in the permit. This is as well as the information you may provide in sections 5, 6 and 7. For those activities listed below, you must answer the questions in the related document.

Table 6 – Questions for specific sectors

Sector	Appendix
Combustion	See the questions in appendix 1
Chemicals	See the questions in appendix 2
Intensive farming	See the questions in appendix 3
Clinical waste	See the questions in appendix 4
Hazardous and non-hazardous waste recovery and disposal	See the questions in appendix 5
Incinerating waste	See the questions in appendix 6
Landfill	See the questions in appendix 7

General information

4 Monitoring

4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above

You should also describe any environmental monitoring. Tell us:

- how often you use these measures;
- the methods you use; and
- the procedures you follow to assess the measures.

Document reference

4b Point source emissions to air only

Provide an assessment of the sampling locations used to measure point source emissions to air. The assessment must use M1.

Document reference of the assessment

5 Environmental impact assessment

5a Have your proposals been the subject of an environmental impact assessment under Council Directive 85/337/EEC of 27 June 1985 [Environmental Impact Assessment]?

No ☐

Yes ☐ Please provide a copy of the environmental statement and, if the procedure has been completed:

- a copy of the planning permission; and
- the committee report and decision on the EIA.

Document reference for the copy

6 Resource efficiency and climate change

If the site is a landfill, you only need to fill in this section if the application includes landfill gas engines.

6a Describe the basic measures for improving how energy efficient your activities are

Document reference for the description

6b Provide a breakdown of any changes to the energy your activities use up and create

Document reference for the description

6c Have you entered into, or will you enter into, a climate change levy agreement?

No ☐ Describe the specific measures you use for improving your energy efficiency.

Document reference for the description

6 Resource efficiency and climate change, continued

Yes ☐ Please give the date you entered (or the date you expect to enter) into the agreement. Please also provide documents that prove you are taking part in the agreement (DD/MM/YYYY)

Document reference of proof

6d Explain and justify the raw and other materials, other substances and water that you will use

Document reference of the justification

6e Describe how you avoid producing waste in line with Council Directive 2008/98/EC on waste

If you produce waste, describe how you recover it. If it is technically and financially impossible to recover the waste, describe how you dispose of it while avoiding or reducing any effect it has on the environment.

Document reference of the description

7 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03708 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Plain English Campaign's Crystal Mark does not apply to appendices 1 to 7.

Appendix 1 – Specific questions for the combustion sector

1 Identify the type of fuel burned in your combustion units (including when your units are started up, shut down and run as normal). If your units are dual fuelled (that is, use two types of fuel), list both the fuels you use

Fill in a separate table for each installation.

Installation reference			
Type of fuel	When run as normal	When started up	When shut down
Coal			
Gas oil			
Heavy fuel oil			
Natural gas			
WID waste			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Biomass (see notes 1 and 2 below)			
Other			

Notes

1 Not covered by Industrial Emissions Directive 2010/75/EU.
2 'Biomass' is referred to in www.opsi.gov.uk/si/si2002/20020914.htm.

Give extra information if it helps to explain the fuel you use.

Document reference

2 Give the composition range of any fuels you are currently allowed to burn in your combustion plant

Fill in a separate table for each installation.

Fuel use and analysis					
Installation reference					
Parameter	Unit	Fuel 1	Fuel 2	Fuel 3	Fuel 4
Maximum percentage of gross thermal input	%				
Moisture	%				
Ash	% wt/wt dry				
Sulphur	% wt/wt dry				
Chlorine	% wt/wt dry				
Arsenic	% wt/wt dry				
Cadmium	% wt/wt dry				
Carbon	% wt/wt dry				
Chromium	% wt/wt dry				
Copper	% wt/wt dry				
Hydrogen	% wt/wt dry				
Lead	% wt/wt dry				
Mercury	% wt/wt dry				
Nickel	% wt/wt dry				
Nitrogen	% wt/wt dry				
Oxygen	% wt/wt dry				
Vanadium	mg/kg dry				
Zinc	mg/kg dry				
Net calorific value	MJ/kg				

Appendix 1 – Specific questions for the combustion sector, continued

3 If NOx factors are necessary for reporting purposes (that is, if you do not need to monitor emissions), please provide the factors associated with burning the relevant fuels

Fill in a separate table for each installation.

Installation reference	
Fuel	NOx factor (kgt^{-1})
Fuel 1	
Fuel 2	
Fuel 3	
Fuel 4	

Note: kgt^{-1} means kilograms of nitrogen oxides released for each tonne of fuel burned.

4 Will your combustion plant be subject to Chapter III of the Industrial Emissions Directive 2010/75/EU? (see Government Guidance)

No ☐ Now fill in part F

Yes ☐

5 Is your plant

an existing plant (a plant licensed before 1 July 1987)? ☐

a new plant (a plant licensed on or after 1 July 1987 but before 27 November 2002, or a plant for which an application was made before 27 November 2002 and which was put into operation before 27 November 2003)? ☐

or

a new-new plant (a plant for which an application was made on or after 27 November 2002)? ☐

6 If you run more than one type of plant or a number of the same type of plant on your installation, please list them in the table below

Fill in a separate table for each installation.

Installation reference	
Type of plant	Number within installation
Existing	
New	
New-new	
Gas turbine (group A)	
Gas turbine (group B)	

7 If you run an existing plant, have you submitted a declaration for the 'limited life derogation' set out in Article 33 of Chapter III of the Industrial Emissions Directive?

No ☐ Now go to section 9

Yes ☑

8 Have you subsequently withdrawn your declaration?

No ☐

Yes ☐

9 List the existing large combustion plants (LCPs) which have annual mass allowances under the National Emission Reduction Plan (NERP), and those with emission limit values (ELVs) under the LCPD

Installation reference	
LCPs under NERP	LCPs with ELVs

10 Do you meet the monitoring requirements of Chapter III of the Industrial Emissions Directive?

Yes ☐

Document reference number

Appendix 2 – Specific questions for the chemical sector

1 Please provide a technical description of your activities

The description should be enough to allow us to understand:

- the process;
- the main plant and equipment used for each process;
- all reactions, including significant side reactions (that is, the chemistry of the process);
- the material mass flows (including by products and side streams) and the temperatures and pressures in major vessels;
- the all emission control systems (both hardware and management systems), for situations which could involve releasing a significant amount of emissions – particularly the main reactions and how they are controlled;
- a comparison of the indicative BATs and benchmark emission levels standards in Technical Guidance Notes (TGNs) EPR 4.01, EPR 4.02 and EPR 4.03 and chemical sector BREFs.

Document reference

2 If you are applying for a multi-purpose plant, do you have a multi-product protocol in place to control the changes?

No ☐

Yes ☐ Provide a copy of your protocol to accompany this application

Document reference

3 Does Chapter V of the Industrial Emissions Directive (IED) apply to your activities?

No ☐

Yes ☐ Fill in the following

3a List the activities which are controlled under the IED

Installation reference	
Activities	

3b Describe how the list of activities in question 3a above meets the requirements of the IED

Document reference

Appendix 3 – Specific questions for the intensive farming sector

1 For each type of livestock, tell us the number of animal places you are applying for

Installation reference	
Type of livestock	Number of places

2 Is manure or slurry exported from the site?

No ☐

Yes ☐

3 Is manure or slurry spread on the site?

No ☐

Yes ☐

Appendix 4 – Specific questions for the clinical waste sector

If you are applying for an activity covered by the Waste Incineration Directive and wish to accept clinical waste you should fill in questions 1, 2 and 3 of this appendix.

Note: If your procedures are fully in line with the standards set out in EPR5.07 then you should tick the 'yes' box and provide the procedure reference. There is no need for you to supply a copy of the procedure.

1 Are pre-acceptance procedures in place that are fully in line with the appropriate measures set out in section 2.2 of EPR 5.07 and which are used to assess a waste enquiry before it is accepted at the installation?

No ☐ Provide justification for departure from EPR 5.07 and submit a copy of the procedures

Document reference

Yes ☐ Document reference

2 Are waste acceptance procedures in place that are fully in line with the appropriate measures set out in section 2.2 of EPR 5.07, and which are used to cover issues such as loads arriving and being inspected, sampling waste, rejecting waste, and keeping records to track waste?

No ☐ Provide justification for departure from EPR 5.07 and submit a copy of the procedures

Document reference

Yes ☐ Document reference

3 Are waste storage, handling and dispatch procedures, and infrastructure in place that are fully in line with the appropriate measures set out in section 3.2 of EPR 5.07?

No ☐ Provide justification for departure from EPR 5.07 and submit a copy of the procedures

Document reference

Yes ☐ Document reference

4 Are monitoring procedures in place that are fully in line with the appropriate measures set out in section 3.3 of EPR 5.07?

No ☐ Provide justification for departure from EPR 5.07 and submit a copy of the procedures

Document reference

Yes ☐ Document reference

5 Are you proposing to either

- accept an additional waste not included in Table 2.1 of section 2.1 of EPR 5.07, or
- apply a permitted activity to a waste other than that identified for that waste in Table 2.1?

No ☐

Yes ☐ Provide justification

Document reference

6 Please provide a summary description of the treatment activities undertaken on the installation. This should cover the general principles set out in section 2.1.4 of EPR 5.07

Document reference

7 Please provide layout plans detailing the location of each treatment plant and main plant items and process flow diagrams for the treatment plant

Document reference

Appendix 5 – Specific questions for the hazardous and non-hazardous waste recovery and disposal sector

Note: If your procedures are fully in line with the standards set out in SGN 5.06 then you should tick the 'yes' box and provide the procedure reference. There is no need for you to supply a copy of the procedure.

1 Are pre-acceptance procedures in place that are fully in line with the appropriate measures set out in section 2.1.1 of SGN 5.06, and which are used to assess a waste enquiry before it is accepted at the installation?

No ☐ Provide justification for departure from SGN 5.06 and submit a copy of the procedures

Document reference

Yes ☐ Document reference

2 Are waste acceptance procedures in place that are fully in line with the appropriate measures set out in section 2.1.2 of SGN 5.06, and which are used to cover issues such as loads arriving and being inspected, sampling waste, rejecting waste, and keeping records to track waste?

No ☐ Provide justification for departure from SGN 5.06 and submit a copy of the procedures

Document reference

Yes ☐ Document reference

3 Are waste storage procedures and infrastructure in place that are fully in line with the appropriate measures set out in section 2.1.3 of SGN 5.06?

No ☐ Provide justification for departure from SGN 5.06 and submit a copy of the procedures

Document reference

Yes ☐ Document reference

4 Provide a layout plan giving details of where the installation is based, the infrastructure in place (including areas and structures for separately storing types of waste which may be dangerous to store together) and capacity of waste storage areas and structures

Document reference

5 Provide a summary of the treatment activities carried out on the installation. This should cover the general principles set out in section 2.1.4 of SGN 5.06 and the specific principles set out in sections 2.1.5 to 2.1.15 as appropriate of SGN 5.06

Document reference

6 Provide layout plans giving details of where each treatment plant is based, the main items at each plant, and process flow diagrams for the treatment plant

Document reference or references

Appendix 6 – Specific questions for the waste incineration sector

If you are proposing to accept clinical waste please also fill in questions 1, 2 and 3 of appendix 4 above.

1a Do you run incineration plants as defined by Chapter IV of the Industrial Emissions Directive (IED)?

No ☐ You do not need to answer any other questions in this appendix

Yes ☐ IED applies

1b Are you subject to IED as an incinerator or co-incinerator?

As an incinerator ☐

As a co-incinerator ☐

2 Do any of the installations contain more than one incineration line?

No ☐ Now go to section 4

Yes ☐

3 How many incineration lines are there within each installation?

Fill in a separate table for each installation

Installation reference	
Number of incineration lines within the installation	
Reference identifiers for each line	

You must provide the information we ask for in questions 4, 5 and 6 below in separate documents. The information must at least include all the details set out in section 2 ('Key Issues') of TGN S5.01 (under the sub heading 'European legislation and your application for an EP Permit').

You must answer questions 7 to 13 on the form below.

4 Describe how the plant is designed, equipped and will be run to make sure it meets the requirements of IED, taking into account the categories of waste which will be incinerated

Document reference

5 Describe how the heat created during the incineration and co-incineration process is recovered as far as possible (for example, through combined heat and power, creating process steam or district heating)

Document reference

6 Describe how you will limit the amount and harmful effects of residues and describe how they will be recycled where this is appropriate

Document reference

For each line identified in question 3, answer questions 7 to 13 below

Question 3 identifier, if necessary

7 Do you want to take advantage of the Article 45 (1)(f) allowance (see below) if the particulates, CO or TOC continuous emission monitors (CEM) fail?

No ☐

Yes ☐ This allows 'abnormal operation' of the incineration plant under certain circumstances when the CEM for releases to air have failed. Annex VI, Part 3(2) sets maximum half hourly average release levels for particulates (150mg/m^3), CO (normal ELV) and TOC (normal ELV) during abnormal operation.

Describe the other system you use to show you keep to the requirements of Article 13(4) (for example, using another CEM, providing a portable CEM to insert if the main CEM fails, and so on).

Appendix 6 – Specific questions for the waste incineration sector, continued

8 Do you want to replace continuous HF emission monitoring with periodic hydrogen fluoride (HF) emission monitoring by relying on continuous hydrogen chloride (HCl) monitoring as allowed by IED Annex VI, Part 6 (2.3)?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you control hydrogen chloride and keep it to a level below the HCl ELVs.

No ☐

Yes ☐ Please give reasons for doing this

9 Do you want to replace continuous water vapour monitoring with pre-analysis drying of exhaust gas samples, as allowed by IED Annex VI, Part 6 (2.4)?

Under this you do not have to continuously monitor the amount of water vapour in the air released if the sampled exhaust gas is dried before the emissions are analysed.

No ☐

Yes ☐ Please give your reasons for doing this

10 Do you want to replace continuous hydrogen chloride (HCl) emission monitoring with periodic HCl emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen chloride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 6 – Specific questions for the waste incineration sector, continued

11 Do you want to replace continuous HF emission monitoring with periodic HF emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

12 Do you want to replace continuous SO_2 emission monitoring with periodic sulphur dioxide (SO_2) emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for sulphur dioxide if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

13 If your plant uses fluidised bed technology, do you want to apply for a derogation of the CO WID ELV to a maximum of 100 mg/m³ as an hourly average, as allowed by IED Annex VI, Part 3?

No ☐

Does not apply ☐

Yes ☐ Please give your reasons for doing this

Appendix 7 – Specific questions for the landfill sector

1 Provide your Environmental Setting and Installation Design (ESID) report

Document reference

2 Provide your hydrogeological risk assessment (HRA) for the site

Document reference

3 Provide your stability risk assessment (SRA) for the site

Document reference

4 Provide your landfill gas risk assessment (LFGRA) for the site

Document reference

We have developed templates for these four reports which can be found within H1 – Landfill Annex.

5 Provide your proposed plan for closing the site and your procedures for looking after the site once it has closed

Document reference

Application for an environmental permit Part C5 – Varying a permit to become a mining waste operation permit or varying a bespoke mining waste permit

Fill in this part of the form, together with part A, part C2 and part F1, if you are applying to vary (change) the conditions or any other part of the permit. Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or making changes to existing ones).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

It will take less than two hours to fill in this part of the application form.

Contents

1 What activities are you applying to vary?
2 Waste-management plan
3 External emergency plans
4 Additional information
5 How to contact us

1 What activities are you applying to vary?

1a Tick the relevant box below (to see the full description of each activity see the guidance notes on part C5)

Management of any extractive waste in a Category A mining waste facility ☐

Management of hazardous waste ☐

Management of non-inert, non-hazardous extractive waste that includes a mining waste facility ☐

Management of non-inert, non-hazardous extractive waste that does not include a mining waste facility ☐

Management of inert extractive waste that includes a point-source discharge to water ☐

Management of inert extractive waste by passive treatment that is controlled by the conditions for the discharge set in the permit; for example, a settlement pond that becomes part of the site restoration when dry ☐

2 Waste-management plan

Tick the box to confirm that you have filled in and attached the relevant waste-management plan template (see the guidance notes on part C5) ☑

3 External emergency plans (for Category A mining waste facilities only)

Please provide the information we need so the relevant emergency planner can draw up an external emergency plan for the mining-waste facility or facilities.

Document reference

4 Additional information

4a Does the mining waste operation include one or more inert mining waste facilities?

No ☐

Yes ☐ Provide the number of inert mining waste facilities

4 Additional information, continued

4b Sector category

Tick the correct category below:

Construction minerals ☐

Metallic minerals ☐

Industrial minerals ☐

Energy minerals ☐

Other sectors ☐ Please provide details below

Water discharge

4c Will the mining waste operation include an integral water discharge regulated facility?

No ☐

Yes ☐ Provide reference number

4d Will the mining waste operation include an integral groundwater regulated facility?

No ☐

Yes ☐ Provide reference number ER-EPRA-W1-WMP-005

5 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

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If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Application for an environmental permit Part C6 – Variation to a bespoke water discharge activity and groundwater (point source) activity

Environment Agency

Fill in this part of the form, together with part C2 and part F2, if you are applying to vary (change) the conditions or any other part of the permit. Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or making changes to existing ones).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

It will take less than three hours to fill in this part of the application form.

Contents

1 About the effluent – details and type
2 How long will you need to discharge the effluent for?
3 Discharge options
4 How much do you want to discharge?
5 Intermittent sewage discharges
6 How will the effluent be treated?
7 What will be in the effluent?
8 Monitoring arrangements
9 Emissions of substances not controlled by emission limits management plan
10 Design criteria
11 Where will the effluent discharge to?
12 How to contact us
Appendix 1 – Discharges to a borehole or well
Appendix 2 – Discharges into land
Appendix 3 – Discharges onto land
Appendix 4 – Discharges to tidal river, tidal stream, estuary or coastal waters
Appendix 5 – Discharges to non-tidal river, stream or canal
Appendix 6 – Discharges to a lake or pond

About the effluent – details and type

From the list below, choose which type of effluent you are applying for on this form and answer the questions shown in Table 1.

You must fill in a separate copy of this form and the appropriate appendix or appendices for each type of effluent you plan to discharge.

Table 1 – About the effluent

Type of effluent	Please tick box	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Domestic sewage – 20 m^3 a day or more discharged to surface water or – 15 m^3 a day or more discharged to groundwater	☐	All	a, b, c, d	a, b	b,f	–	All	b,d,e	b, d*, e*, f*, g	All	b, c, d, e	All
Intermittent settled storm sewage	☐	All	a, b	–	–	a, b, e, f, g, h, l, m	All	a, d, e	b, g	All	a, b, c, d, e	All
Intermittent combined sewer overflow	☐	All	a, b	–	–	c, d, e, f, g, h, i, m	All	a, d, e	b, g	All	a, b, c, d, e	All
Intermittent emergency overflow	☐	All	a, b	–	–	j, k, l	All	a, d, e	b, g	All	a, b, c, d, e	All
Sewage – water company WwTW final effluent	☐	All	a, b	–	a, f (b is optional)	–	All	a, b, c, d, e	a, b, c, d*, e*, f*, g (See note below)	All	a, b, c, d, e	All
Trade – known volume	☑	All	a, b, c, d	a, b	b, c, f	–	All	b, c, d, e, f	b, d*, e*, f*, g (See note below)	All	b, c, d, e	All
Trade – rainfall dependent	☐	All	a, b	–	b, c, f	–	All	b, c, d, e	b, d*, e*, f*, g (See note below)	All	b, c, d, e	All
Trade – returned abstracted water (including ground source heating and cooling schemes)	☐	All	a, b, c, d	–	b, c, f	–	All	b, c, d, e, f, g	a, b, d*, e*, f*, g (See note below)	All	b, c, d, e	All
Mixed effluent – all effluent volumes	☐	All	a, b, c, d	a, b	b, c, f	–	All	b*, d*, e* (See note below)	b, d*, e*, f*, g (See note below)	All	b, c, d, e	All
Mixed effluent – containing any rainfall dependent effluent	☐	All	a, b	a, b	b, c, d, e, f	–	All	b, c, d, e, f	b, d*, e*, f*, g (See note below)	All	b, c, d, e	All

*Check the relevant question and our guidance notes on part C6 to see if you need to give an answer.

1 About the variation you are applying for

1a Give a brief description of the changes you want to make to your permit

Retained non-hazardous proppant fluid left within the target formation upon completion of the proppant squeeze.

1b Give this effluent a unique name

You must use this name to identify this effluent throughout this application and all associated documents.

Name: Retained Proppant Fluid

1c Please tick if this is a release from a dam, weir or sluice ('reservoir release') under Schedule 21 of the EPR meaning of water discharge activity ☐

1d Give the UK Standard Industrial Classification of Economic Activities 2007 (SIC 2007) code which best describes the main activity leading to this discharge

For private domestic dwellings use Z for section and A for class.

Section:

Class or sub class:

2 About the effluent – how long will you need to discharge the effluent for?

2a What date do you want the permit for this effluent to start?

(DD/MM/YYYY): 01/09/2016

Please note that charges will start on this date, even if you have not started to discharge, unless you contact us to change (delay) the start date (see the guidance notes on part C6).

2b Is the discharge time limited?

Yes ☐ Please give the date you expect the discharge to end but please note that your permit will not end on that date and you will still need to notify us to surrender the permit (DD/MM/YYYY)

No ☐

2c Will the discharge take place all year?

Yes ☐

No ☐ Please give details of the months when you will make the discharge: As yet undetermined

2d Will the discharge take place on more than six days in any year?

Yes ☐

No ☐

3 Discharge options

3a How far away is the nearest sewer (in metres)? Not Applicable

You will need to check this with your sewerage undertaker (usually your local water company) and you may also need to check if it is possible to connect to a private sewer.

3b You must explain why you cannot discharge your effluent into a sewer. You must show the extra cost of connecting to a sewer compared to the treatment you propose, and details of any physical obstacles; for example, roads, railways, rivers or canals. Where you are proposing a discharge from a private sewage treatment system in an area where it appears reasonable to discharge your effluent into a sewer, you must, as a minimum, send us evidence that you have approached the sewerage undertaker, and send us their formal response regarding connection.

The guidance notes on part C6 will help you understand what information you need to provide in answer to this question.

Document reference where you have given this justification: ER-EPRA-W1-WMP-005

4 How much do you want to discharge?

4a What is the daily dry weather flow (in cubic metres)?

4b What is the maximum volume of effluent you will discharge in a day (in cubic metres)? 180.00

Show how you calculated the figure given in the box below and continue on a separate sheet if necessary, giving a reference for the extra sheet.

In accordance with the Waste Management Plan the maximum discharge per proppant squeeze is anticipated to be 180m3. for the purpose of this application it is assumed (worst case) that all fluid will be retained in the formation i.e. 180m3 although it is likely that between 30% and 50% will be retained within the formation.

Document reference for any extra sheet or sheets used for question 4b

4c What is the maximum rate of discharge (in litres a second)?

4d What is the maximum volume of non-rainfall dependent effluent you will discharge in a day (in cubic metres)?

4e What is the maximum rate of rainfall dependent discharge (in litres per second)?

4f For each answer in question 4, show how you worked out the figure on a separate sheet.

Document reference of the extra sheet

5 Intermittent sewage discharges

5a For each answer to b to j below, show how you worked out the figure on a separate sheet.

Document reference of the extra sheet

5b What is the total volume of the storm tank storage (in cubic metres)?

5c What is the pass forward flow at the settled storm overflow setting (in litres per second)?

5d What is the pass forward flow at the storm overflow setting (in litres per second)?

5e What is the total volume of storage (in cubic metres)?

If the effluent is screened answer the relevant questions from e to h below, if it is not screened go to question i.

5f Is the discharge screened?

Yes ☐ Answer the relevant questions from 5g to 5j

No ☐ Go to 5k

5g What is the mesh screen spacing (in millimetres)?

5h What is the maximum flow through the mesh screen (in litres per second)?

5i What is the bar screen spacing (in millimetres)?

5j What is the maximum flow through the bar screen (in litres per second)?

5k Is the overflow constructed to good engineering design?

Yes ☐

No ☐

5l What is the emergency storage capacity of the sewer and wet well (in cubic metres)?

5m What is the storage time within the sewer and the wet well above the top water level at dry weather flow (in hours and minutes)?

5n What is the pass forward flow at the pumping station (in litres per second)?

6 How will the effluent be treated?

6a Do you treat your effluent?

Yes ☐ Now go to question 6b

No ☐ You must explain why the effluent will not be treated

Document reference for where you have given this justification

6b Fill in Table 2 for each stage of the treatments carried out on your effluent in the order in which they are carried out

Table 2 – Treatments carried out on your effluent

Order of treatment	Code number	Description
First		
Second		
Third		
Fourth		

Continue on a separate sheet if you need more rows. If you prefer, you can also send us an overall design for the whole treatment process.

Document reference for the extra sheet

7 What will be in the effluent?

For all applications, whether to surface water, or onto or into ground, you should still check to see if your discharge is likely to contain any of the substances listed in Horizontal Guidance H1 Environmental Risk Assessment Annex D, Appendix A and answer the relevant questions for your discharge below.

7a Are any of the substances listed in Horizontal Guidance H1 Environmental Risk Assessment Annex D, Appendix A likely to enter the sewerage system upstream of the discharge through any authorised or known inputs?

Yes ☐

No ☐

7b Are any of the substances listed in Horizontal Guidance H1 Environmental Risk Assessment Annex D, Appendix A added to or present in the effluent as a result of the activities on the site?

Yes ☐

No ☐

7c Have any of the substances listed in Horizontal Guidance H1 Environmental Risk Assessment Annex D, Appendix A been detected in samples of the effluent or in the sewerage catchment upstream of the discharge?

Yes ☐

No ☑

7d Are there any other harmful or hazardous substances in your effluent not mentioned in Horizontal Guidance H1 Environmental Risk Assessment Annex D, Appendix A?

Yes ☐

No ☑

7e If you have answered yes to any of the above, give details, using the headings below, on a separate sheet.

You must also send us any information on samples that you may have.

Document reference of this sheet

Substance	Unit	Maximum concentration	Minimum concentration	Average concentration	Number of samples	Total or dissolved

7f Give the maximum temperature of your discharge in degrees Celsius

60.00

7g The maximum expected temperature change compared to the incoming water supply

Increase in degrees Celsius

Decrease in degrees Celsius

8 Monitoring arrangements

Note: If your effluent has a maximum volume of **no more than** 50 cubic metres a day you do not need to complete question 8d or 8e.

8a What is the national grid reference of the inlet sampling point?

8 Monitoring arrangements, continued

8b What is the national grid reference of the effluent sample point? SE 96772 11102

8c Do you have an Urban Waste Water Treatment Directive final effluent sampling point?

Yes ☐ Please provide the national grid reference (for example, SJ 12345 67890)

No ☐

8d What is the national grid reference of the flow monitoring point?

8e Does the flow monitor have an MCERTS certificate?

Yes ☐ Please give the certificate number

No ☐

8f Do you have a UV disinfection efficacy monitoring point?

Yes ☐ Please provide the national grid reference

No ☐

8g You should clearly mark on the plan the locations of any of the above that apply to this effluent

Document reference for the plan

9 Emissions of substances not controlled by emission limits management plan

9a Does your H1 – Environmental Risk Assessment show that emissions of substances not likely to be controlled by emission limits in your permit are an important issue?

Yes ☐

No ☐

9b If yes, have you got an emissions management plan which meets the requirements set out in our guidance document 'How to comply'?

Yes ☐ Please send us your emissions management plan

Document reference for the plan

No ☐

10 Design criteria

10a Sewer modelling report (for discharges of final effluent from a water company WwTW or intermittent sewage discharges)

You must carry out sewer modelling following the guidance in 'Horizontal Guidance Note H1 Annex E – Surface Water Discharges (complex)'. Send us details of how the modelling was carried out and the outcome.

Document reference for the report

10b Discharges to lakes, estuaries, coastal waters or bathing waters

You must carry out modelling following the guidance in 'H1 Risk Assessment Horizontal Guidance Note H1 Annex E – Surface Water Discharges (complex)'. Send us details of how the modelling was carried out and the outcome.

Document reference for the report

10c Discharges to non-tidal rivers

You may need to carry out modelling following the guidance in 'H1 Risk Assessment Horizontal Guidance Note H1 Annex E – Surface Water Discharges (complex)'. Have you carried out any river quality modelling?

Yes ☐ Send us details of how the modelling was carried out and the outcome.

Document reference for the report

No ☑

10d Discharges to groundwater

You must carry out a groundwater quantitative risk assessment following the guidance in 'H1 Risk Assessment Horizontal Guidance Note H1 Annex J – Groundwater'. Send us details of how the modelling was carried out and the outcome.

For groundwater remediation schemes you must send us a site-specific remediation strategy which has been agreed with the local Environment Agency Groundwater and Contaminated Land Team.

Document reference for the report ER-EPRA-W1-ERA-007

10 Design criteria, continued

10e Environmental impact assessment

Have you carried out an environmental impact assessment?

Yes ☐

Send us details of how the assessment was carried out and the outcome.

Document reference for the report

No ☑

11 Where will the effluent discharge to?

11a Mark in Table 3 where this effluent discharges to and fill in the relevant questions and appendix or appendices.

You must use the name you gave to this effluent in answer to question 1b of this form when filling in your relevant appendix or appendices.

Table 3 – Where the effluent discharges to

Receiving environment	X	Relevant questions below	Relevant appendix
Borehole or well	X	b, c	1
Into land (for example, through a drainage system)		b, c, d	2
Onto land		b, c, d	3
Tidal river, tidal stream, estuary or coastal waters		b, c, d	4
Non-tidal river, stream or canal		b, c, d	5
Lake or pond		b, c, d	6

11b Is this effluent discharged through more than one outlet?

Yes ☑

No ☐

11c If yes, on a separate sheet, give details of the circumstances under which each outlet would be used by this effluent.

Document reference for this extra sheet ER-EPRA-W1-WMP-005

11d If you answered yes to question b above make sure you show clearly on your discharge point appendix or appendices and site plan that this one effluent can discharge to more than one discharge point.

You must give us all the details we need for each of the discharge points used by this effluent.

12 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Plain English Campaign's Crystal Mark does not apply to appendices 1 to 6.

Appendix 1 – Discharges to a borehole or well (or other deep structure such as a mineshaft)

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

1 Give the discharge point a unique name
For example, 'Outlet 1' (you must use this name to identify the discharge point on the plan) Wressle-1 Well

2 Give the national grid reference of the discharge point SE96772 11102

3 Is the discharge to ground via a

Well ☐

Borehole ☐

Other deep structure ☑ Please give details

Proppant Squeeze

4 What is/or will be the total depth of the borehole or well (in metres) below ground or other reference level (please specify the reference level you are using)? 2,025.00

5 Is the borehole or well or structure already constructed?

Yes ☑

No ☐

6 To what depth is the borehole or well or structure sealed with unperforated linings or casing (in metres) below your reference level?

7 Is any part of your discharge within 50 metres of another well, spring or borehole?

No ☐ Go to question 9

Yes ☑ Identify the location of the well, spring or borehole on the plan you have provided and answer question 8.

8 Is the other well, spring or borehole you have identified used to supply water?

No ☑

Yes ☐ You must describe what the water supplied is used for.

9 Does the borehole or well or structure into which you are intending to make your discharge intermittently or permanently contain standing water?

Yes ☐ Now answer question 10 and 11

No ☑ Only answer question 10

10 What is the highest level the standing water reaches in the borehole or well or structure (in metres) below your reference level?

11 If you answered yes to question 9 and your discharge falls into any of the following groups of activities please tick the appropriate box. If not just leave blank.

Injection of water containing substances resulting from the operations for exploration and extraction of hydrocarbons or mining activities ☐

Reinjection of pumped groundwater from mines and quarries or associated with the construction or maintenance of civil engineering works (includes the treatment and reinjection of contaminated groundwater for the purposes of remediation) ☐

Injection of natural gas or liquefied petroleum gas for storage purposes ☐

Construction, civil engineering and building works and similar activities on or in the ground (for example discharge arising from the grouting of old mineshafts) ☐

Appendix 1 – Discharges to a borehole or well (or other deep structure such as a mineshaft), continued

Discharges of small quantities of substances for scientific purposes for characterisation, protection (including use of substances as tracers) or remediation of groundwater, where such activities are not eligible for a registered exemption ☐

The artificial recharge or augmentation of a body of groundwater for the purposes of groundwater management ☐

Reinjection of pumped groundwater used for geothermal purposes (including ground source heat systems) ☐

Appendix 2 – Discharges into land

Answer the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

1 Give the discharge point a unique name
For example, 'Outlet 1' (you must use this name to identify the discharge point on the plan)

2 Give the national grid reference of the discharge point

3 Is your infiltration system new or existing?

New ☐ Now go to question 5

Existing ☐ Now go to question 4

4a When was it built?

4b Now answer questions 5–8 if you are able to, if not leave them blank and go to question 9.

5 Is your infiltration system designed and built to British Standard 6297:2007 + A1:2008?

Yes ☐

No ☐ Please provide details, on a separate sheet, of the design criteria used for your infiltration system

Document reference

6 On what date did you carry out a percolation test and dig a trial hole in line with British Standard 6297:2007 + A1:2008?
Date (DD/MM/YYYY)

7 What is your percolation value (Vp) result (in seconds per millimetre)? You must show in the table below how you worked out the percolation value.

	Trial 1	Trial 2	Trial 3	Average
Hole 1				
Hole 2				
Hole 3				
Hole 4				

8 What is the surface area of your infiltration system (in square metres)?

9 If known, mark on the plan you have provided the extent of the infiltration system

10 Is any part of your discharge within 50 metres of a well, spring or borehole?

No ☐

Yes ☐ Identify the location of the well spring or borehole on the plan you have provided and answer question 11.

11 Is the well spring or borehole you have identified used to supply water?

No ☐

Yes ☐ You must describe what the water supplied is used for.

12 Is any part of your infiltration system within 10 metres of a watercourse?

Yes ☐

No ☐

Identify the location of the watercourse on the plan you have provided for section 4 of part C6.

Appendix 3 – Discharges onto land

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

1 Give the discharge point a unique name
For example, 'Outlet 1' (you must use this name to identify the discharge point on the plan)

2 Give the national grid reference of the discharge point

3 Select from the table below the type of area where the effluent is disposed of

Area type	
Unlined reed bed	☐
Unlined grass plot	☐
Unlined wetland	☐
Other	☐ Please specify below

4 What is the surface area of the land used for your disposal (in square metres)?

5 Is any part of your discharge within 50 metres of a well, spring or borehole?

No ☐

Yes ☐ Identify the location of the well spring or borehole on the plan you have provided and answer question 6.

6 Is the well spring or borehole you have identified used to supply water?

No ☐

Yes ☐ You must describe what the water supplied is used for.

7 Is any part of your infiltration system within 10 metres of a watercourse?

Yes ☐

No ☐

Identify the location of the watercourse on the plan you have provided for section 4 of part C6.

Appendix 4 – Discharges to tidal river, tidal stream, estuary or coastal waters

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

1 Give the discharge point a unique name
For example, 'Outlet 1' (you must use this name to identify the discharge point on the plan)

2 Give the national grid reference of the discharge point

3 Give the name of the tidal river, tidal stream, estuary or area of coastal water if you know it

4 Is the discharge into a

Tidal river ☐

Tidal stream ☐

An estuary ☐

Coastal water ☐

5 Does the discharge reach the watercourse by flowing through a surface water sewer?

Yes ☐ Give the national grid reference where the discharge enters the surface water sewer

No ☐

6 Is the discharge point above the mean low water spring tide mark?

Yes ☐ Please explain, on a separate sheet, why the discharge cannot be made below this point

Document reference

No ☐

7 How is the effluent dispersed? For example, open pipe or diffuser system

If diffuser system go to question 8

8 Give details, on a separate sheet, of the design of the diffuser system

Document reference

Appendix 5 – Discharges to non-tidal river, stream or canal

Answer all the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

1 Give the discharge point a unique name
For example, 'Outlet 1' (you must use this name to identify the discharge point on the plan)

2 Give the national grid reference of the discharge point

3 Give the name of the watercourse, canal or the main watercourse it is a tributary of if you know it

4 Is the discharge into a

Non-tidal river ☐

Stream ☐

Canal ☐

5 Does the discharge reach the watercourse or canal by flowing through a surface water sewer?

Yes ☐ Give the national grid reference where the discharge enters the surface water sewer

No ☐

6 Does the watercourse dry up for part of the year?

Yes ☐

No ☐

Appendix 6 – Discharges to a lake or pond

Answer the questions below. Use a separate line for each effluent if more than one effluent discharges using this discharge point. Remember, when linking your effluent to a discharge point you must use the name you gave to your effluent in answer to question 1b in the effluent form.

1 Give the discharge point a unique name
For example 'Outlet 1' (you must use this name to identify the discharge point on the plan)

2 Give the national grid reference of the discharge point

3 Give the name of the lake or pond if you know it

4 Select from the following table the type of lake or pond you will be discharging to and answer the relevant questions.

Type of lake or pond		Relevant questions
Lake or pond which does not discharge into a river or watercourse or another pond which discharges into a river or watercourse	☐	Permit not required*
Lake or pond which does not discharge into a river or watercourse or another pond which discharges into a river or watercourse where you have had a notice served under paragraph 5 of Schedule 21 of the Environmental Permitting (England and Wales) Regulations 2010	☐	5, 6, 7
Lake or pond which discharges into a river or watercourse	☐	5, 6, 7

*Unless a Notice has been served under paragraph 5 of Schedule 21 of the Environmental Permitting (England and Wales) Regulations 2010

5 What is the surface area of the lake or pond (in square metres)?

6 What is the maximum depth of the lake or pond (in metres)?

7 What is the average depth of the lake or pond (in metres)?

Application for an environmental permit Part F1 – Opra, charges and declarations

Fill in this part for all applications for installations, waste operations, mining waste operations and groundwater discharges onto land. Please check that this is the latest version of the form available from our website.

For applications for water discharge and point source groundwater discharge activities you need to fill in part F2 instead.

Please read through this form and the guidance notes that came with it. Please write clearly in the answer spaces.

It will take less than two hours to fill in this part of the application form.

Contents

1 Working out charges
2 Opra
3 Payment
4 The Data Protection Act 1998
5 Confidentiality and national security
6 Declaration
7 Application checklist
8 How to contact us
9 Where to send your application

1 Working out charges (you must fill in this section)

You have to submit an application fee with your application. You can find out the charge by either looking at the relevant standard rules permit page, the 'Making an application' webpage at http://www.environment-agency.gov.uk/business/topics/permitting/32318.aspx, or the current environmental permitting charging scheme on our website at www.environment-agency.gov.uk which sets out our charges under the Environmental Permitting Regulations. Please remember that the charges are revised on 1 April each year and that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

Note: for Opra charged Tier 3 Facilities you also need to complete an Opra profile (see section 2).

Table 1 – Working out charges

Type of application	Variation to A Mining Waste Operation Permit			
	Summary of charges			
Tier 2 facilities (including Part A(2) and Part B; see guidance notes on part F1)	Charge identifier	Number of facilities	Charge for each facility (£)	Charges due (£)
Mining Waste Operation, including a		1	1,960.00	1,960.00
Non-hazardous Mining Waste Facility				
Tier 3 facilities				
Total Opra charging score for installations	50.00	× charge multiplier	206.00	= 10,300.00
Total Opra charging score for waste operations		× charge multiplier		=
Total Opra charging score for mining waste facilities		× charge multiplier		=
Other charges				
Total charges due				12,260.00

2 Opra (does not apply to standard facilities, any other tier 2 permit applications (e.g. groundwater land spreading activities), or water-discharge or groundwater point source discharge activities)

If you are submitting a bespoke application, you must include a completed electronic copy in Excel of the current Opra spreadsheet.

For most variations, full and partial surrenders you will need to submit a copy of your current Opra profile based on your existing profile, not any new profile following the variation or surrender. Check the latest charges guidance for further advice.

For transfers you will need to submit a revised Opra profile to include your own operator performance. Note: this will not change the set transfer fee.

Tick this box to confirm that you have included the OPRA spreadsheet ☑

3 Payment

Tick below to show how you have paid.

Cheque	☐	
Postal order	☐	
Cash	☐	Tick below to confirm you are enclosing cash with the application
Credit or debit card	☐	
Electronic transfer (for example, BACS)	☑	
Remittance number	PSCAPPEGDON001	
Date paid (DD/MM/YYYY)	03/06/2016	

How to pay

Paying by cheque, postal order or cash

Cheque details

Cheque made payable to		
Cheque number		
Amount	£	12,260.00

You should make cheques or postal orders payable to 'Environment Agency' and make sure they have 'A/c Payee' written across them if it is not already printed on.

Please write the name of your company and application reference number on the back of your cheque or postal order.
We will not accept cheques with a future date on them.

We do not recommend sending cash through the post. If you cannot avoid this, please use a recorded delivery postal service and enclose your application reference details. Please tick the box below to confirm you are enclosing cash.

I have enclosed cash with my application ☐

Paying by credit or debit card

If you are paying by credit or debit card, either we can call you or you can fill in the separate form CC1 and enclose it with the application. We will destroy your card details once we have processed your payment. We can accept payments by Visa, MasterCard or Maestro card only.

Please call me to arrange payment by debit or debit card ☐

I have enclosed form CC1 with my application ☐

Paying by electronic transfer BACS reference

If you choose to pay by electronic transfer you will need to use the following information to make your payment.

Company name:	Environment Agency
Company address:	Income Dept 311, PO Box 263, Peterborough, PE2 8YD
Bank:	Citigroup Centre
Address:	Canada Square, London, E14 5LB
Sort code:	08-33-00
Account number:	12800543
Payment reference number:	PSCAPPXXXXXYYY

You need to create your own reference number. It should begin with PSCAPP (to reflect that the application is for a permitted activity) and it should include the first five letters of the company name (replacing the X's in the above reference number) and a unique numerical identifier (replacing the Y's in the above reference number). The reference number that you supply will appear on our bank statements.

3 Payment, continued

You should also email your payment details and reference number to FSC-Income@environment-agency.gov.uk or fax it to 01733 464 892.

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23 CITI0833 0012 8005 78 and our SWIFTBIC number is CITI GB2LXXX.

If you do not quote your reference number, there may be a delay in processing your payment and application.

Now read section 4 below.

4 The Data Protection Act 1998

We, the Environment Agency, will process the information you provide so that we can:

- deal with your application;
- make sure you keep to the conditions of the licence, permit or registration;
- process renewals; and
- keep the public registers up to date.

We may also process or release the information to:

- offer you documents or services relating to environmental matters;
- consult the public, public organisations and other organisations (for example, the Health and Safety Executive, local authorities, the emergency services, the Department for Environment, Food and Rural Affairs) on environmental issues;
- carry out research and development work on environmental issues;
- provide information from the public register to anyone who asks;
- prevent anyone from breaking environmental law, investigate cases where environmental law may have been broken, and take any action that is needed;
- assess whether customers are satisfied with our service, and to improve our service; and
- respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (if the Data Protection Act allows). We may pass the information on to our agents or representatives to do these things for us.

Now read section 5 below.

5 Confidentiality and national security

We will normally put all the information in your application on a public register of environmental information. However, we may not include certain information in the public register if this is in the interests of national security, or because the information is confidential.

You can ask for information to be made confidential by enclosing a letter with your application giving your reasons. If we agree with your request, we will tell you and not include the information in the public register. If we do not agree with your request, we will let you know how to appeal against our decision, or you can withdraw your application.

Only tick the box below if you wish to claim confidentiality for your application

Please treat the information in my application as confidential ☐

National security

You can tell the Secretary of State that you believe including information on a public register would not be in the interests of national security. You must enclose a letter with your application telling us that you have told the Secretary of State and you must still include the information in your application. We will not include the information in the public register unless the Secretary of State decides that it should be included.

You can find guidance on national security in 'Core Environmental Permitting Guidance' published by Defra and available via our website at www.environment-agency.gov.uk.

You cannot apply for national security via this application.

Now go to section 6.

6 Declaration

If you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2010.

A relevant person should make the declaration (see guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

Each individual (or individual trustee) who is applying for their name to appear on the permit must complete this declaration. You will have to print a separate copy of this page for each additional individual to complete.

If you are transferring all or part of your permit, both you and the person receiving the permit must make the declaration. You must fill in the declaration directly below; the person receiving the permit must fill in the declaration under the heading 'For transfers only'.

6 Declaration, continued

Note: If you are unable to trace one or more of the current permit holders please see below under the transfers declaration.

I declare that the information in this application is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

I confirm that my standard facility will fully meet the rules that I have applied for (this only applies if the application includes standard facilities)	☐
Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below	☑
Tick this box if you do not want us to use information from any ecological survey that you have supplied with your application (for further information please see the guidance notes on part F1)	☐

Name

Title (Mr, Mrs, Miss and so on)	Mr
First name	Mark
Last name	Abbot
on behalf of (if relevant; for example, a company or organisation and so on)	Egdon Resources UK Limited
Position (if relevant; for example, in a company or organisation and so on)	Managing Directors
Today's date (DD/MM/YYYY)	23/05/2016

For transfers only – declaration for person receiving the permit

A relevant person should make the declaration (see guidance notes on part F1).

I declare that the information in this application to transfer an environmental permit to me is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

Note: If you cannot trace a person or persons holding the permit you may be able to transfer the permit without their declaration as above. Please contact us to discuss this and supply evidence in your application to confirm you are unable to trace one or all of the permit holders.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

Tick this box to confirm that you understand and agree with the declaration above	☐

Name

Title (Mr, Mrs, Miss and so on)	
First name	
Last name	
on behalf of (if relevant; for example, a company or organisation and so on)	
Position (if relevant; for example, in a company or organisation and so on)	
Today's date (DD/MM/YYYY)	

Now go to section 7

7 Application checklist (you must fill in this section)

If your application is not complete we will return it to you. If you aren't sure about what you need to send, speak to us before you submit your application.

You must do the following:

Complete legibly all parts of this form that are relevant to you and your activities	☑
Identify relevant supporting information in the form and send it with the application	☑

7 Application checklist (you must fill in this section), continued

List all the documents you are sending in the table below.
If necessary, continue on a separate sheet. This separate sheet also needs to have a reference number and you should include it in the table below ☑

For new permits or any changes to the site plan, provide a plan that meets the standards given in the guidance note on part F1 ☑

Provide a supporting letter for any claim that information is confidential ☐

Get the declaration completed by a relevant person (not an agent) ☑

Send the correct fee ☑

Question reference	Document title	Document reference
Form C2 - 3d	Waste Management Plan (Appendix 2)	ER-EPRA-W1-WMP-005
Form C2 - 5a	Site Location Plan	ER-EPRA-W1-SP-004
Form C2 - 5c	Non Technical Summary	ER-EPRA-W1-NTS-003
Form C2 - 5d	Site Condition Report	ER-EPRA-W1-SCR-006
Form C2 - 6	Environmental Risk Assessment	ER-EPRA-W1-ERA-007
Form C5 - 4d	Waste Management Plan	ER-EPRA-W1-WMP-005

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

9 Where to send your application (for how many copies to send see the guidance note on part F1)

Please send your filled in application form to:

Permitting Support Centre
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Do you want all information to be sent to you by email?

Please tick this box if you wish to have all communication about this application sent via email (we will use the details provided in Part A) ☐

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form? _____

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY) _____

Our reference number _____

Payment received?

No ☐

Yes ☐ Amount received

£ _____

Application for an environmental permit Part F2 – Charging for discharges (C for D) charges and declarations

Fill in this part for applications for water discharge and point source groundwater discharge activities only. Please check that this is the latest version of the form available from our website.

Please read through this form with the guidance notes that came with it. Please write clearly in the answer spaces.

It will take less than two hours to fill in this part of the application form.

Contents

1 Working out charges
2 Water discharge activity and groundwater point source discharges
3 Payment
4 The Data Protection Act 1998
5 Confidentiality and national security
6 Declaration
7 Application checklist
8 How to contact us
9 Where to send your application

1 Working out charges (you must fill in this section)

Summary of charges				
Type of water discharge activity or groundwater activity	Standard charge or reduced charge	Number of activities at this charge rate	Charge for each facility (£)	Charges due (£)
Discharge borehole/well	Standard Charge	1	885.00	885.00
Other charges				0.00
Ground source heating and cooling system scheme (water resources charge)				0.00
			Total Charge	885.00

You have to submit an application fee with your application. To find out the charge:

- Refer to the relevant standard rules permit page;
- Visit the 'Making an application' webpage at http://www.environment-agency.gov.uk/business/topics/permitting/32318.aspx; or
- Visit the current environmental permitting charging scheme on our website at www.environment-agency.gov.uk which sets out our charges under the Environmental Permitting Regulations.

Please remember that the charges are revised on 1 April each year and that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

2 Water discharge activity and groundwater activity point source discharges

The application charge is a fixed charge, although two rates exist: standard and reduced. The reduced application charge is applicable where the effluent is:

- sewage effluent where the proposed volume is five cubic metres or less per day;
- sewage effluent which contains trade effluent or other matter where the proposed volume is five cubic metres or less per day;
- trade effluent from cooling or heat exchange where the proposed volume is ten cubic metres or less per day;
- surface water not containing trade effluent;
- site drainage;
- effluent or substance discharged or disposed onto or into land where the proposed volume is five cubic metres or less per day and discharge is on not more than six days per year or any such equivalent disposal.

The standard application charge applies in all other situations.

2 Water discharge activity and groundwater activity point source discharges, continued

The charge applies to each discharge you will be making. Therefore two discharges of sewage effluent of five cubic metres a day will attract two reduced rate charges.

Please contact us, using one of the options in section 8, for details of current reduced and standard application charges. Please note that the charges are revised on 1 April each year.

3 Payment

Tick below to show how you have paid.

Cheque	☐
Postal order	☐
Cash	☐
Credit or debit card	☐
Electronic transfer (for example, BACS)	☑
Remittance number	PSCAPPEGDON001
Date paid (DD/MM/YYYY)	03/06/2016

How to pay

Paying by cheque, postal order or cash

Cheque details

Cheque made payable to	
Cheque number	
Amount	£ 885.00

You should make cheques or postal orders payable to 'Environment Agency' and make sure they have 'A/c Payee' written across them if it is not already printed on.

Please write the name of your company and application reference number on the back of your cheque or postal order.

We will not accept cheques with a future date on them.

We do not recommend sending cash through the post. If you cannot avoid this, please use a recorded delivery postal service and enclose your application reference details. Please tick the box below to confirm you are enclosing cash.

I have enclosed cash with my application ☐

Paying by credit or debit card

If you are paying by credit or debit card, either we can call you or you can fill in the separate form CC1. We will destroy your card details once we have processed your payment. We can accept payments by Visa, MasterCard or Maestro card only.

Please call me to arrange payment by debit or debit card ☐

I have enclosed form CC1 with my application ☐

Paying by electronic transfer BACS reference

If you choose to pay by electronic transfer you will need to use the following information to make your payment.

Company name:	Environment Agency
Company address:	Income Dept 311, PO Box 263, Peterborough, PE2 8YD
Bank:	Citigroup Centre
Address:	Canada Square, London, E14 5LB
Sort code:	08-33-00
Account number:	12800543
Payment reference number:	xxxxxxxxxxxxx

You should also email your payment details and reference number (this can be the customer reference, permit reference or an application reference from the pre-application stage) to FSC-Income@environment-agency.gov.uk or fax it to 01733 464 892.

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23 CITI0833 0012 8005 43 and our SWIFTBIC number is CITI GB2LXXX.

If you do not quote your reference number (this can be the customer reference, permit reference or an application reference from the pre-application stage), there may be a delay in processing your payment and application.

Now read section 4 below.

4 The Data Protection Act 1998

We, the Environment Agency, will process the information you provide so that we can:

- deal with your application;
- make sure you keep to the conditions of the licence, permit or registration;
- process renewals; and
- keep the public registers up to date.

We may also process or release the information to:

- offer you documents or services relating to environmental matters;
- consult the public, public organisations and other organisations (for example, the Health and Safety Executive, local authorities, the emergency services, the Department for Environment, Food and Rural Affairs) on environmental issues;
- carry out research and development work on environmental issues;
- provide information from the public register to anyone who asks;
- prevent anyone from breaking environmental law, investigate cases where environmental law may have been broken, and take any action that is needed;
- assess whether customers are satisfied with our service, and to improve our service; and
- respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (if the Data Protection Act allows). We may pass the information on to our agents or representatives to do these things for us.

Now read section 5 below.

5 Confidentiality and national security

We will normally put all the information in your application on a public register of environmental information. However, we may not include certain information in the public register if this is in the interests of national security, or because the information is confidential.

You can ask for information to be made confidential by enclosing a letter with your application giving your reasons. If we agree with your request, we will tell you and not include the information in the public register. If we do not agree with your request, we will let you know how to appeal against our decision, or you can withdraw your application.

Only tick the box below if you wish to claim confidentiality for your application

Please treat the information in my application as confidential ☐

National security

You can tell the Secretary of State that you believe including information on a public register would not be in the interests of national security. You must enclose a letter with your application telling us that you have told the Secretary of State and you must still include the information in your application. We will not include the information in the public register unless the Secretary of State decides that it should be included.

You can find guidance on national security in 'Core Environmental Permitting Guidance' published by Defra and available via our website at www.environment-agency.gov.uk.

You cannot apply for national security via this application.

Now go to section 6.

6 Declaration

If you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2010.

A relevant person should make the declaration (see guidance notes on part F2). An agent acting on behalf of an applicant is NOT a relevant person.

Each individual (or individual trustee) who is applying for their name to appear on the permit must complete this declaration. You will have to print a separate copy of this page for each additional individual to complete.

Note: If you are unable to trace one or more of the current permit holders please see below under the transfers declaration.

I declare that the information in this application is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

I confirm that my standard facility will fully meet the rules that I have applied for (this only applies if the application includes standard facilities) ☐

Tick this box to confirm that you understand and agree with the declaration above ☑

6 Declaration, continued

Tick this box if you do not want us to use information from any ecological survey that you have supplied with your application (for further information please see the guidance notes on part F2) ☐

Name

Title (Mr, Mrs, Miss and so on): Mr

First name: Mark

Last name: Abbot

on behalf of (if relevant; for example, a company or organisation and so on): Egdon Resources UK Limited

Position (if relevant; for example, a company or organisation and so on): Managing Director

Today's date (DD/MM/YYYY): 02/06/2016

7 Application checklist (you must fill in this section)

If your application is not complete we will return it to you. If you aren't sure about what you need to send, speak to us before you submit your application.

You must do the following:

Complete legibly all parts of this form that are relevant to you and your activities ☑

Identify relevant supporting information in the form and send it with the application. ☑

List all the documents you are sending in the table below. If necessary, continue on a separate sheet. This separate sheet also needs to have a reference number and you should include it in the table below ☑

For new permits or any changes to the site plan, provide a plan that meets the standards given in the guidance note on part F2 ☑

Provide a supporting letter for any claim that information is confidential ☐

Get the declaration completed by a relevant person (not an agent) ☑

Send the correct fee ☑

Part, section and question number	Document title	Document reference
Part C6 - 3b	Waste Management Plan	ER-EPRA-W1-WMP-005
Part C6 - 10d	Environmental Risk Assessment	ER-EPRA-W1-ERA-007
Part C6 - 11c	Waste Management Plan	ER-EPRA-W1-WMP-005

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.environment-agency.gov.uk

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

9 Where to send your application (for how many copies to send see the guidance note on part F2)

Please send your filled in application form to:

Permitting Support Centre
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF.

Do you want all information to be sent to you by email?

Please tick this box if you wish to have all communication about this application sent via email (we will use the details provided in Part A) ☐

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form? _____

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19118
Clarity approved by Plain English Campaign

For Environment Agency use only

Date received (DD/MM/YYYY)

_____

Our reference number

_____

Payment received?

No ☐

Yes ☐ Amount received

£ _____

Non-Technical Summary

Wressle Wellsite

Wressle-1

Hydrocarbon Production and Short Duration Well Operations, including Near Wellbore Treatments and Proppant Squeeze Operations

3rd June 2016

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CONTENTS

1. Introduction 5
1.1 Site Details 5
2. Scope 6
3. Definitions 7
4. Environmental Legislation and Applicability 9
4.1 Water Resources Act 1991 (as amended by the Water Act 2003) 9
4.2 Environmental Permitting (England and Wales) Regulations 2010, as amended 9
4.2.1 Water Discharge Activity & Groundwater (Point Source) Activity 9
4.2.2 A Mining Waste Activity 10
4.2.3 An Industrial Emissions Activity 12
4.2.4 A Radioactive Substances Activity 14
5. Description of the Facility 15
5.1 Site Location 15
5.2 Site Description and Current Status 15
5.3 Waste Generating Activities 16
5.3.1 Drilling of Wressle-1 Sidetrack Well 16
5.3.2 Radial Drilling Operations 17
5.3.3 Near Wellbore Treatments 17
5.3.4 Proppant Squeeze 19
5.3.5 Hydrocarbon Production from Wressle-1 Well 22
5.3.6 Well Abandonment and Partial Well Abandonment 24
6. Extractive and Non-Extractive Waste Management 25
6.1 Operator Waste Objectives 25
6.2 Waste Prevention and Minimisation 25
6.2.1 Waste Prevention 25
6.2.2 Preparing for Re-Use 25
6.2.3 Recycle 25
6.2.4 Other Recovery 26
6.2.5 Dispose 26
6.3 Waste Description and Management Arrangements 26
6.3.1 Extractive Waste 26
6.3.2 Non-Extractive Waste 30

6.3.3 Waste Supervision and Carriers 31
6.3.4 Wellsite Supervisor 32
7. Environmental Risk Assessment 33
8. Measures to Minimise Environmental Impact 34
9. Control and Monitoring of Waste 34
9.1 Releases to Groundwater 34
9.1.1 Surface Release 34
9.1.2 Subsurface Release 35
9.1.3 Groundwater Quality Monitoring 35
9.2 Releases to Air 35
9.4 Wellsite Monitoring 36
9.5 Contractor Performance 36
9.6 Security 36
9.7 Complaints 37
10. Environmental Incident Management 37
10.1 Containment within the Wellbore 37
10.2 Wellsite Containment 37
10.3 Fire Response 38
10.4 Incident Reporting and Investigation 38
11. ALTERATIONS TO THE PLAN 39
12. PLAN FOR CLOSURE 40

1. INTRODUCTION

Egdon Resources U.K. Limited (Egdon Resources) is a subsidiary of Egdon Resources PLC, which was formed in 1997 and was awarded its first licence in 1998 and gained its first operated licence in 2000. Under the Petroleum Licensing system this permits the licence holder to '*search and bore for and get petroleum within the licence boundary'* subject to the granting of planning permission, in accordance with the Town and Country Planning Act 1990. Egdon Resources is an international petroleum exploration, development and production company with operations in the United Kingdom and France. The United Kingdom operations are conducted through Egdon Resources U.K. Limited and are directed from the registered office in Hampshire.

Egdon Resources is engaged in the exploration and production of petroleum onshore United Kingdom and holds 25% in the Petroleum Exploration and Development Licence 180 (PEDL 180) with the remaining interest held by Europa Oil and Gas (33.34%), Celtique (33.33%) and Union Jack Oil (8.33%). Within PEDL 180, Egdon Resources, as the operator, have successfully drilled and tested the Wressle-1 exploratory borehole.

Egdon Resources has previously obtained a permit (EPR/AB3609XX) from the Environment Agency to operate a mining waste operation at the Wressle wellsite, during the drilling and subsequent testing of the Wressle-1 well.

1.1 Site Details

The location of the Wressle wellsite, within which production of hydrocarbons from the Ashover Grit and other formations will be undertaken, is as follows:

Wressle Wellsite
Lodge Farm
Clapp Gate
Broughton and Appleby
DN15 0DB

National Grid Ref:	Easting: 496772 Northing: 411102
Site Area:	1.27 hectares.

The site surface boundary is detailed in green on the site plans included within ER-EPRA-W1-SP-004

2. SCOPE

This Non-Technical Summary is applicable to the Wressle wellsite and all hydrocarbon production operations and short duration well operations therein, in accordance with environmental permits and planning consent, both currently being sought in parallel by Egdon Resources.

It is applicable to Egdon Resources, its contractors and subcontractors and can be used in support of applications and variations to the Environment Agency under the Environmental Permitting (England and Wales) Regulations 2010, as amended (EPR 2010), where there is a requirement to provide a Non-Technical Summary and is specifically for an application or variation to operate a Mining Waste Operation, whether or not it includes a Mining Waste Facility.

3. DEFINITIONS

BAT:	Best Available Technique
Class 1 SPEL:	A separator designed to achieve a concentration of less than 5mg/l of oil within surface water discharges. Class 1 are approved by the Environment Agency.
EPR 2010:	Environmental Permitting (England and Wales) Regulations 2010
Hazardous Waste:	As defined by Article 3(2), 7 and Annex III of the Waste Framework Directive
HCl:	Hydrochloric Acid
HF:	Hydrofluoric Acid
Hot Oiling:	The circulating of hot oil (oil produced from the target formation) down the production tubing and back to surface, dissolving any wax build up within the tubing
HSE:	Health, Safety and Environment
Inert Waste:	A waste that does not undergo any significant physical, chemical or biological transformations. Does not give rise to environmental pollution or harmful to health
JAGDAG:	Joint Agencies Groundwater Directive Advisory Group
Kg:	Kilograms
m:	Metres
m^3:	Meters Cubed
mm:	Millimeters
MDRT:	Measured Depth below Rotary Table
Non Hazardous Waste:	A waste which is not classified as inert or hazardous waste
NORM:	Naturally Occurring Radioactive Material
Pollutant:	Any substance liable to cause pollution
Pollution:	A direct or indirect introduction, as a result of human activity, of substances or heat into the air, water land which may; a) Be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems b) Result in damage to material property c) Impair or interfere with amenities or other legitimate uses of the environment
Psi:	Pounds per square inch
Scf:	Standard Cubic Feet.

Scfd:	Standard Cubic Feet per day
Spent Acid (HCl):	Calcium chloride, carbon dioxide and water
TD:	Total Depth
TVD:	True Vertical Depth
W1:	Wressle-1 Well

4. ENVIRONMENTAL LEGISLATION AND APPLICABILITY

Activities associated with the exploration and production of oil and gas onshore in England fall to be considered within the scope of a number of pieces of legislation. A review of environmental legislation against the proposed hydrocarbon production from the Ashover Grit and other formations and short duration well operations, such as near wellbore treatments and proppant squeeze, has identified the following legislation as being applicable.

4.1 Water Resources Act 1991 (as amended by the Water Act 2003)

Under Section 199 of the Water Resources Act 1991 (as amended by the Water Act 2003), a notice of the intention to construct or extend a boring for the purpose of searching for or extracting minerals must be submitted to the Environment Agency using form WR11. The WR11 requires that a method statement, including drilling and casing design, together with storage and use of chemicals and drilling fluids, accompanies the WR11 application form. The Wressle-1 well was the subject of a WR11 application prior to the drilling of the wellbore in 2014. In addition, a second WR11 application will be made to the Environment Agency in due course as and when it is the intention of Egdon Resources to undertake a sidetrack drilling operation from the existing Wressel-1 well.

4.2 Environmental Permitting (England and Wales) Regulations 2010, as amended

A number of activities likely to be undertaken during the hydrocarbon production and short duration well operations, may require permitting under EPR 2010.

4.2.1 Water Discharge Activity & Groundwater (Point Source) Activity

Under Schedule 22 of EPR 2010, an activity that could involve the discharge of pollutants into groundwater must be notified to the Environment Agency, together with the nature of these pollutants. The Environment Agency will then determine whether the groundwater activity needs to be permitted.

During hydrocarbon production from the well, it may be necessary to undertake near wellbore treatments, including an acid squeeze and solvent treatment, all of which fall within the definition of a Groundwater Activity under Schedule 22 of EPR 2010.

Schedule 22 3 (3) of EPR 2010 provides that the *'The regulator may determine that a discharge, or an activity that might lead to a discharge, is not a groundwater activity if the input of the pollutant…*

(b) is or would be of a quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater.

To enable the regulator to deviate from the requirement for a groundwater activity permit, relating to an acid squeeze and solvent treatment, a description of the operations, together with a technical justification to exclude these operations under Schedule 22 paragraph 3 (3) of EPR 2010, is included within Section 5 of this Non-Technical Summary.

Also during hydrocarbon production from the well, it may be necessary to undertake a proppant squeeze, should it be deemed necessary to enhance production rates. This activity falls within the definition of a Groundwater Activity under Schedule 22 of EPR2010.

Schedule 22 3 (1) of EPR 2010 provides that '*Subject to sub-paragraphs (2) and (3) "groundwater activity" means any of the following:*

(c) any other discharge that might lead to the direct or indirect input of pollution to groundwater.

Although the risk to groundwater is very low, due to the way in which the Wressle-1 borehole has been constructed, Egdon Resources is taking a precautionary approach by determining the proposed proppant squeeze as requiring a groundwater activity permit.

Schedule 21 of EPR 2010 relates to water discharge activities. Although Egdon Resources proposes to install a Class 1 Oil-Water Separator, an application to discharge clean surface run-off water (often referred to as roof water) will not be required, as the surface water being discharged will be clean. An additional safeguard will be to restrict the discharge of surface water during short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, where temporary equipment onsite increases the potential for a minor spill to occur. During short duration well operations, surface run-off water will be contained onsite for subsequent offsite treatment and disposal at an Environment Agency permitting waste treatment facility.

Surface water collected within the permanent containment bund and permanent tanker loading area within the wellsite will be collected and stored temporarily onsite for subsequent offsite treatment and disposal at an Environment Agency permitting waste treatment facility.

4.2.2 A Mining Waste Activity

The Mining Waste Directive 2006/21/EC require that extractive wastes are managed in such a way that it minimises harm to human health and the impact on the environment. It applies to the management of waste resulting from the prospecting, extracting, treatment and storage of mineral resources and working quarries, which the Mining Waste Directive refers to as extractive waste. The waste can take the form of a solid, liquid or gas.

Schedule 20 of EPR 2010 defines a mining waste operation as being *the management of extractive waste, whether or not it involves a waste facility.* Under EPR 2010, an environmental permit is required to authorise a mining waste operation.

Hydrocarbon production from the well formation and short duration well operations will involve the management of non-hazardous extractive waste, should the following activities be undertaken at the Wressle wellsite:

- Drilling of sidetrack well;
- Radial drilling operations;
- Near wellbore treatment;
- Proppant squeeze; and
- Production of hydrocarbons.

It is anticipated that between 50% and 70% of the proppant carrier fluid used will be retained within the Ashover Grit formation. Article 3 (15) of the Mining Waste Directive defines a waste facility as *any area designated for the accumulation or deposit of extractive waste whether in a solid or liquid state or in solution or suspension, for the following time periods:*

- *No time-period for Category A waste facilities and waste characterised as hazardous in the waste management plan;*
- *A period of more than six months for facilities for hazardous waste generated unexpectedly;*
- *A period of more than one year for facilities for non-hazardous non-inert waste; and*
- *A period of more than three years for facilities for unpolluted soil, non-hazardous prospecting waste, waste, resulting from extraction, treatment and storage of peat and inert waste.*

Not all of the proppant carrier fluid will return to surface. Some will be retained within the Ashover Grit formation for a period exceeding one (1) year. In accordance with Article 3 (15) of the Mining Waste Directive, the Ashover Grit formation within which the proppant fluid is retained is designated a mining waste facility.

As the retained proppant fluid is classified non-hazardous, a Mining Waste Facility categorised M3 has been assigned, based on the Environment Agency permit variation forms (Category C).

Where a mining waste facility is to be considered, a review of the mining waste facility against criteria specified within Annex III of the Mining Waste Directive must be undertaken to determine whether or not the mining waste facility should be classified as a Category A Mining Waste Facility. The criteria for determining a Category A Mining Waste Facility is as follows:

a) A failure or incorrect operation e.g. the collapse of a heap or the busting of a dam, could give rise to a major accident, on the basis of a risk assessment taking into account factors such as the present or future size, the location and the environmental impact of the water facility;
b) It contains waste classified as hazardous under Directive 91/689/EEC above a certain threshold: or
c) It contains substances or preparations classified as dangerous under Directives 67/548/EEC or 1999/45/EC above a certain threshold.

An Environmental Risk Assessment has been undertaken to inform the permit application. The risk assessment did not identify any environmental risk associated with the retention of proppant fluid within the formation being squeezed as having the potential to give rise to a major accident.

The Wressle-1 well was constructed in 2014, in accordance with the Offshore Installation and Wells (Design and Construction, etc.) Regulations 1996. Casing was cemented through sensitive formations, isolating aquifers and groundwater zones. Casing shoes were set into non-porous strata to form a complete seal between well sections. This prevents the direct migration of fluids and gases from the wellbore to the shallow groundwater system during the production and well intervention phases of work.

The majority of the constituents within the proppant fluid are non-hazardous, having been assessed using the Joint Agencies Groundwater Directive Advisory Group (JAGDAG) assessment methodology. The assessment concluded that the majority of constituents assessed for use in the Wressle-1 proppant squeeze are classified as non-hazardous to groundwater. A copy of the JAGDAG substances assessment is provided within Appendix 3 of the Waste Management Plan (ER-EPRA-W1-WMP-005).

Three (3) constituents have been classified as hazardous, however, due to the extremely low quantity and concentration expected to be used within the Ashover Grit formation, the use of such constituents is considered de-minimis in accordance with Schedule 22 3 (3) of EPR 2010, as the quantity and concentration

so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater within the Ashover Grit formation.

It is anticipated that between 30% and 50% of the proppant fluid will return to surface following the proppant squeeze. The remaining 50% to 70% of the proppant fluid will be retained within the Ashover Grit formation, having been absorbed on the charged, high surface area clays within the formation.

In accordance with Annex III of the Mining Waste Directive, the formation within which the proppant fluid will be retained (Mining Waste Facility) is not considered Category A Mining Waste Facility.

Egdon Resources has previously obtained a permit from the Environment Agency to operate a mining waste operation at the Wressle wellsite. This Non-Technical Summary together with additional documents will be used in support of an application to vary the mining waste permit to include a mining waste facility.

4.2.3 An Industrial Emissions Activity

Industrial Emissions Directive 2010/75/EU lays down rules on integrated prevention of pollution arising from industrial activities, whilst also laying down rules designed to prevent or, where that is not practicable, to reduce the emissions to air, water and land and to prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole.

Schedule 1, Part 2 of EPR 2010 details a number of activities that are classified as an Industrial Emissions activity. These include, but not limited to:

- Chapter 1 - Energy Activities
    - Section 1.1 - Combustions Activities
    - Section 1.2 - Gasification, Liquefaction and Refining Activities
- Chapter 2 - Production and Processing of Metals
    - Section 2.1 - Ferrous Metals
    - Section 2.2 - Non-Ferrous Metals
- Chapter 3 - Mineral Industries
    - Section 3.1 - Production of Cement and Lime
    - Section 3.2 - Activities Involving Asbestos
- Chapter 4 - The Chemical Industry
    - Section 4.1 - Organic Chemicals
    - Section 4.2 - Inorganic Chemicals
- Chapter 5 - Waste Management
    - Section 5.1 - Incineration and Co-incineration of Waste
    - Section 5.2 - Disposal of Waste by Landfill
- Chapter 6 – Other Activities
    - Section 6.1 - Paper, Pulp and Board Manufacturing Activities
    - Section 6.2 - Carbon Activities

Regulation 35 of the Environmental Permitting (England and Wales) (Amended) Regulations 2013, which transposes the requirements of the Industrial Emissions Directive, requires an environmental permit to

authorise an installation operation for the incineration and co-incineration of waste specifically Section 5.1 which is described below.

Part A(1)

(a) The incineration of hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 10 tonnes per day;
(b) The incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour; and
(c) The incineration, other than incidentally in the course of burning landfill gas or solid or liquid waste, of any gaseous compound containing halogens.

Hydrocarbon production from the well at the Wressle wellsite will not include the incineration of natural gas exceeding 10 tonnes per day and, therefore, a permit to authorise an installation operation for the incineration of natural gas is not required.

Schedule 1, Part 2 of the EPR 2010 transposes the requirements of the industrial emissions directive, which requires an environmental permit to authorise an installation operation for gasification, liquefaction and refining activities, as detailed within Part A(1) of Schedule 1.2, as detailed below.

Part A(1)

(a) Refining gas where this is likely to involve the use of 1,000 or more tonnes of gas in any 12-month period.
(c) Operating coke ovens.
(d) Gasification or liquefaction of coal or other fuels in installations with a total rated thermal input of 20 megawatts or more.
(g) Refining mineral oils.
(h) The loading, unloading, handling or storage of, or the physical, chemical or thermal treatment of—
    (i) crude oil;
    (ii) stabilised crude petroleum;
(j) Activities involving the pyrolysis, carbonisation, distillation, liquefaction, gasification, partial oxidation or other heat treatment of—
    (i) coal (other than the drying of coal);
    (ii) lignite;
    (iii) oil;
    (iv) other carbonaceous material; or
    (v) mixtures of any of these,

Hydrocarbon production from the Ashover Grit formation will involve the loading, unloading, handling and storage of crude oil within the Wressle wellsite and, as such, an installation permit under Part 2 Schedule 1.2 of EPR 2010 is required. As the proposed activity is located within 50m of a watercourse, the activity falls outwith the conditions set within Standard Rules Permit SR 2015 No2.

4.2.4 A Radioactive Substances Activity

Schedule 23 of EPR 2010 provides for the control of Naturally Occurring Radioactive Material (NORM). Schedule 23 defines the production of oil and gas as a NORM industrial activity and therefore any accumulation of radioactive waste, which exceeds concentrations set out in Table 1 of Schedule 23 of EPR 2010 and its subsequent disposal requires an environmental permit to authorise a radioactive substances activity.

Hydrocarbon production from the Ashover Grit formation and short duration well operations will involve the circulating and/or flowing to surface of fluids exposed to the formation, as a result of near wellbore treatments, proppant squeeze and/or production. These fluids may or may not contain NORM in concentrations exceeding those set out in Table 1 of Schedule 23 of EPR 2010.

Egdon Resources has previously obtained a permit from the Environment Agency (EPR/HB3295DH/A001) for the storage and disposal of radioactive substances, during well testing operations. Whilst the activities proposed during hydrocarbon production from the Ashover Grit formation and short duration well operations may also generate waste classified as radioactive, the activity limits set within the existing radioactive substances permit are deemed to be sufficient.

5. DESCRIPTION OF THE FACILITY

5.1 Site Location

The Wressle wellsite is located within countryside in the county of North Lincolnshire. The wellsite is located approximately 350m east of Sadler's Lodge Farm and is bound to the north by Ella Beck with agricultural land beyond and to the west with a wood approximately 70m to the west. The village of Wressle is located 1.6km north of the wellsite.

The nearest residential property to the wellsite is North Cottage, located approximately 530m to the east. Decoy Cottage is located approximately 580m to the south of the wellsite.

A site location plan has been provided within ER-EPRA-W1-SP-004.

5.2 Site Description and Current Status

The Wressle wellsite is an existing temporary hydrocarbon exploration wellsite granted planning permission by North Lincolnshire Council on 18th June 2013 (Ref: MIN/2013/0281).

The wellsite was constructed in the spring of 2014 and is contained by a 2m high 138.5m by 80.5m security fence. Wellsite construction details are presented within the Wressle Site Condition Report (ER-EPRA-W1-SCR-006).

A mining waste permit (Ref: EPR/AB3609XX) was issued by the Environment Agency in 2014, in advance of the drilling operation.

Following drilling of the Wressle-1 well in 2014, an application to vary the existing mining waste permit and obtain a radioactive substances permit for the testing of the Wressle-1 well was submitted and subsequently approved by the Environment Agency on 6th October 2014.

Well testing operations were undertaken during 2015, which identified the Ashover Grit and other formations as a potential commercially producible hydrocarbon bearing formation. The well was subsequently suspended pending further evaluation and applications to the Minerals Planning Authority and Environment Agency for permission to produce hydrocarbons (oil and associated natural gas) from this formation.

Currently, the wellsite has only a small amount of equipment and facilities within it, including:

- A production tree (a system of valves to manage hydrocarbon flow and well entry) over the wellhead;
- Four storage tanks situated within a temporary bund;
- A site office/cabin; and
- Up to three storage containers.

Earth bunds partially screen the wellsite along the northern and western boundaries. There is a gate at the entrance to the site and parking provision for up to 12 vehicles.

The site boundary is detailed in green on site plans included within ER-EPRA-W1-SP-004.

5.3 Waste Generating Activities

A summary of the waste generating activities associated with hydrocarbon production from the Ashover Grit and other formations is detailed below. It should be noted that, with the exception of hydrocarbon production, the waste generating activities associated with short duration well operations, may or may not be undertaken one or more times throughout the life of the well, within the permitted scope of planning permission.

- Drilling of sidetrack well;
- Radial drilling operations;
- Near wellbore treatment operations of the Ashover Grit;
- Proppant squeeze of the Ashover Grit;
- Hot oiling (washing);
- Production operations; and
- Management of contaminated surface run-off water contained onsite.

Section 4.2.2 within this Non-Technical Summary, sets out the classification of waste streams associated with hydrocarbon production from the Ashover Grit formation and short duration well operations. Waste management arrangements for each waste stream are detailed within Section 5.3 of this Non-Technical Summary.

5.3.1 Drilling of Wressle-1 Sidetrack Well

A small sidetrack drilling operation may be undertaken to further enhance oil flow from the Ashover Grit formation. This will entail mobilisation of a drilling rig to the site to drill from the existing wellbore, just above the Ashover Grit at around 2,000mMDRT to beyond the base of the reservoir at around 2,025mMDRT. The objective of the sidetrack would be to intersect the hydrocarbon bearing formation that may have formation damage present, and would be a short drilled length out of the existing casing of approximately 25m in length by a 3 ¾" diameter, extending out of the existing 4 ½" steel liner.

A conventional oilfield drilling rig will be mobilised to the wellsite, rigged up and commissioned. A whipstock will then be run and set in the well, immediately below the point of sidetrack at circa 2,000mMDRT. A milling assembly will then mill a hole in the existing casing providing access to the formation. A 3 ¾" (95mm) drilling assembly will then be run and will drill from circa 2,000mMDRT to 2,025mMDRT, the base of the hydrocarbon bearing formation, using an oil based drilling fluid system.

Once the sidetrack has been drilled, a 2 $^{7}/_{8}$" (73mm) liner or tailpipe will be run and secured into position.

The sidetrack drilling operation, including mobilisation and demobilisation from the wellsite is anticipated to take up to four weeks to complete.

5.3.2 Radial Drilling Operations

Egdon Resources may also undertake the drilling of two or more drain holes into the Ashover Grit formation using a technique known as radial drilling. The drain holes would be achieved by drilling out of the existing casing using high-velocity fluid jets through a rotating nozzle, creating small boreholes of up to 2" (51mm) diameter, each up to 100m in length within the hydrocarbon bearing formation. The drilling fluids used to radial drill the formation will be oil based, similar to those used to drill the sidetrack well.

The depth from which the radially jetted drain holes could be drilled from the existing borehole is approximately 2010mMDRT. The objective of the drain holes is to improve oil production efficiency by extended the reach and contact beyond the borehole. It involves the mobilisation of a small coiled tubing unit to site, a workover rig, a crane and ancillary equipment.

The indicative layout of the equipment for this operation is defined within ER-EPRA-W1-SP-004.

5.3.3 Near Wellbore Treatments

Egdon Resources may also undertake one or more near wellbore treatments within the Ashover Grit formation during the lifetime of hydrocarbon production from the well, the details of which are described below. The purpose of near wellbore treatments is to reinstate or improve the permeability of the formation, having potentially been blocked as a result of the initial drilling and completion operations.

All near wellbore treatments will be applied to the Ashover Grit and other formations at pressures and pump rates lower than those that would be required for fracture propagation into the formation. Initially, an injectivity test is first undertaken. This test is an engineering test, which will apply increased pressure to the formation until it reaches a point at which injectivity starts to occur. This, in turn, will determine the maximum pressure that can for a near-wellbore treatment. The applied pressure is controlled by the injection rate (I.e. the pump rate) which is typically very low, in the order of 1 barrel (159 litres) per minute.

The fluid used to undertake the injectivity test will typically be hydrochloric acid (HCl), at 10-15% concentration with water (i.e. 150kg of HCl with 850kg of water).

5.3.3.1 Acid Squeeze

To improve the flow of hydrocarbons within the Ashover Grit formation, an acid, most commonly hydrochloric acid (HCl) at 10-15% concentration with water (i.e. 150kg of HCl with 850kg of water) plus hydrofluoric acid generating formulation, may be applied to the formation through the existing perforations within the wellbore. The operation is very much akin to those used in the rehabilitation of public water supply and commercial water wells constructed within carbonate formations within the UK.

An acid squeeze is applying the acid to the formation at pressures and rates determined by the injectivity test, resulting in the acid being squeezed into the near wellbore formation matrix and increasing the near wellbore permeability.

This would involve small volumes circa 50m^3 of a dilute hydrochloric acid (HCl) and hydrofluoric acid (HF) generating formulation being injected, left to "soak" for a few hours and then flowed back through the production equipment for collection and subsequent disposal.

A preflush of 10m^3 10-15% HCl containing surface-tension reducing additives and corrosion inhibitor is pumped into the formation. This is then immediately followed by the main treatment of 20m^3 ammonium

biflouride, again with corrosion inhibitor, and is pushed into the formation past the damage zone using up to 20m^3 3-5% ammonium chloride solution containing typically 10% ethylene glycol monobutyle ether (EGMBE) and polyquarternary amine clay stabilizer.

The treatment may then be further displaced with a low toxicity based oil, which may replace some or all of the ammonium chloride.

The entire treatment is typically energised with nitrogen and following full displacement into the formation is then flowed back in a controlled manner, through standard production related equipment for collection and disposal.

The acid reacts with minerals within the formation, the chemical reaction produces a neutral solution if fully reacted i.e. neither alkali or acidic, though in practise the flow back fluid usually remains slightly acidic. The solution produced as part of the reaction with the formation will be flowed back and removed from the Wressle-1 well.

Deeper aquifers within the Jurassic, Triassic and Permian are not considered to be important receptors due to their depth and likely high salinity or mineralised groundwater quality.

Whilst the injection of acid and the displacement of acid using a low toxicity based oil is a 'groundwater activity', the quantity and concentration used within the deep saline water bearing formation is such that the activity is considered de minimis and can be excluded under Schedule 22 3 (3) of EPR 2010. The acid squeeze within the Ashover Grit does not, therefore, require a groundwater permit.

5.3.3.2 Hot Oil Wash

Crude oil generally contains dissolved waxes that can precipitate within the natural fractures of the formation, restricting the flow of hydrocarbons to the well. Paraffin is one such wax, primarily consisting of long chain, saturated hydrocarbons.

Hot oil washing is a process of removing the build-up of paraffin precipitates within the production tubing. Hot oil, previously produced from the formation, is pumped from storage tanks onsite, via a mobile hot oil pump, which heats the oil prior to circulating down the well. Hot oil is pumped down the tubing to immediately above the perforations and circulated back to surface, dissolving or dislodging paraffin precipitates. Paraffin precipitates dissolved or dislodged within the hot oil are diverted from the well at surface back to the onsite oil storage tanks where it is comingled with the produced oil. Produced oil is subsequently transferred to road tankers and removed from site by a licenced haulier to a permitted refinery for sale.

For clarity, no hot oil is pumped into the formation and no waste is generated, therefore, a groundwater activity permit is not required nor does the activity fall to be considered a mining waste activity.

5.3.3.3 Solvent Treatment

Similar to hot oiling, solvents treatment is a process of removing the build-up of paraffin precipitates within the near wellbore formation and production tubing. It is pumped down the well and squeezed into the formation. The solvent dissolves the paraffin precipitates, re-establishing the flow of hydrocarbons.

The spent treatment and the dissolved paraffin precipitates return to surface and diverted from the well at surface back to the onsite oil storage tanks where it is comingled with the produced oil. Produced oil is

subsequently transferred to road tankers and removed from site by a licenced haulier to a permitted refinery for sale.

For clarity, no solvent treatment is retained in the near wellbore formation.

Whilst the injection of solvent treatment is a 'groundwater activity', the quantity and concentration used within the deep saline water bearing formation and the recovery of all treatment fluids is such that the activity is considered de minimis and can be excluded under Schedule 22 3 (3) of EPR 2010. The use of solvent treatment within the Ashover Grit does not, therefore, require a groundwater permit.

5.3.3.4 Nitrogen

To aid the initial flow of hydrocarbons from the formation, nitrogen may be injected into the wellbore to displace wellbore fluids, reducing its hydrostatic weight. Nitrogen is classified as an inert waste and venting of such considered a closed loop system, insofar as nitrogen is extracted from the atmosphere and is vented back to atmosphere. No nitrogen would remain in the formation.

A summary of the near well bore treatments that may be required throughout the life of the well is summaries in Table 5.1 below.

Near Wellbore Treatment Table			
Treatment	**Description**	**Chemicals used**	**Waste**
Acid Squeeze	Acid is applied to the formation to aid the flow of hydrocarbons to the surface cleaning out the near wellbore formation removing debris and induced damage resulting from the initial drilling operation. An acid squeeze involves injecting the treatment and low pump rates and controlled pressure to treat the area in the vicinity of the casing perforations.	Hydrochloric Acid and Hydrofluoric Acid solution.	Spent acid is circulated out of the well. See Section 5.3
Hot Washing	Hot oil and/or hot water is applied to the formation with the aim to remove solid hydrocarbons such as paraffin's from the near wellbore formation.	Hot oil and/or hot water	See Section 5.3
Solvent Treatment	Solvent is applied to the formation in oil bearing formations to remove solid hydrocarbons near the wellbore. Solvents only dissolve with hydrocarbons and do not react with the formation.	Hydrocarbon based solvents	See Section 5.3
Nitrogen Lift	To aid the initial flow of hydrocarbon, nitrogen may be injected into the wellbore to displace wellbore fluids, reducing its hydrostatic weight. Nitrogen is classified as an inert waste and venting of such considered a closed loop system, insofar as nitrogen is extracted from the atmosphere and is vented back atmosphere.	Nitrogen	Nitrogen will flow to surface. See Section 5.3

Table 5.1: Near Wellbore Treatment Table

5.3.4 Proppant Squeeze

In order to increase the permeability within the Ashover Grit formation, it may be necessary to undertake a proppant squeeze, which is designed to create channels of communication through near wellbore formation, having potentially been blocked as a result of the initial drilling and completion operation.

A proppant squeeze involves a slurry of proppant (resin-coated ceramic) and gelled water being pumped through the perforations into the Ashover Grit formation at a pressure exceeding the fracture propagation pressure of the formation. Injecting pressure and pump rates high enough to propagate a fracture in the formation creates channels of communication through near wellbore formation damage. When the pressure

is released the proppant remains in situ propping open the small fractures, through which hydrocarbons can flow at enhanced rates. Unlike hydraulic fracturing, a proppant squeeze requires the use of only a small volume of proppant and carrier fluid as it seeks to only bypass the formation damage rather than specifically to enhance the natural permeability of the formation.

A pre-treatment injectivity test will first be undertaken using approximately $15m^3$ – $25m^3$ of gelled liquid. The purpose of the injectivity test is to determine the breakdown pressure, propagation pressure and carrier fluid leak-off rate, which in turn will inform the main proppant treatment.

The main proppant treatment will consist of approximately 20 to 30 tonnes of resin-coated ceramic beads and approximately $80m^3$ to $120m^3$ of gelled liquid. The fluid mix is injected at a surface pressure of 9,000psi for 1 to 2 hours, then flowed back through the production facilities in a controlled manner.

The proppant squeeze is designed to extend circa 40m in a lateral direction and 20m in a vertical direction, above and below the perforation.

This is a small scale operation which historically has taken place in Lincolnshire (e.g. nearby Crosby Warren well), where there are tight formations of sandstone reservoirs, or where there are formation damage issues preventing the full flow potential.

A full disclosure of the proposed proppant fluid, including a breakdown of each component is provided as Appendix 4 within the Waste Management Plan (ER-EPRA-W1-WMP-005).

5.3.4.1 Flowback Water and Disposal

A percentage of the proppant fluid will be returned to surface (flowback water) via the production facilities and stored onsite for subsequent offsite transfer to an Environment Agency approved waste treatment facility for disposal in accordance with the receiving waste treatment facility's environmental permits. The percentage returned is expected to be circa 30% with a maximum of 50%, based upon previous proppant squeeze operations undertaken by the industry.

Flowback water has the potential to contain low levels of Naturally Occurring Radioactive Material (NORM), which predominantly relate to the isotopes of radium (and associated progeny), which find their way into the water due to their chemical solubility. Elevated concentrations of radium-226 and radium-228 progeny may also be present due to dissolved Rn-222 (radon) and to a lesser extent, Rn-220 (thoron) gas. Samples of flowback water shall be sent to a laboratory holding the appropriate accreditations for radionuclide analysis.

A radioactive substances permit has previously been issued for the Wressle wellsite, covering the handling and storage NORM contained within formation water. Whilst the activities proposed during hydrocarbon production from the Ashover Grit formation will also generate radioactive waste, the activity limits set within the existing radioactive substances permit are deemed suitable.

5.3.4.2 Retained Fluid within the Formation

The remaining 50% to 70% of proppant fluid will be retained within the formation, having been adsorbed on the charged, high surface area minerals within the formation. The majority of the constituents within the proppant fluid are non-hazardous, having been assessed using the Joint Agencies Groundwater Directive Advisory Group (JAGDAG) assessment methodology. The assessment concluded that the majority of constituents assessed for use in the Wressle-1 proppant squeeze are classified as non-hazardous to

groundwater. A copy of the JAGDAG substances assessment is provided within Appendix 3 of the Waste Management Plan (ER-EPRA-W1-WMP-005).

Three (3) constituents have been classified as hazardous, however, due to the extremely low quantity and concentration expected to be used within the Ashover Grit formation, the use of such constituents is considered de-minimis in accordance with Schedule 22 3 (3) of EPR 2010, as the quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater.

The formation within which the fluid is retained is expected to be classified by the Environment Agency as a Non-Hazardous Mining Waste Facility, the extent of which will be determined through fracture height and growth modelling.

An indication of the aerial extent of the Non-Hazardous Mining Waste Facility for the proppant fluid is included within document ER-EPRA-W1-SP-004 and is based on the maximum anticipated fracture length. The base of the well is approximately 1,140m southwest of the surface location, which for clarity, is the top of the borehole within the Wressle wellsite.

As a result of the retention of proppant fluid with the Ashover Grit formation being classified as a Mining Waste Facility, there is a requirement, through assessment, to establish BAT for the management of the retained proppant fluid. The options considered as part of the BAT assessment include:

- Recovery of all proppant carrier fluid over prolonged flowback periods during hydrocarbon production;
- Increased recovery of proppant fluid using artificial lifting (submersible pumps);
- Recovery of proppant fluid by excavation; and
- Retention of proppant fluid within the formation.

The BAT assessment identified that both the prolonged flowback periods and artificial lift are unlikely to result in a 100% recovery of proppant fluid from the formation.

Recovery by excavation is not feasible due to the depth of formation within which the fluid is retained. Such methods of excavation would have a significant environmental impact. This would involve the development of a mineshaft considerably wider than the original Wressle-1 borehole to a depth of circa 1,576mTVD, sufficiently large enough to accommodate structural supports for safety against collapse and of entry of necessary personnel, machinery and supplies.

The development of a mine would create significant extractive waste, the volume of which would far exceed the volume of waste the development seeks to retrieve from the target formation. This option offers no environmental benefit and would cause significant local amenity impacts and disruption to the local community. Economically, the development of a mine would render the exploration and subsequent production of hydrocarbons from the Ashover Grit formation unviable.

As it is not feasible to retrieve 100% flowback, either by a prolonged flowback period or by artificial lift and the removal of proppant fluid by excavation is not feasible, retention within the formation is considered BAT. The alternative options are unrealistic and/or theoretical in nature. Injected proppant fluid, retained at depth, does not present a credible environmental risk.

Proppant retained within the formation prevents the fractures from closing and provides the permeability for hydrocarbons to flow. As the proppant fulfils a purpose, it is not considered a waste.

5.3.5 Hydrocarbon Production from Wressle-1 Well

Drilling of the Wressle-1 borehole was completed during third quarter 2014 followed by successful well testing operations during 2015. The Waste Management Plan (ER-EPRA-W1-WMP-005) has been produced to consider the management of extracted waste from hydrocarbon production from the Ashover Grits formation and, near wellbore treatments and proppant squeeze, as may be required.

Hydrocarbon production has the potential to generate extractive waste in the form of formation water, spent wellbore treatment fluids and/or flowback water. Depending on the characteristics of the Wressle-1 well, a mixture of oil and natural gas will be produced with the associated extractive wastes. Depending on the volumes of natural gas encountered, should the volume be insufficient for power generation, it will be considered extractive waste and disposed of safely by way of an enclosed ground flare.

5.3.5.1 Oil Production

Produced fluids (oil, formation water, spent wellbore treatment fluids and/or flowback water) will either free flow to the surface naturally or with the aid of surface pump, artificially lifting fluids to surface. For clarity, a permit subject to the Mining Waste Directive covers the management of extracted waste and not the extraction process, therefore, the method by which oil, natural gas and associated fluids come to surface is not a material consideration of the Waste Management Plan (ER-EPRA-W1-WMP-005) and associated environmental permits.

At surface, produced fluids and associated natural gas will be diverted by pipework to a bath heater (if water is present), preheating the fluid to aid in the three phase separation process, which will separate out oil, water (if present) and associated natural gas. Oil, which for clarity is not a waste, will be diverted via pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to a permitted refinery for sale.

Water, if present, will be diverted via pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to either Environment Agency permitted water reinjection facility for reinjection or an Environment Agency permitted water treatment facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility.

If natural gas is produced along with the oil, then gas will be managed in accordance with Section 5.3.5.2.

Water produced during hydrocarbon production has the potential to contain low levels of Naturally Occurring Radioactive Material (NORM). Samples of formation water will be sent to a laboratory holding the appropriate accreditations for radionuclide analysis by gamma spectrum. Depending on the outcome of radionuclides analysis, formation water will be transported via a licenced haulier to either an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility, or to a bespoke RSR permitted waste treatment facility for treatment and disposal in accordance with Best Available Technique (BAT). Egdon Resources is also considering alternate facilities, such as reinjection wells for the purpose of disposing water containing NORM.

The disposal of formation water contaminated with NORM is subject to the correct environmental permits being in place by the receiving operator, whom the Environment Agency will regulate.

5.3.5.2 Associated Natural Gas

The primary objective of the Wressle-1 well is to produce oil from the Ashover Grit formation, however, previous well testing operations indicate that natural gas may be present.

Regardless of the quantity of natural gas present with the oil, an enclosed ground flare will be installed onsite as the method of safely disposing of natural gas, in the case of routine maintenance or an emergency, where the requirement to blowdown the gas within the surface production equipment exists, once the well is shut in.

During the initial stages of hydrocarbon production, natural gas will be disposed of safely via the enclosed ground flare located onsite. This will also aid in the establishment of flow rates and pressures, which in turn will inform the decision as to whether the natural gas is sufficient in quantity and flow rate to sustain electricity generation by way of a gas engine to power the site, with any remaining electricity being exported to the national grid, up to the capacity limit of the receiving electricity distribution system.

At this early stage in the development of the Wressle wellsite, it is difficult to predict the volumes, flow rates and longevity of associated natural gas production from the Wressle-1 well. Likewise, the cost and timescales associated with the installation of electricity generating equipment and connection to the national grid contribute to whether the use of associated natural gas, in accordance with Article 5 (2) of the Mining Waste Directive, is commercially viable.

The criteria for determining the management of associated natural gas production from the Wressle-1 well is detailed below.

Low Gas Volumes

Generally, the lower threshold limit for the combustion of natural gas via an enclosed ground flare is approximately 18,000scfd, which equates to approximately 750scf per hour. If the production of natural gas is below this threshold limit, it may not be feasible to combust the natural gas without the introduction of support gas, such as propane.

Notwithstanding the lower threshold limit, natural gas production above 18,000scfd but below 50,000scfd is not likely to be sufficient to enable generation of electricity and export to the national grid. It may be possible, however, to generate small quantities of electricity via a gas engine and use locally by either heat or feed into the site distribution system, or “dump” the electrically generated load via a load bank.

If none of these options are technically or commercially feasible, the proposal would be to safely dispose of the natural gas via an enclosed flare, assuming the volumes are sufficient to maintain combustion.

Medium to high gas volumes

If volumes are sufficient and it is deemed commercially viable, natural gas will be used to generate electricity and export to the national grid.

It should be noted that a ground flare will still be required onsite if medium to high gas volumes are sustainable to either combust any residual gas that cannot be used (i.e. flow rates exceeds the maximum capacity of the gas engine and/or to act as a relief flare in the event of equipment or operational failure/malfunction).

If gas volumes are such that electricity generation is above the capacity of the export connection, it may be that a load bank is used to harness the additional natural gas rather than sending excess gas to the flare system.

5.3.6 Well Abandonment and Partial Well Abandonment

Upon cessation of hydrocarbon production, the well will be abandoned in accordance with Oil & Gas UK *Guidelines for the suspension and abandonment of wells*, which requires all distinct permeable zones penetrated by the well to be isolated from each other and from surface by a minimum of one permanent barrier. If any permeable zone penetrated by the well is hydrocarbon-bearing or over-pressured and water-bearing then the requirement is for two permanent barriers from surface, the second barrier being a back-up to the first.

In addition to the Oil & Gas UK *Guidelines for the suspension and abandonment of wells*, the well abandonment(s) will be undertaken in accordance with the following regulations:

- The Borehole Sites and Operations Regulations 1995, and
- Offshore Installations and Wells (Design & Construction, etc) Regulations 1996

The initial design and construction of the well takes into consideration the permeable zones encountered during the drilling operation and whether any of these zones are hydrocarbon-bearing or over-pressured and water-bearing. Construction of the borehole has provided adequate sealing of these zones when cementing in the various steel casing strings, ensuring compliance with the Oil & Gas UK guidance.

Based on a borehole construction, which complies with Oil & Gas UK guidance for the suspension and abandonment of wells, the internal section of last cemented casing string will be subject to well abandonment. The operation involves the setting of cement barriers, extended above and below the permeable zone(s). Retainers are positioned within the internal casing string immediately below the required cement depth, which prevents the cement from moving or slumping during setting.

Once the well is abandoned, the casing strings will be mechanically cut off at 1.5m below original ground level and a steel plate welded over the top. The pre-cast concrete drilling cellar would then be removed and the site restored to its former use.

6. EXTRACTIVE AND NON-EXTRACTIVE WASTE MANAGEMENT

The following sections describe the various extractive and non-extractive wastes arising from hydrocarbon production, near wellbore treatments and proppant squeeze operations, their classification and anticipated quantities. This section also describes the objectives of Egdon Resources of appropriately managing wastes and how these objectives are achieved through waste minimisation, methods of treatment and disposal.

6.1 Operator Waste Objectives

Egdon Resources policy on waste Duty of Care, waste segregation, waste handling and waste transfer are set out within the Management System Summary HSE-MWP-WSL-012.

The Site Waste Manager for the Wressle wellsite is the Egdon Resources Wellsite Supervisor during periods of activity onsite, who reports to the Egdon Resources Production and HSE Manager. During periods of non-activity and where production activities are solely taking place onsite, the Egdon Resources Production and HSE Manager shall take the role of the Site Waste Manager, who will:

- Promote awareness of the Waste Management Plan (ER-EPRA-W1-WMP-005);
- Monitor and report on waste generation;
- Monitor and enforce on waste segregation;
- Monitor the effectiveness of the Waste Management Plan (ER-EPRA-W1-WMP-005);
- Form a good working relationship with the waste management contractor; and
- Encourage suggestions for better waste management onsite.

6.2 Waste Prevention and Minimisation

Egdon Resources and its specialist contractors follow Article 4 of the revised EU Waste Framework Directive which is transposed within UK law through the Waste (England and Wales) Regulations 2011.

6.2.1 Waste Prevention

Every effort will be made to eliminate the waste produced at source. Control measures will include:

- Avoiding packaged material where practicable;
- Ordering correct quantities;
- Avoiding damage by handling and storing correctly; and
- Using fewer materials in designs and manufacturing.

6.2.2 Preparing for Re-Use

Only dispose of waste which cannot economically or practically be re-used or recycled. Materials such as low toxicity oil based drilling fluids can be readily re-used. Checking, cleaning, repairing and refurbishing of items and spare parts for subsequent re-use.

6.2.3 Recycle

Waste is to be segregated onsite to allow for recycling offsite. Additionally, materials that are recycled shall be procured for use onsite where practicable and where specification permits. Turning wastes into a substance or product including composting subject to quality protocols.

6.2.4 Other Recovery

Other recovery includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste, some backfilling.

6.2.5 Dispose

Waste that cannot be reused or recycled practicably shall be disposed of responsibly and in compliance with Egdon Resource's duty of care obligations. All waste shall be removed from site by a licenced waste carrier to a licenced waste facility.

6.3 Waste Description and Management Arrangements

An assessment of the potential waste arising from hydrocarbon production, near wellbore treatments and proppant squeeze has been undertaken. The potential waste, together with its classification anticipated quantities, prevention, minimisation, treatment and disposal is provided in this section.

For clarity, a hot oil wash, as described in Section 5.3.3.2 does not generate waste and, therefore, is not included below. Likewise, solvent treatments comingle with the produced hydrocarbons, which are stored onsite for subsequent offsite removal by a licenced haulier to a permitted refinery for sale. No treatment fluid is retained in the formation and therefore not included below, as no waste is generated.

6.3.1 Extractive Waste

6.3.1.1 Well Suspension Brine

The Wressle-1 well is the subject of a period of suspension using suspension brine and mechanical plugs. Following suspension, any further operations will require the suspension brine to be circulated out of the well to an onsite storage tank via surface pipework. The suspension brine will be stored onsite for subsequent reuse if required for the Wressle-1 well at a later date if the well will need to be suspended again. Once the suspension fluid has fully served its purpose at the wellsite, the suspension brine will be removed from site via a licenced haulier to an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility.

Classification:	Non Hazardous
EWC Code:	01 05 08
Estimated Quantity:	25m3
Onsite Storage:	1 x 60m3 Horizontal Cylindrical Closed Tank
Storage Duration:	Maximum 7 Days
Odour Potential:	No Odour Anticipated

6.3.1.2 Sidetrack & Radial Drilling Operation: Oil Based Rock Cuttings

Drilling fluids are used in a closed loop system, within which the rock cuttings are circulated to surface and removed by vibrating screens (shakers) into an open top tank, which is also a fluid separator tank. Finer particles of rock cuttings are then extracted from the drilling mud by a centrifuge and the drilling mud is circulated back down the well. The ability to prevent or minimise rock cuttings recover is limited given that the formation needs to be removed to allow the casing to be installed. The selection of the drilling bit will be such that it minimises the hole size required to install each string of casing which, in turn, keeps the recovered volumes to a minimum. The rock cuttings tank is a fluid separator tank (perforated false floor), which allows drilling mud that coats the rock cuttings to percolate down through the false floor where it is collected and

pumped back into the closed loop mud system. Rock cuttings will be transferred from the rock cuttings tank to a sealed road bulker by a hydraulic grab arm fitted to the rock cuttings tank and transported offsite via licenced haulier to a permitted composting facility where it is blended into compost after compost has been sanitised.

Classification:	Hazardous
EWC Code:	01 05 05
Estimated Quantity:	Sidetrack = 0.4m3 Radial = 0.20m3 per radial drill
Onsite Storage:	1 x 31m3 Open Top Fluid Separator Tank (Drill Cuttings) and 1 x 20m3 Open Top Tank (Centrifuge)
Storage Duration:	Maximum 7 Days
Odour Potential:	No Odour Anticipated

6.3.1.3 Sidetrack & Radial Drilling Operation: Oil Based Drilling Fluid

Drilling fluids are used to aid in the drilling process by lubricating the drill bit, circulating to surface the rock cuttings from the drilling process and for well control by maintaining a prescribed hydrostatic pressure within the well to prevent the uncontrolled release of natural gas or formation pressure. Drilling fluids are used in a closed loop system, within which the rock cuttings are circulated to surface and removed by vibrating screens (shakers). Finer particles of rock cuttings are then extracted from the drilling mud by a centrifuge and the drilling mud is circulated back down the well. Drilling fluid waste is minimised by continually reusing the mud in a closed loop system and sustained by way of filtering out rock cuttings and finer particles of rock. The rock cuttings tank is a fluid separator tank (perforated false floor), which allows drilling fluid that coats the rock cuttings to percolate down through the false floor where it is collected and pumped back into the closed loop mud system. Whenever the low toxicity oil based drilling mud weight exceeds the prescribed mud weight, due to finer particles of rock cuttings in the mud, the drilling mud needs to be centrifuged, which is performed onsite. Drilling fluids are used in a closed loop system onsite. Low toxicity oil based drilling fluids do not become a waste when no longer required for use in the operation, as they are returned to the supplier for reuse. A small volume of low toxicity oil based mud, contaminated with clean up fluid results from rig tank and equipment cleaning, which is transferred to a vacuum tanker for removal offsite via licenced haulier to a permitted disposal facility.

Classification:	Hazardous
EWC Code:	01 05 05
Estimated Quantity:	Sidetrack = 5m3 Radial = 1m3 per radial drill
Onsite Storage:	1 x 60m3 Horizontal Cylindrical Closed Tank
Storage Duration:	Maximum 7 Days
Odour Potential:	No Odour Anticipated

6.3.1.4 Cement (Plugging and Abandonment Cementation)

On completion of hydrocarbon production from the well, it is plugged and abandoned as per Section 5.3.6. Careful planning will be taken prior to any cement operation being undertaking allowing Egdon Resources to calculate the amount of cement required thus preventing or minimising cement waste. The cement will be batched mixed to allow control of quantities being used, which further prevents and/or minimises cement waste. The cement operation will be undertaken by a competent contractor to reduce the amount of potential

wastes produced from the returns to surface. The amount of waste cement expected is to be minimal. Excess returns to surface will be transferred to a number of open top builders skips onsite for subsequent removal and disposal to an environmental agency permitted waste facility where it recycled as building rubble for use within the building industry.

Classification:	Non Hazardous
EWC Code:	17 01 01
Estimated Quantity:	5m3
Onsite Storage:	6m3 Open Top Builder's Skip
Storage Duration:	Maximum 7 Days
Odour Potential:	No Odour Anticipated

6.3.1.5 Near Wellbore Treatment – Spent Acid

Acid is used to remove production-resisting completion-induced formation matrix damage. As the acid reacts with minerals within the formation the chemical reaction produces a near neutral solution, generally mildly acidic. The solution produced as part of the reaction with the minerals will be lifted out of the wellbore into a closed tank and stored onsite for subsequent removal via a licenced haulier to an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility. The acid will be used in stages to ensure its use is minimised. The reaction of the acid with minerals produces. This reaction, and in turn the waste generated, is unavoidable. Careful planning will be taken prior to any acid squeeze being undertaking to ensure Egdon Resources minimises the amount of acid used, which in turn reduces the amount of waste generated by the operation. The spent acid will be lifted out of the wellbore into a closed tank and stored onsite for subsequent removal via a licenced haulier to an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility.

Classification:	Non Hazardous
EWC Code:	16 10 02
Estimated Quantity:	50m3
Onsite Storage:	1 x 60m3 Closed Tank
Storage Duration:	Maximum 7 Days
Odour Potential:	No Odour Anticipated

6.3.1.6 Nitrogen

Nitrogen is injected into the well to aid the initial lifting of wellbore fluids, thus reducing the hydrostatic pressure and allowing hydrocarbons to flow to surface. The use of nitrogen can be classified as a closed loop system, having first been extracted from the atmosphere during its manufacturing process and subsequently released to atmosphere. The quantities of nitrogen required are small and a detailed measurement cannot be provided at this stage. As an inert gas, nitrogen that has been extracted from the atmosphere will be comingled with any natural gas that flows to surface, where it will be combusted. Unburnt nitrogen will be released to atmosphere during the natural gas combustion process.

Classification: Inert
EWC Code: Not Applicable
Estimated Quantity: Not Known at this Time
Onsite Storage: None – Comingled with the Natural Gas
Storage Duration: Not Applicable
Odour Potential: No Odour Anticipated

6.3.1.7 Proppant Carrier Fluid (Retained in Formation)

Egdon Resources would like to retain the option to undertake a proppant squeeze if required. The technique is used to undertake low volume hydraulic fracturing of the formation and prop open the fractures using proppant. This in turn provides permeability, allowing natural gas and oil from within the formation to flow up into the wellbore and up to surface. Due to the nature of the Ashover Grit formation, it is anticipated that up 50% of proppant fluid will return to surface. The remaining fluid will be retained within the Ashover Grit formation and, as such, is classified as a Non-Hazardous Mining Waste Facility. No less than 50% of the proppant fluid will be retained within the Ashover Grit formation.

Classification: Non Hazardous
EWC Code: 16 10 02
Estimated Quantity: 180m3
Onsite Storage: Not Applicable
Storage Duration: Indefinitely
Odour Potential: Not Applicable

6.3.1.8 Proppant Carrier Fluid (Flowback Water)

Egdon Resources would like to retain the option to undertake a proppant squeeze if required. The technique is used to undertake low volume hydraulic fracturing of the formation and prop open the fractures using proppant. This in turn provides permeability, allowing natural gas and oil from within the formation to flow up into the wellbore and up to surface. Due to the nature of the Ashover Grit formation, it is anticipated that up 50% of proppant fluid will return to surface. Depending on the outcome of radionuclides analysis, flowback water will be transported via a licenced haulier to either an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility, or to a bespoke RSR permitted waste treatment facility for treatment and disposal in accordance with the Best Available Technique (BAT).

Classification: Non Hazardous
EWC Code: 16 10 02
Estimated Quantity: 180m3
Onsite Storage: 1 x Silo
Storage Duration: Maximum 28 Days
Odour Potential: No Odour Anticipated

6.3.1.9 Proppant

Flowback water will contain proppant (resin-coated ceramic) which is removed at surface. The quantity of proppant used is determined by the required composition of the proppant fluid. Proppant retained within the formation is not classified as a waste as it serves the purpose of 'propping' fractures within the formation. The proppant will be transported offsite via licenced haulier to an Environment Agency permitted composting facility, where it is blended into compost after compost has been sanitised.

Classification:	Non Hazardous
EWC Code:	01 04 09
Estimated Quantity:	30 Tonnes
Onsite Storage:	15 x 70m3 Horizontal Closed Tank
Storage Duration:	Maximum 28 Days
Odour Potential:	No Odour Anticipated

6.3.1.10 Natural Gas

During production operations there is a likelihood of natural gas being produced from the formation and flowed at different rates to determine the characteristics of the formation, allowing Egdon Resources to determine whether or not the reservoir is capable of producing commercial quantities of natural gas. The ability to prevent or minimise natural gas is extremely limited during this operation as it is required to allow Egdon Resources to determine the condition and state of the reservoir. Given that the operation involves production, consideration has been given to the longer term, where there are a number of options in terms of management of associated or produced gas, which depend on the volumes of gas, the cost and timescale options if volumes are significant, and longevity (i.e. for how long gas would last). Natural gas is separated from produced fluids at surface and diverted via pipework to a ground flare located onsite for incineration. The ground flare will be fitted with a pilot and an electrical ignition system. The flare will also be continuously propane fed to allow for a continuous flame. If natural gas is produced at commercially viable quantities incineration of natural gas will only occur as a safety precaution or if residual gas is present which cannot be used.

Classification:	Hazardous
EWC Code:	Not Applicable
Estimated Quantity:	<14,000m3 per day
Onsite Storage:	None – Incineration by Ground Flare
Storage Duration:	Not Applicable
Odour Potential:	No Odour Anticipated

6.3.2 Non-Extractive Waste

During hydrocarbon production, near wellbore treatments and proppant squeeze, there may be non-extractive wastes generated onsite, including:

- Surface run-off water;
- Waste water and sewage;
- Waste engine, gear and lubricating oils;
- Waste hydraulic oils;

- Oil rags and absorbents;
- Waste oil filters;
- Paper and cardboard;
- Canteen waste;
- Wood; and
- Metal.

For clarity, the proposed development does not require nor does it propose the installation of a permanent connection to the existing sewerage. During hydrocarbon production a welfare unit is provided onsite, which has its own independent under-unit sewage tank. During short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, when a number of personnel will be onsite will be at its greatest, temporary welfare facilities will be provided onsite, each facility having an independent under-unit sewage tank.

Sewage will be collected periodically throughout the periods when the wellsite is manned and removed by licenced waste carrier to an Environment Agency permitted waste water treatment works for subsequent treatment and/or disposal. The criteria for determining whether waste will be recycled or disposed of will be determined by the receiving waste treatment facility upon receipt of the waste at the treatment facility. The waste will be tested by the waste treatment facility, the results of which will determine the treatment and/or disposal method to be used. Such treatment and/or disposal method will be in accordance with the waste treatment facility's environmental permits.

There will be no treatment or disposal of non-extractive waste onsite and any storage will be limited to temporary storage, pending collection. No temporary storage of non-extractive waste will exceed 12 months.

6.3.3 Waste Supervision and Carriers

The Egdon Resources HSE and Production Manager will undertake the management of waste generated at the wellsite during hydrocarbon production. During the short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, the management of waste generated at the wellsite will be delegated to the Wellsite Supervisor, appointed by Egdon Resources to exercise overall control of the wellsite operations, in accordance with the Borehole Sites and Operations Regulations 1995 and the Waste (England and Wales) Regulations 2011.

The management of waste onsite will include:

- Management of waste in accordance with the waste hierarchy, as set out in the Waste (England and Wales) Regulations 2011;
- Monitoring of all waste storage units such as skips and storage tanks;
- Liaison with third party waste advisors with respect to sampling and analysis of waste;
- Compiling all waste transfer notes; and
- Managing the collection and offsite disposal of all waste streams.

Egdon Resources will appoint competent waste dealers and carriers, responsible for the transportation of all waste streams to the relevant Environment Agency permitted waste treatment facility. Waste dealers and

carriers will hold relevant certificates issued by the Environment Agency, which shall be inspected prior to being appointed.

6.3.4 Wellsite Supervisor

The Egdon Resources HSE and Production Manager is responsible for the day to day supervision of the Wressle wellsite during hydrocarbon production. When production has stabilised, the wellsite will be manned during daytime hours only, with a nominated production supervisor onsite. The Egdon Resources HSE and Production Manager will be responsible for the Health and Safety of personnel, contractors and public and the implementation of any identified environmental requirements to ensure that operations do not have an adverse impact on the environment during hydrocarbon production, including waste management.

During the short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, the supervision of the Wressle wellsite will be delegated to the Wellsite Supervisor, appointed by Egdon Resources to exercise overall control of the wellsite operations, in accordance with the Borehole Sites and Operations Regulations 1995 and the Waste (England and Wales) Regulations 2011.

The Wellsite Supervisor will be responsible for the Health and Safety of personnel, contractors and public and the implementation of any identified environmental requirements to ensure that operations do not have an adverse impact on the environment during the short duration well operations, including waste management. The onsite waste broker will report to the wellsite supervisor and provide advice where necessary to ensure that the management of waste has been undertaken in compliance with legislation and the waste hierarchy.

All Wellsite Supervisors will hold the relevant certificates and will be sufficiently experienced in accordance with the Egdon Resources Safety and Environmental Management System. The appointed Wellsite Supervisor will have:

- Minimum 5+ years' experience in wellsite supervision and in oil and gas drilling and production technologies;
- Current IWCF certification;
- Experience of well engineering, operation standards and applicable industry best practices;
- Experience in emergency response procedures;
- Understanding and application of applicable legislation, including but not limited to, the Offshore Installation and Wells (Design and Construction etc) Regulations 1996, Borehole Sites and Operations Regulation 1995 and be aligned with any revisions therewith.

7. ENVIRONMENTAL RISK ASSESSMENT

An Environmental Risk Assessment has been carried out in support of the permit variation and is based upon the Environment Agency guidance provided on the www.gov.uk website.

The environmental risk assessment follows the following structure:

- Identify the risk from the activity;
- Assess risks and check they are acceptable;
- Justify appropriate measures to control the risk (if needed); and
- Present the risk assessment.

A copy of the environmental risk assessment, together with a supporting statement and conceptual model, is included within 'Wressle-1 Environmental Risk Assessment' (ER-EPRA-W1-ERA-007) provided in support of the environmental permit variation.

8. MEASURES TO MINIMISE ENVIRONMENTAL IMPACT

Measures to minimise the environmental impact of hydrocarbon production, near wellbore treatments and proppant squeeze have been incorporated as part of the initial site selection process, site design and construction. The measures to mitigate long term environmental impact are:

- Site located suitable distance from residential properties;
- Site located away from any statutory designated areas;
- Hydrogeological risk assessment;
- Site design to include impermeable membrane and containment ditches;
- Wellbore lifecycle design to protect groundwater;
- Hierarchy of waste management;
- Operating procedures and inductions;
- Waste handling, storage and disposal regime;
- Continuous training and development;
- Environmental monitoring; and
- Restoration and aftercare.

9. CONTROL AND MONITORING OF WASTE

The environmental risk assessment has identified the requirement to control and monitor waste generated from hydrocarbon production, near wellbore treatments and proppant squeeze. A brief description of the control and monitoring of waste is provided below.

9.1 Releases to Groundwater

The potential for a release to groundwater exists both at surface and within the subsurface and have been assessed by way of a Hydrogeological Risk Assessment, which is included within the Site Condition Report (ER-EPRA-W1-SCR-006), submitted together with the Waste Management Plan (ER-EPRA-W1-WMP-005) in support of the Wressle-1 permit variation application.

9.1.1 Surface Release

Incorporated into the design of the Wressle wellsite is an impermeable membrane constructed using a Bentomat clay membrane which is a self-sealing product. The impermeable membrane prevents surface fluids (mainly rainwater) from penetrating the underlying subsoils. Surface fluids migrate along the surface of the impermeable membrane to a perimeter ditch, where it is contained.

Prior to installation, the existing containment ditch will be assessed to ensure it retains integrity, if it is evident that the performance of the Bentomat impermeable membrane has been compromised, remedial work will be undertaken to reinstate integrity prior to operations commencing onsite.

Ordinarily, surface fluids contained with the perimeter ditch is simply surface run-off water (often referred to as roof water), which subject to being determined as clean, will be discharged to surface water via a Class 1 Oil-Water Separator to Ella Beck, which is located immediately north of the wellsite. An additional safeguard will be to restrict the discharge of surface water during short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, where temporary equipment onsite increases the potential for a

minor spill to occur. During short duration well operation, surface run-off water will be contained onsite for subsequent offsite treatment and disposal at an Environment Agency permitting waste treatment facility.

Surface water collected within the permanent containment bund and permanent tanker loading area within the wellsite will be collected and stored temporarily onsite for subsequent offsite treatment and disposal at an Environment Agency permitted waste treatment facility. The containment bunds will be fitted with automated sump pumps, which will transfer the water to holding tanks.

Periodic inspections of the permanent containment bund, permanent tanker loading area storage tanks will be undertaken by the Egdon Resources HSE and Production Manager. The inspections will aid early identification of any potential release to site from equipment which deteriorates over time.

During short duration well operations, daily inspections of the drainage ditch and any other temporary bunds are undertaken by the Egdon Resources Wellsite Supervisor to ensure the level does not exceed the maximum containment. If the level is close to reaching the maximum containment, the surface fluids will be transferred to road tanker for subsequent offsite treatment and disposal at an Environment Agency permitted waste treatment facility.

A daily inspection of all temporary tanks and other temporary waste storage containers will be undertaken to ensure they remain fit for purpose. The inspections will aid early identification of any potential release to site from equipment which deteriorates over time.

9.1.2 Subsurface Release

Subsurface releases are mitigated by adopting the best practice approach to wellsite construction, hydrocarbon production and short duration well operations, including near wellbore treatments and proppant squeeze operations.

9.1.3 Groundwater Quality Monitoring

Included within the Hydrogeological Risk Assessment is an outline scheme of groundwater quality monitoring. The outline scheme of monitoring has been prepared in support of the Wressle-1 permit variation application and, once implemented, will demonstrate the effectiveness of mitigation measures.

The outline scheme of monitoring provides for the drilling of four (4) monitoring boreholes, three (3) shallow boreholes up to depth of approximately 5m to target the shallow water systems and one (1) deeper borehole to a depth of up to 50m to target the Lincolnshire Limestone formation. A baseline groundwater characterisation will be established prior to hydrocarbon production, against which any changes in chemical and physical attributes during hydrocarbon production, near wellbore treatments and proppant squeeze can be measured.

9.2 Releases to Air

Air quality monitoring has been established for the Wressle wellsite, which is described in detail within the Wressle Site Condition Report (ER-EPRA-W1-SCR-006).

A scheme of air quality monitoring may be undertaken during the initial phase of hydrocarbon production to monitor compliance with Air Quality Objectives (AQO) or relevant Limit Values, as may be set by the Environment Agency. Results of the air quality monitoring scheme will be made available for inspection by the

Environment Agency and will form part of the scheduled emissions submission as part of the environmental permit.

All storage tanks onsite require the ability to vent, in order to allow the displacement and replacement of air as the tanks are filled and offloaded respectively. The storage tanks onsite will be connected via a vent line manifold to a single release point located within the north east corner of the active area of the wellsite.

9.4 Wellsite Monitoring

The Egdon Resources HSE and Production Manager is responsible for the day to day monitoring of the Wressle wellsite during hydrocarbon production. When production has stabilised, the wellsite will be manned during daytime hours only, with a nominated Production Supervisor onsite. The Egdon Resources HSE and Production Manager will identify potential leaks and emissions from permanent site equipment and materials stored within the site and ensure that any action required to remediate such leaks or emissions is undertaken as soon as they are identified, thus preventing potential impact on the environment.

During the short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, the supervision of the Wressle wellsite will be delegated to the Wellsite Supervisor, appointed by Egdon Resources to exercise overall control of the wellsite operations, in accordance with the Borehole Sites and Operations Regulations 1995 and the Waste (England and Wales) Regulations 2011.

The Wellsite Supervisor will be responsible for monitoring the wellsite and temporary well operations equipment and will identify potential leaks and emissions from such temporary equipment and temporary materials stored within the site and ensure that any action required to remediate such leaks or emissions is undertaken as soon as they are identified, thus preventing potential impact on the environment.

During sort duration well operations, a written record of monitoring (Environmental Checklist) will be completed as part of the monitoring schedule by the Wellsite Supervisor. Copies of the Environmental Checklist will be held onsite and will be made available for review by the Environment Agency.

9.5 Contractor Performance

Egdon Resources is ultimately responsible for any waste generated onsite during the hydrocarbon production, and short duration well operations. Egdon Resources will not delegate its responsibilities or accountabilities as Operator to a contractor.

Contractors, who are involved in the generating of waste and subsequent reuse, recycle or disposal will first have been selected in accordance with the Egdon Resources Safety and Environmental Management System.

9.6 Security

Security of the wellsite is provided in the form of a 2m high 138.5m by 80.5m security fence and lockable access gates. The positioning of, both permanent and temporary equipment, including the groundwater quality monitoring boreholes, will be within the confines of the security fence.

The wellsite will be fitted with an intruder alarm system. CCTV system may also be installed.

During short duration well operations it may be necessary to have manned security. Manned security will control access and egress to the wellsite and will play a key role in the control of personnel in the event of an

emergency situation, in accordance with the Site Safety Document, a requirement of the Borehole Sites and Operations Regulations 1995.

9.7 Complaints

In the event that a complaint is received from stakeholders, including neighbours, the complaint shall be recorded and investigated in accordance with the Egdon Resources Safety and Environmental Management System *Incident Management Procedure*.

Complaints relating to the environment will be reported to the Environment Agency within the required timescales, as determined by the severity and environmental impact of the incident initiating the complaint and/or permit conditions. In some cases, permit conditions may require notification the Environment Agency within 24 hours or without delay for a potentially polluting incident.

Following notification, measures to prevent reoccurrence will be agreed with the Environment Agency, together with a programme for implementation. Implementation of the actions will be monitored and the Environment Agency informed.

10. ENVIRONMENTAL INCIDENT MANAGEMENT

The potential for an environmental incident to occur during the hydrocarbon production and short duration well operations is minimal. The source of such incident is contained within the wellbore and contained within the wellsite.

10.1 Containment within the Wellbore

Pressure control equipment is deployed on the well in accordance with the relevant American Petroleum Institute (API) Recommended Practices (RP) and/or applicable British Standard (BS).

During short duration well operations, well control equipment and/or pressure control equipment will be deployed on the well in accordance with the relevant American Petroleum Institute (API) Recommended Practices (RP) and/or applicable British Standard (BS).

Well control equipment and/or pressure control equipment is subject to a schedule of certification and testing, together with a requirement for those operating well control equipment to be certified competent.

10.2 Wellsite Containment

Incorporated into the design of the Wressle wellsite is an impermeable membrane constructed using a bentomat clay membrane which is a self-sealing product. The impermeable membrane prevents surface fluids (mainly rainwater) from penetrating the underlying subsoils. Surface fluids migrate along the surface of the impermeable membrane to a perimeter ditch, where it is contained.

Ordinarily, surface fluids contained with the perimeter ditch is simply surface run-off water (often referred to as roof water), which subject to being determined as clean, will be discharged to surface water via a Class 1 Oil-Water Separator to Ella Beck, which is located immediately north of the wellsite. An additional safeguard will be to restrict the discharge of surface water during short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, where temporary equipment onsite increases the potential for a

minor spill to occur. During short duration well operations, surface run-off water will be contained onsite for subsequent offsite treatment and disposal at an Environment Agency permitted waste treatment facility.

Surface water collected within the permanent containment bund and permanent tanker loading area within the wellsite will be collected and stored temporarily onsite for subsequent offsite treatment and disposal at an Environment Agency permitted waste treatment facility. The containment bunds will be fitted with automated sump pumps, which will transfer the water to holding tanks.

In addition, general spill containment and clean up equipment is provided onsite. In the very unlikely event of an environmental incident occurring beyond the capabilities of the equipment or personnel onsite then a specialist contractor, for example Veolia Environmental Services, will be called to assist Egdon Resources in dealing with the incident.

10.3 Fire Response

Whilst a fire is associated more so with the health and safety of the personnel onsite, a fire does have the potential to lead to an environmental incident. It is imperative, therefore, that any potential for a fire and subsequent emergency response is identified and included in the operational planning. The Site Safety Document, which is a requirement under Regulation 7 of the Boreholes Sites and Operations Regulations 1995, specifies the arrangements for identification and mitigation in the event of a fire, including consultation with the local Fire & Rescue Service.

Containment of any firefighting fluid is provided by the impermeable membrane incorporated in to the design of the wellsite. In the event that such requirements were to be necessary, continued monitoring of the containment ditch shall be implemented to ensure it does not exceed its containment capacity.

Additional water is available onsite and should be used to keep the areas adjacent to the fire cool to avoid any damage being sustained to the impermeable membrane.

10.4 Incident Reporting and Investigation

All incidents, no matter how minor, are reported in accordance with the Egdon Resources Safety and Environmental Management System *Incident Management Procedure*. The procedures therein provide for the investigation of all incidents to ensure lessons are captured and actions implemented to avoid reoccurrence.

In addition, the procedure provides for the notification to the relevant Regulatory Authority in the event of an incident which extends beyond the containment of the wellsite.

Environmental incidents will be reported to the Environment Agency within the required timescales, as determined by the severity and environmental impact of the incident and/or permit conditions. In some cases, permit conditions may require notification to the Environment Agency within 24 hours or without delay for a potentially polluting incident.

Following notification, measures to prevent reoccurrence will be agreed with the Environment Agency, together with a programme for implementation. Implementation of the actions will be monitored and the Environment Agency informed.

11. ALTERATIONS TO THE PLAN

Any required changes or deviations from the Waste Management Plan (ER-EPRA-W1-WMP-005) are to be referred to the Egdon Resources HSE and Production Manager or, during short duration well operations, to the Egdon Resources Wellsite Supervisor in the first instance. No changes to or deviations from the Waste Management Plan (ER-EPRA-W1-WMP-005) are to be implemented until the required changes or deviations have been reviewed and approved by Egdon Resources and the relevant approvals obtained in writing from the Environment Agency for any changes to the plans and operating techniques approved under the environmental permits to be issued.

Within the environmental permits there will be a requirement for the operator, Egdon Resources, to review the Waste Management Plan (ER-EPRA-W1-WMP-005) every five (5) years and amend where necessary. The review date shall take place five (5) years from the date of permit issue. Reviews and amendments will also be required in the event of a substantial change(s) to the operations taking place onsite.

In some cases, changes to operations may require the environmental permit to be varied in order to accommodate such changes. In this instance an application will be made to the Environment Agency to vary the existing permit or apply for a new permit.

12. PLAN FOR CLOSURE

Upon cessation of hydrocarbon production, the well will be abandoned in accordance with Oil & Gas UK *Guidelines for the suspension and abandonment of wells*, and the wellsite restored to its former use.

In such an event, a closure plan will be created in accordance with section 3.4 of the Environment Agency's guidance "How to comply with your environmental permit, additional guidance for: mining waste operations" as part of any application to surrender the environmental permit.

Other regulations relevant to the closure plan include:

- The Borehole Sites and Operations Regulations 1995;
- Offshore Installations and Wells (Design & Construction, etc) Regulations 1996; and
- Petroleum Act 1998 (Petroleum Exploration and Development Licence).

Document:	**Site Layout Plans**
Document Number:	**ER-EPRA-W1-SP-004**

Site Layout Plans

Wressle Wellsite

Wressle-1

Hydrocarbon Production and Short Duration Well Operations, including Near Wellbore Treatments and Proppant Squeeze Operations

3rd June 2016

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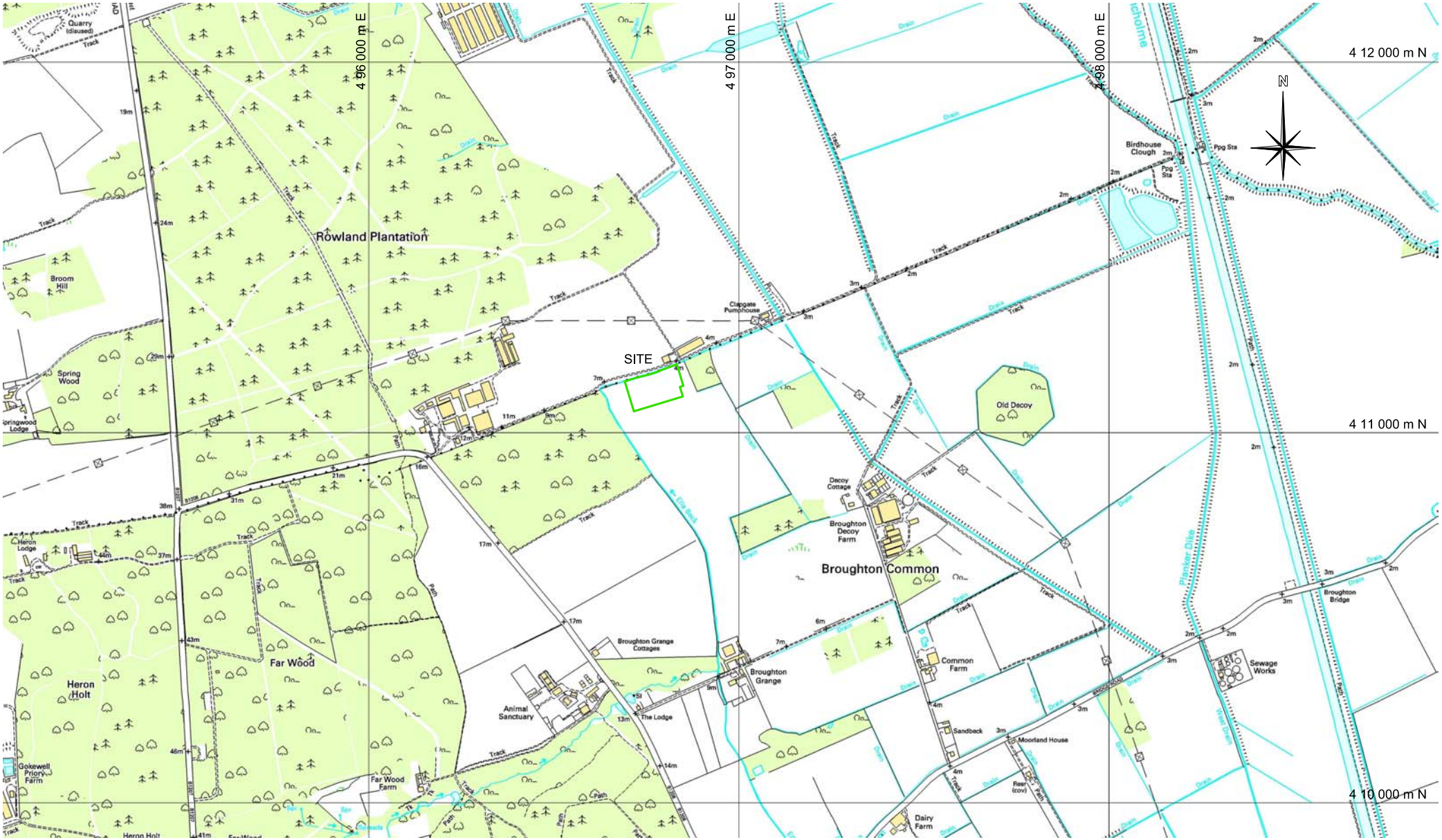

Site Location Plan

Scale 1:10,000

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Client: Egdon Resources UK Ltd Wressle Brigg Lincolnshire	Drawn By: AJNE	Date: February 2013	Sheet Size: A3
Job Title: Wressle Site	Drawing Title: Site Location Plan (1:10,000)		
	Drawing Number: 3334 EA 01		Revision:

Site of Application

Scale 1:2500

0 25m 50m

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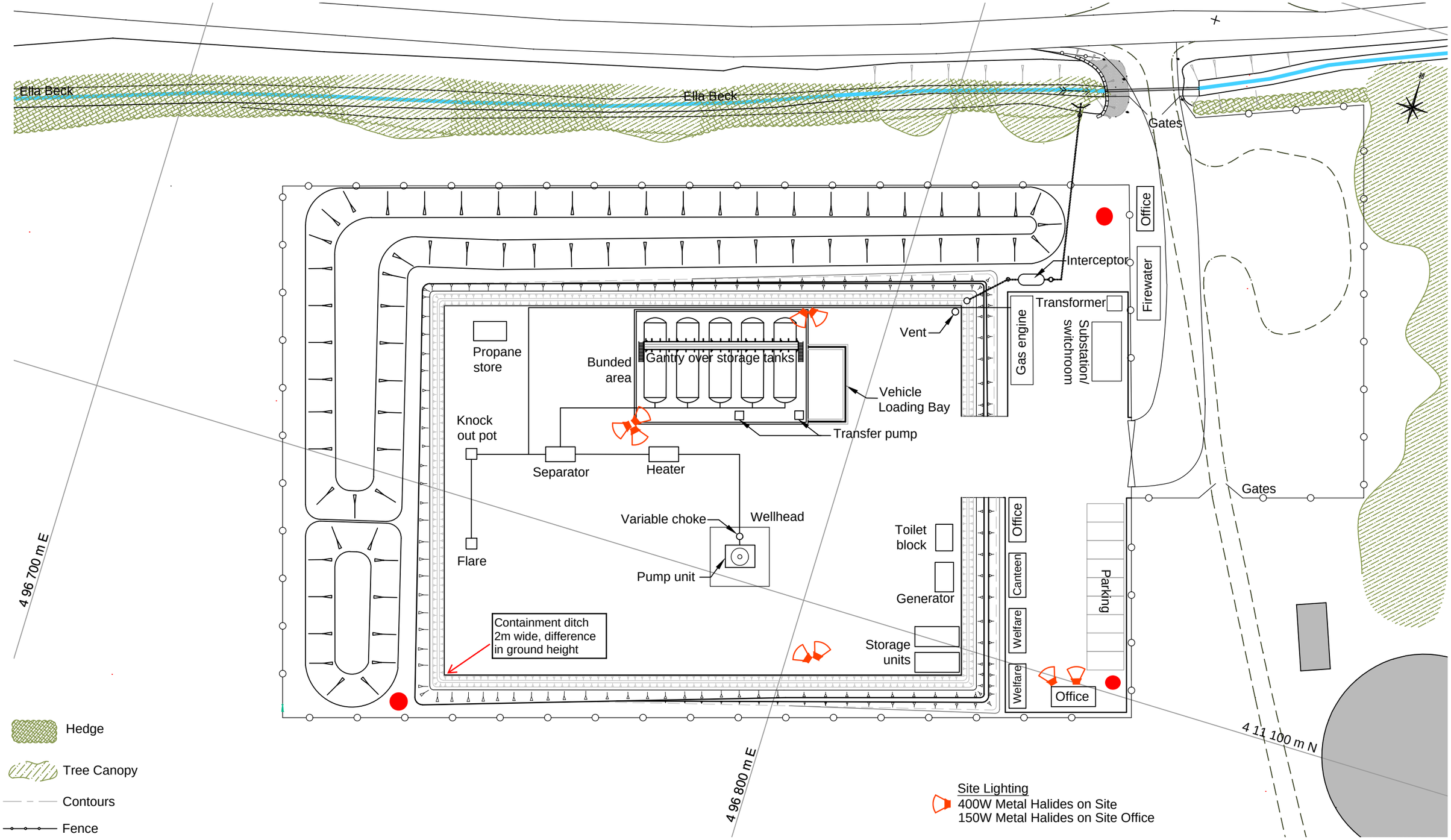
Client: Egdon Resources UK Ltd Wressle Brigg Lincolnshire	Drawn By: AJNE	Date: February 2013	Sheet Size: A3
Job Title: Wressle Site	Drawing Title: Site of Application (1:2,500)		
	Drawing Number: 3334 EA 02		Revision:



Indicative Site Layout Plan - Production

Scale 1:500

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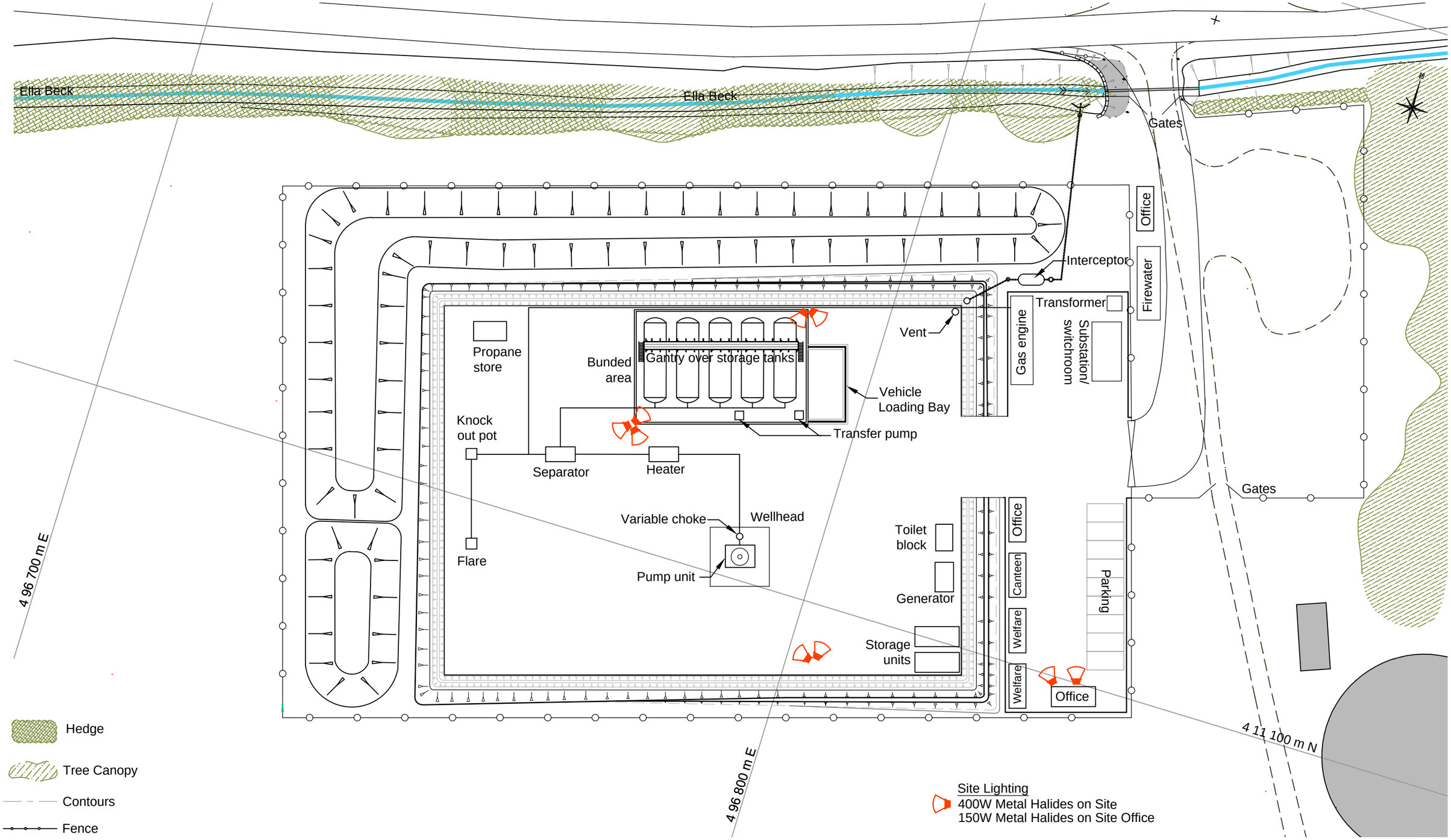
Client: Egdon Resources UK Ltd Wressle Brigg Lincolnshire	Drawn By: AJNE	Date: April 2016	Sheet Size: A3
	Drawing Title: Indicative Site Layout Plan Production (1:500)		
Job Title: Wressle Site	Drawing Number: 3334(2) Prelim 04		Revision: E



Indicative Site Layout Plan - Production

Scale 1:500

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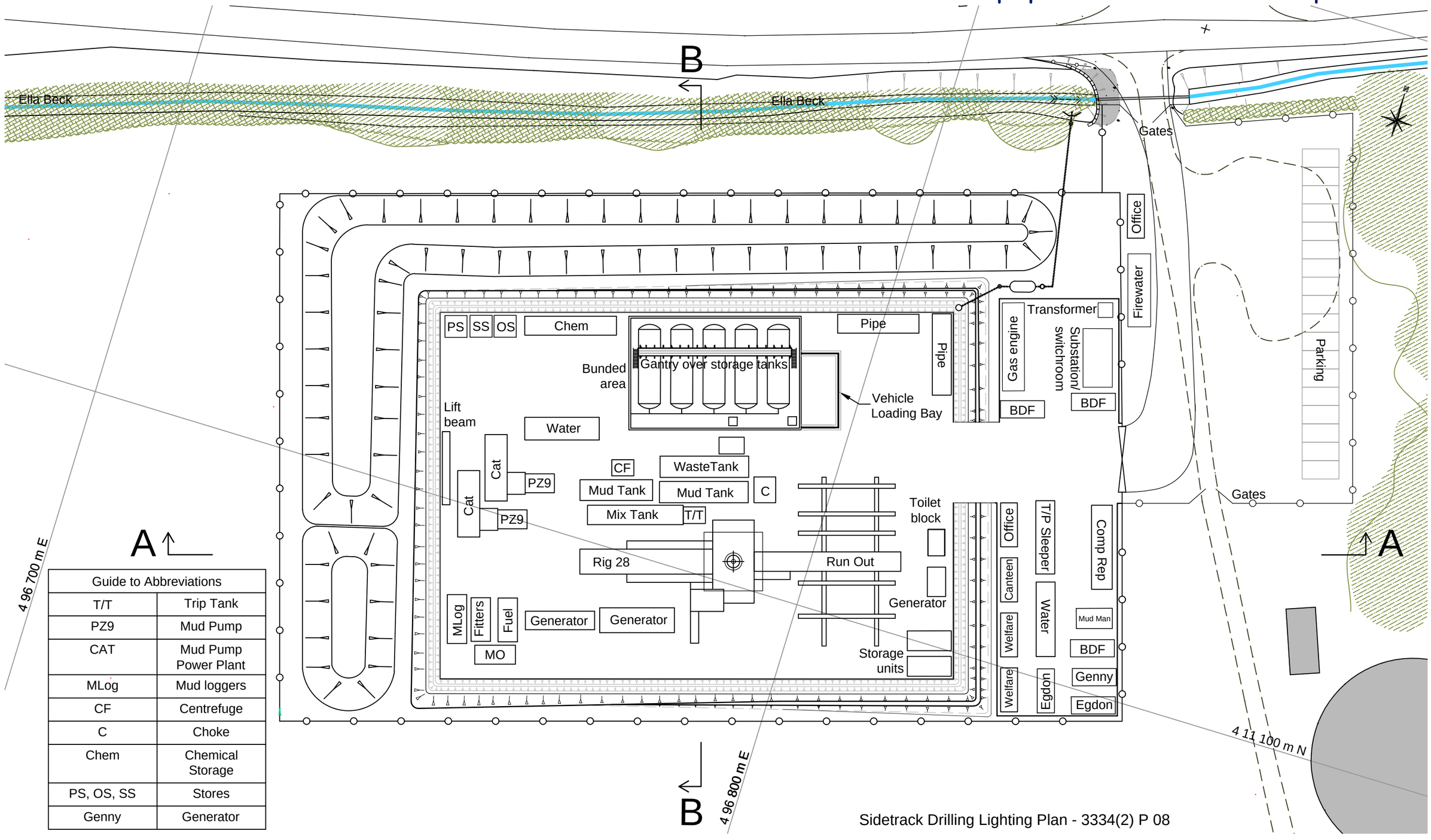
Client: Egdon Resources UK Ltd Wressle Brigg Lincolnshire	Drawn By: AJNE	Date: April 2016	Sheet Size: A3
	Drawing Title: Indicative Site Layout Plan Production (1:500)		
Job Title: Wressle Site	Drawing Number: 3334(2) Prelim 04		Revision: E



Guide to Abbreviations	
T/T	Trip Tank
PZ9	Mud Pump
CAT	Mud Pump Power Plant
MLog	Mud loggers
CF	Centrefuge
C	Choke
Chem	Chemical Storage
PS, OS, SS	Stores
Genny	Generator

Sidetrack Drilling Lighting Plan - 3334(2) P 08

Indicative Site Layout Plan - Sidetrack Drilling

Scale 1:500

0 5m 10m

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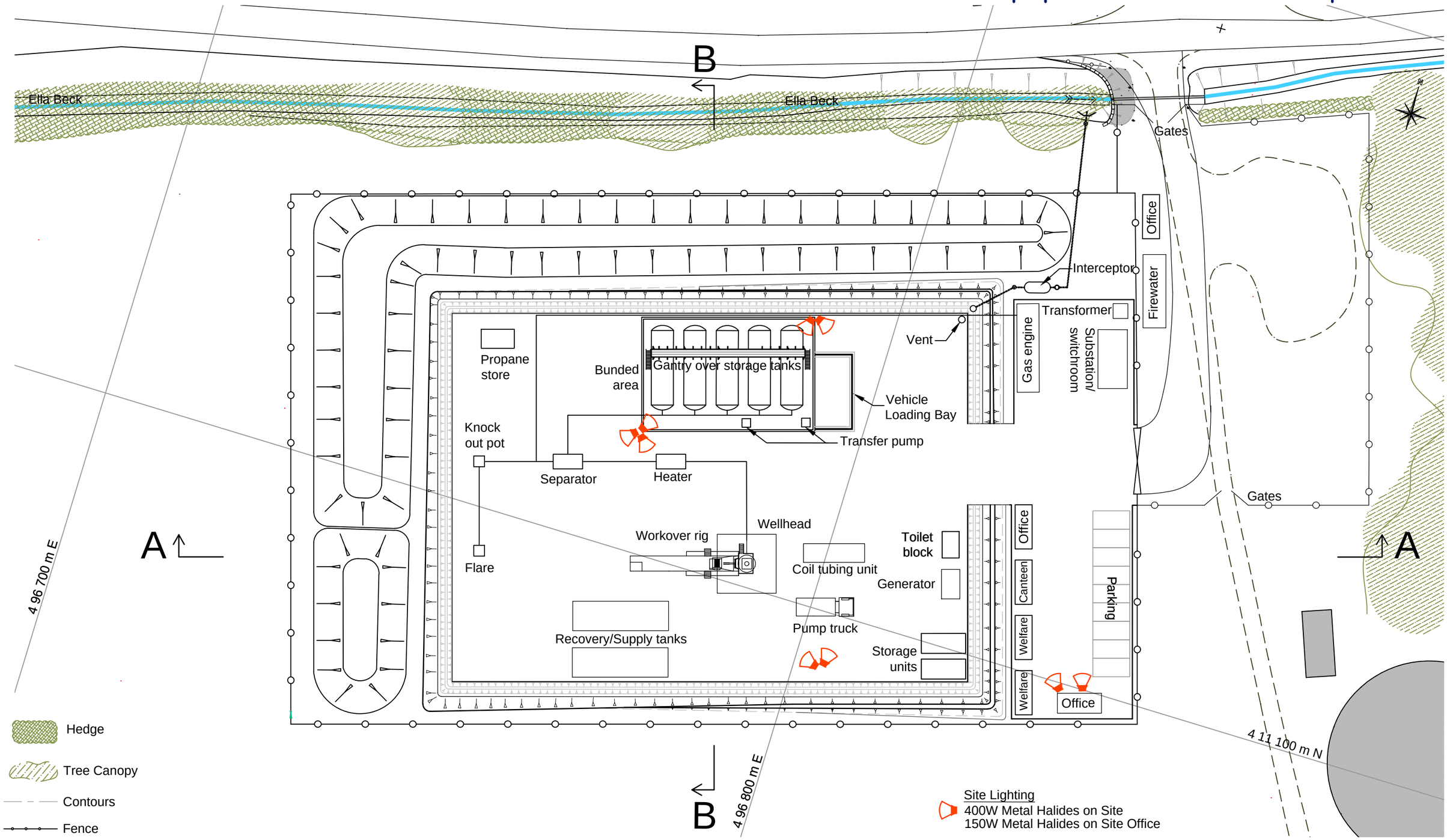
Client: Egdon Resources UK Ltd Wressle Brigg Lincolnshire	Drawn By: AJNE	Date: April 2016	Sheet Size: A3
Job Title: Wressle Site	Drawing Title: Indicative Site Layout Plan Sidetrack Drilling (1:500)		
	Drawing Number: 3334(2) P 07		Revision:



Indicative Site Layout Plan - Radial Drilling

Scale 1:500

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Client: Egdon Resources UK Ltd Wressle Brigg Lincolnshire	Drawn By: AJNE	Date: April 2016	Sheet Size: A3
Job Title: Wressle Site	Drawing Title: Indicative Site Layout Plan Radial Drilling (1:500)		
	Drawing Number: 3334(2) P 10		Revision:

4 96 000 m E
4 97 000 m E
4 98 000 m E
4 12 000 m N
4 11 000 m N
SITE
Rowland Plantation
Far Wood
Broughton Common
Heron Holt
Spring Wood
Broom Hill
Clapgate Pumphouse
Old Decoy
Decoy Cottage
Broughton Decoy Farm
Broughton Grange Cottages
Broughton Grange
Animal Sanctuary
The Lodge
Far Wood Farm
Heron Lodge
Springwood Lodge
Gokewell Priory Farm
Common Farm
Sandbeck
Moorland House
Dairy Farm
Broughton Bridge
Sewage Works
Birdhouse Clough
Ppg Sta
Ella Beck
Planker Dike
Extent of Subsurface Mining Waste Facility
Site Boundary
Extent of Subsurface Waste Mining Facility
0 100m 200m

Extent of Subsurface Mining Waste Facility

Scale 1:10,000

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Client: Egdon Resources UK Ltd Wressle Brigg Lincolnshire	Drawn By: AJNE	Date: May 2016	Sheet Size: A3
Job Title: Wressle Site	Drawing Title: Extent of Mining Waste Facility (1:10,000)		
	Drawing Number: 3334(2) EA 01		Revision:

Waste Management Plan

Wressle Wellsite

Wressle-1

Hydrocarbon Production and Short Duration Well Operations, including Near Wellbore Treatments and Proppant Squeeze Operations

3rd June 2016

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CONTENTS

1. Introduction 5
1.1 Site Details 5
2. Scope 6
3. Definitions 7
4. Environmental Legislation and Applicability 9
4.1 Water Resources Act 1991 (as amended by the Water Act 2003) 9
4.2 Environmental Permitting (England and Wales) Regulations 2010, as amended 9
4.2.1 Water Discharge Activity & Groundwater (Point Source) Activity 9
4.2.2 A Mining Waste Activity 10
4.2.3 An Industrial Emissions Activity 14
4.2.4 A Radioactive Substances Activity 15
5. Description of the Facility 16
5.1 Site Location 16
5.2 Site Description and Current Status 16
5.3 Waste Generating Activities 18
5.3.1 Drilling of Wressle-1 Sidetrack Well 18
5.3.2 Radial Drilling Operations 19
5.3.3 Near Wellbore Treatments 19
5.3.4 Proppant Squeeze 21
5.3.5 Hydrocarbon Production from Wressle-1 Well 24
5.3.6 Well Abandonment and Partial Well Abandonment 26
5.4 Classification of Operations 27
5.4.1 A Water Discharge Activity & Groundwater (Point Source) Activity 27
5.4.2 Mining Waste Operation and Mining Waste Facility 27
5.4.3 Installations Activity 28
5.4.4 A Radioactive Substances Activity 28
6. Extractive and Non-Extractive Waste Management 29
6.1 Operator Waste Objectives 29
6.2 Waste Prevention and Minimisation 31
6.2.1 Waste Prevention 31
6.2.2 Preparing for Re-Use 31
6.2.3 Recycle 31

6.2.4 Other Recovery 31
6.2.5 Dispose 31
6.3 Waste Description and Management Arrangements 31
6.3.1 Extractive Waste 32
6.3.2 Non-Extractive Waste 42
6.3.3 Waste Supervision and Carriers 42
6.3.4 Wellsite Supervisor 43
7. Environmental Risk Assessment 44
8. Measures to Minimise Environmental Impact 45
9. Control and Monitoring of Waste 45
9.1 Releases to Groundwater 45
9.1.1 Surface Release 45
9.1.2 Subsurface Release 46
9.1.3 Groundwater Quality Monitoring 46
9.2 Releases to Air 46
9.4 Wellsite Monitoring 47
9.5 Contractor Performance 47
9.6 Security 47
9.7 Complaints 48
10. Environmental Incident Management 48
10.1 Containment within the Wellbore 48
10.2 Wellsite Containment 48
10.3 Fire Response 49
10.4 Incident Reporting and Investigation 49
11. Alterations To The Plan 50
12. Plan For Closure 51
Appendix 1 – Corporate Information 53
Appendix 2 – Management System Summary 57
Appendix 3 – Proppant Carrier Fluid Disclosure 59
Appendix 4 – Flare Specification 61

1. INTRODUCTION

Egdon Resources U.K. Limited (Egdon Resources) is a subsidiary of Egdon Resources PLC, which was formed in 1997 and was awarded its first licence in 1998 and gained its first operated licence in 2000. Under the Petroleum Licensing system this permits the licence holder to '*search and bore for and get petroleum within the licence boundary*' subject to the granting of planning permission, in accordance with the Town and Country Planning Act 1990. Egdon Resources is an international petroleum exploration, development and production company with operations in the United Kingdom and France. The United Kingdom operations are conducted through Egdon Resources U.K. Limited and are directed from the registered office in Hampshire.

Egdon Resources is engaged in the exploration and production of petroleum onshore United Kingdom and holds 25% in the Petroleum Exploration and Development Licence 180 (PEDL 180) with the remaining interest held by Europa Oil and Gas (33.34%), Celtique (33.33%) and Union Jack Oil (8.33%). Within PEDL 180, Egdon Resources, as the operator, have successfully drilled and tested the Wressle-1 exploratory borehole.

Egdon Resources has previously obtained a permit (EPR/AB3609XX) from the Environment Agency to operate a mining waste operation at the Wressle wellsite, during the drilling and subsequent testing of the Wressle-1 well.

The purpose of this document is to outline the waste management arrangements to be implemented at the Wressle wellsite during hydrocarbon production from the Ashover Grit and other formations, which may include short duration well operations, such as sidetrack drilling, radial drilling, near wellbore treatments and proppant squeeze.

1.1 Site Details

The location of the Wressle wellsite, within which production of hydrocarbons from the Ashover Grit and other formations will be undertaken, is as follows:

Wressle Wellsite
Lodge Farm
Clapp Gate
Broughton and Appleby
DN15 0DB

National Grid Ref:	Easting: 496772 Northing: 411102
Site Area:	1.27 hectares.

The site surface boundary is detailed in green on the site plans included within ER-EPRA-W1-SP-004

2. SCOPE

This Waste Management Plan is applicable to the Wressle wellsite and all hydrocarbon production operations and short duration well operations therein, in accordance with environmental permits and planning consent, both currently being sought in parallel by Egdon Resources.

It is applicable to Egdon Resources, its contractors and subcontractors and can be used in support of applications and variations to the Environment Agency under the Environmental Permitting (England and Wales) Regulations 2010, as amended (EPR 2010), where there is a requirement to provide a Waste Management Plan and is specifically for an application or variation to operate a Mining Waste Operation, whether or not it includes a Mining Waste Facility.

Environmental Permits, which are subject to the Mining Waste Directive, cover the management of extracted waste and not the extraction process. This Waste Management Plan has been drafted such that it aligns with the management of extracted waste and not the extraction process.

This Waste Management Plan is the principle document for the management of all waste activities permitted at the Wressle wellsite under applicable environmental legislation.

3. DEFINITIONS

BAT:	Best Available Technique
Class 1 SPEL:	A separator designed to achieve a concentration of less than 5mg/l of oil within surface water discharges. Class 1 are approved by the Environment Agency.
EPR 2010:	Environmental Permitting (England and Wales) Regulations 2010
Hazardous Waste:	As defined by Article 3(2), 7 and Annex III of the Waste Framework Directive
HCI:	Hydrochloric Acid
HF:	Hydrofluoric Acid
Hot Oiling:	The circulating of hot oil (oil produced from the target formation) down the production tubing and back to surface, dissolving any wax build up within the tubing
HSE:	Health, Safety and Environment
Inert Waste:	A waste that does not undergo any significant physical, chemical or biological transformations. Does not give rise to environmental pollution or harmful to health
JAGDAG:	Joint Agencies Groundwater Directive Advisory Group
Kg:	Kilograms
m:	Metres
m^3:	Meters Cubed
mm:	Millimeters
MDRT:	Measured Depth below Rotary Table
Non Hazardous Waste:	A waste which is not classified as inert or hazardous waste
NORM:	Naturally Occurring Radioactive Material
Pollutant:	Any substance liable to cause pollution
Pollution:	A direct or indirect introduction, as a result of human activity, of substances or heat into the air, water land which may; a) Be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems b) Result in damage to material property c) Impair or interfere with amenities or other legitimate uses of the environment
Psi:	Pounds per square inch
Scf:	Standard Cubic Feet.

Scfd:	Standard Cubic Feet per day
Spent Acid (HCl):	Calcium chloride, carbon dioxide and water
TD:	Total Depth
TVD:	True Vertical Depth
W1:	Wressle-1 Well

4. ENVIRONMENTAL LEGISLATION AND APPLICABILITY

Activities associated with the exploration and production of oil and gas onshore in England fall to be considered within the scope of a number of pieces of legislation. A review of environmental legislation against the proposed hydrocarbon production from the Ashover Grit and other formations and short duration well operations, such as near wellbore treatments and proppant squeeze, has identified the following legislation as being applicable.

4.1 Water Resources Act 1991 (as amended by the Water Act 2003)

Under Section 199 of the Water Resources Act 1991 (as amended by the Water Act 2003), a notice of the intention to construct or extend a boring for the purpose of searching for or extracting minerals must be submitted to the Environment Agency using form WR11. The WR11 requires that a method statement, including drilling and casing design, together with storage and use of chemicals and drilling fluids, accompanies the WR11 application form. The Wressle-1 well was the subject of a WR11 application prior to the drilling of the wellbore in 2014. In addition, a second WR11 application will be made to the Environment Agency in due course as and when it is the intention of Egdon Resources to undertake a sidetrack drilling operation from the existing Wressel-1 well.

4.2 Environmental Permitting (England and Wales) Regulations 2010, as amended

A number of activities likely to be undertaken during the hydrocarbon production and short duration well operations, may require permitting under EPR 2010.

4.2.1 Water Discharge Activity & Groundwater (Point Source) Activity

Under Schedule 22 of EPR 2010, an activity that could involve the discharge of pollutants into groundwater must be notified to the Environment Agency, together with the nature of these pollutants. The Environment Agency will then determine whether the groundwater activity needs to be permitted.

During hydrocarbon production from the well, it may be necessary to undertake near wellbore treatments, including an acid squeeze and solvent treatment, all of which fall within the definition of a Groundwater Activity under Schedule 22 of EPR 2010.

Schedule 22 3 (3) of EPR 2010 provides that the *'The regulator may determine that a discharge, or an activity that might lead to a discharge, is not a groundwater activity if the input of the pollutant…*

(b) is or would be of a quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater.

To enable the regulator to deviate from the requirement for a groundwater activity permit, relating to an acid squeeze and solvent treatment, a description of the operations, together with a technical justification to exclude these operations under Schedule 22 paragraph 3 (3) of EPR 2010, is included within Section 5 of this Waste Management Plan.

Also during hydrocarbon production from the well, it may be necessary to undertake a proppant squeeze, should it be deemed necessary to enhance production rates. This activity falls within the definition of a Groundwater Activity under Schedule 22 of EPR2010.

Schedule 22 3 (1) of EPR 2010 provides that '*Subject to sub-paragraphs (2) and (3) "groundwater activity" means any of the following:*

(c) any other discharge that might lead to the direct or indirect input of pollution to groundwater.

Although the risk to groundwater is very low, due to the way in which the Wressle-1 borehole has been constructed, Egdon Resources is taking a precautionary approach by determining the proposed proppant squeeze as requiring a groundwater activity permit.

Schedule 21 of EPR 2010 relates to water discharge activities. Although Egdon Resources proposes to install a Class 1 Oil-Water Separator, an application to discharge clean surface run-off water (often referred to as roof water) will not be required, as the surface water being discharged will be clean. An additional safeguard will be to restrict the discharge of surface water during short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, where temporary equipment onsite increases the potential for a minor spill to occur. During short duration well operations, surface run-off water will be contained onsite for subsequent offsite treatment and disposal at an Environment Agency permitting waste treatment facility.

Surface water collected within the permanent containment bund and permanent tanker loading area within the wellsite will be collected and stored temporarily onsite for subsequent offsite treatment and disposal at an Environment Agency permitting waste treatment facility.

4.2.2 A Mining Waste Activity

The Mining Waste Directive 2006/21/EC require that extractive wastes are managed in such a way that it minimises harm to human health and the impact on the environment. It applies to the management of waste resulting from the prospecting, extracting, treatment and storage of mineral resources and working quarries, which the Mining Waste Directive refers to as extractive waste. The waste can take the form of a solid, liquid or gas.

Schedule 20 of EPR 2010 defines a mining waste operation as being *the management of extractive waste, whether or not it involves a waste facility.* Under EPR 2010, an environmental permit is required to authorise a mining waste operation.

Hydrocarbon production from the well formation and short duration well operations will involve the management of non-hazardous extractive waste, should the following activities be undertaken at the Wressle wellsite:

- Drilling of sidetrack well;
- Radial drilling operations;
- Near wellbore treatment;
- Proppant squeeze; and
- Production of hydrocarbons.

It is anticipated that between 50% and 70% of the proppant carrier fluid used will be retained within the Ashover Grit formation. Article 3 (15) of the Mining Waste Directive defines a waste facility as *any area designated for the accumulation or deposit of extractive waste whether in a solid or liquid state or in solution or suspension, for the following time periods:*

- *No time-period for Category A waste facilities and waste characterised as hazardous in the waste management plan;*
- *A period of more than six months for facilities for hazardous waste generated unexpectedly;*
- *A period of more than one year for facilities for non-hazardous non-inert waste; and*
- *A period of more than three years for facilities for unpolluted soil, non-hazardous prospecting waste, waste, resulting from extraction, treatment and storage of peat and inert waste.*

Not all of the proppant carrier fluid will return to surface. Some will be retained within the Ashover Grit formation for a period exceeding one (1) year. In accordance with Article 3 (15) of the Mining Waste Directive, the Ashover Grit formation within which the proppant fluid is retained is designated a mining waste facility.

As the retained proppant fluid is classified non-hazardous, a Mining Waste Facility categorised M3 has been assigned, based on the Environment Agency permit variation forms (Category C).

Where a mining waste facility is to be considered, a review of the mining waste facility against criteria specified within Annex III of the Mining Waste Directive must be undertaken to determine whether or not the mining waste facility should be classified as a Category A Mining Waste Facility. The criteria for determining a Category A Mining Waste Facility is as follows:

a) A failure or incorrect operation e.g. the collapse of a heap or the busting of a dam, could give rise to a major accident, on the basis of a risk assessment taking into account factors such as the present or future size, the location and the environmental impact of the water facility;
b) It contains waste classified as hazardous under Directive 91/689/EEC above a certain threshold: or
c) It contains substances or preparations classified as dangerous under Directives 67/548/EEC or 1999/45/EC above a certain threshold.

An Environmental Risk Assessment has been undertaken to inform the permit application. The risk assessment did not identify any environmental risk associated with the retention of proppant fluid within the formation being squeezed as having the potential to give rise to a major accident.

The Wressle-1 well was constructed in 2014, in accordance with the Offshore Installation and Wells (Design and Construction, etc.) Regulations 1996. Casing was cemented through sensitive formations, isolating aquifers and groundwater zones. Casing shoes were set into non-porous strata to form a complete seal between well sections. This prevents the direct migration of fluids and gases from the wellbore to the shallow groundwater system during the production and well intervention phases of work.

The majority of the constituents within the proppant fluid are non-hazardous, having been assessed using the Joint Agencies Groundwater Directive Advisory Group (JAGDAG) assessment methodology. The assessment concluded that the majority of constituents assessed for use in the Wressle-1 proppant squeeze are classified as non-hazardous to groundwater. A copy of the JAGDAG substances assessment is provided within Appendix 3 of this Waste Management Plan.

Three (3) constituents have been classified as hazardous, however, due to the extremely low quantity and concentration expected to be used within the Ashover Grit formation, the use of such constituents is considered de-minimis in accordance with Schedule 22 3 (3) of EPR 2010, as the quantity and concentration

so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater within the Ashover Grit formation.

It is anticipated that between 30% and 50% of the proppant fluid will return to surface following the proppant squeeze. The remaining 50% to 70% of the proppant fluid will be retained within the Ashover Grit formation, having been absorbed on the charged, high surface area clays within the formation.

In accordance with Annex III of the Mining Waste Directive, the formation within which the proppant fluid will be retained (Mining Waste Facility) is not considered Category A Mining Waste Facility.

Egdon Resources has previously obtained a permit from the Environment Agency to operate a mining waste operation at the Wressle wellsite. This Waste Management Plan together with additional documents will be used in support of an application to vary the mining waste permit to include a mining waste facility.

Article 5(2) of the Mining Waste Directive sets out the objective of the waste management plan.

(a) to prevent or reduce waste production and its harmfulness, in particular by considering:

(i) waste management in the design phase and in the choice of the method used for mineral extraction and treatment;

(ii) the changes that the extractive waste may undergo in relation to an increase in surface area and exposure to conditions above ground;

(iii) placing extractive waste back into the excavation void after extraction of the mineral, as far as is technically and economically feasible and environmentally sound in accordance with existing environmental standards at Community level and with the requirements of this Directive where relevant;

(iv) putting topsoil back in place after the closure of the waste facility or, if this is not practically feasible, reusing topsoil elsewhere;

(v) using less dangerous substances for the treatment of mineral resources;

(b) to encourage the recovery of extractive waste by means of recycling, reusing or reclaiming such waste, where this is environmentally sound in accordance with existing environmental standards at Community level and with the requirements of this Directive where relevant;

(c) to ensure short and long-term safe disposal of the extractive waste, in particular by considering, during the design phase, management during the operation and after-closure of a waste facility and by choosing a design which:

(i) requires minimal and, if possible, ultimately no monitoring, control and management of the closed waste facility;

(ii) prevents or at least minimises any long-term negative effects, for example attributable to migration of airborne or aquatic pollutants from the waste facility; and

(iii) ensures the long-term geotechnical stability of any dams or heaps rising above the pre-existing ground surface.

In accordance with Article 5(2)(a)(i) of the Mining Waste Directive, the management of waste was identified during the design phase of the hydrocarbon production, near wellbore treatments and proppant squeeze operations from the Ashover Grit formation.

Due to the proppant squeeze being a single activity (not repeated in short duration), the choice of method proposed for flowback water management will involve the offsite treatment and/or disposal at an Environment Agency permitted waste treatment facility.

With reference to Article 5(2)(a)(ii) of the Mining Waste Directive, extractive waste generated during the hydrocarbon production from the Ashover Grit formation or short duration well operations does not undergo any changes in relation to surface area or exposure to conditions above ground. It is the intention that all extractive waste generated during hydrocarbon production will be temporarily stored onsite for subsequent offsite treatment and/or disposal at an Environment Agency permitted waste treatment facility, including reinjection facilities.

Hydrocarbon production from the Ashover Grit formation or short duration well operations will not generate extraction voids nor does current environmental legislation support the reinjection of flowback water from the proppant squeeze operation. Article 5(2)(a)(iii) of the Mining Waste Directive is, therefore, not applicable to the Wressle wellsite.

The Wressle wellsite is subject to a closure plan upon cessation of hydrocarbon production. The closure plan will set out the details for wellsite restoration, including the replacement of topsoil currently stored onsite. The reuse of topsoil after closure accords with Article 5(2)(a)(iv) of the Mining Waste Directive.

With reference to Article 5(2)(a)(v) of the Mining Waste Directive, the majority of the constituents within the proppant fluid are non-hazardous, having been assessed using the Joint Agencies Groundwater Directive Advisory Group (JAGDAG) assessment methodology. A copy of the JAGDAG substances assessment is provided within Appendix 3 of this Waste Management Plan. Three (3) constituents have been classified as hazardous, however, due to the extremely low quantity and concentration expected to be used within the Ashover Grit formation, the use of such constituents is considered de-minimis in accordance with Schedule 22 3 (3) of EPR 2010, as the quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater.

4.2.3 An Industrial Emissions Activity

Industrial Emissions Directive 2010/75/EU lays down rules on integrated prevention of pollution arising from industrial activities, whilst also laying down rules designed to prevent or, where that is not practicable, to reduce the emissions to air, water and land and to prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole.

Schedule 1, Part 2 of EPR 2010 details a number of activities that are classified as an Industrial Emissions activity. These include, but not limited to:

- Chapter 1 - Energy Activities
    - Section 1.1 - Combustions Activities
    - Section 1.2 - Gasification, Liquefaction and Refining Activities
- Chapter 2 - Production and Processing of Metals
    - Section 2.1 - Ferrous Metals
    - Section 2.2 - Non-Ferrous Metals
- Chapter 3 - Mineral Industries
    - Section 3.1 - Production of Cement and Lime
    - Section 3.2 - Activities Involving Asbestos
- Chapter 4 - The Chemical Industry
    - Section 4.1 - Organic Chemicals
    - Section 4.2 - Inorganic Chemicals
- Chapter 5 - Waste Management
    - Section 5.1 - Incineration and Co-incineration of Waste
    - Section 5.2 - Disposal of Waste by Landfill
- Chapter 6 – Other Activities
    - Section 6.1 - Paper, Pulp and Board Manufacturing Activities
    - Section 6.2 - Carbon Activities

Regulation 35 of the Environmental Permitting (England and Wales) (Amended) Regulations 2013, which transposes the requirements of the Industrial Emissions Directive, requires an environmental permit to authorise an installation operation for the incineration and co-incineration of waste specifically Section 5.1 which is described below.

Part A(1)

(a) The incineration of hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 10 tonnes per day;
(b) The incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour; and
(c) The incineration, other than incidentally in the course of burning landfill gas or solid or liquid waste, of any gaseous compound containing halogens.

Hydrocarbon production from the well at the Wressle wellsite will not include the incineration of natural gas exceeding 10 tonnes per day and, therefore, a permit to authorise an installation operation for the incineration of natural gas is not required.

Schedule 1, Part 2 of the EPR 2010 transposes the requirements of the industrial emissions directive, which requires an environmental permit to authorise an installation operation for gasification, liquefaction and refining activities, as detailed within Part A(1) of Schedule 1.2, as detailed below.

Part A(1)

(a) Refining gas where this is likely to involve the use of 1,000 or more tonnes of gas in any 12-month period.
(c) Operating coke ovens.
(d) Gasification or liquefaction of coal or other fuels in installations with a total rated thermal input of 20 megawatts or more.
(g) Refining mineral oils.
(h) The loading, unloading, handling or storage of, or the physical, chemical or thermal treatment of—
  (i) crude oil;
  (ii) stabilised crude petroleum;
(j) Activities involving the pyrolysis, carbonisation, distillation, liquefaction, gasification, partial oxidation or other heat treatment of—
  (i) coal (other than the drying of coal);
  (ii) lignite;
  (iii) oil;
  (iv) other carbonaceous material; or
  (v) mixtures of any of these,

Hydrocarbon production from the Ashover Grit formation will involve the loading, unloading, handling and storage of crude oil within the Wressle wellsite and, as such, an installation permit under Part 2 Schedule 1.2 of EPR 2010 is required. As the proposed activity is located within 50m of a watercourse, the activity falls outwith the conditions set within Standard Rules Permit SR 2015 No2.

4.2.4 A Radioactive Substances Activity

Schedule 23 of EPR 2010 provides for the control of Naturally Occurring Radioactive Material (NORM). Schedule 23 defines the production of oil and gas as a NORM industrial activity and therefore any accumulation of radioactive waste, which exceeds concentrations set out in Table 1 of Schedule 23 of EPR 2010 and its subsequent disposal requires an environmental permit to authorise a radioactive substances activity.

Hydrocarbon production from the Ashover Grit formation and short duration well operations will involve the circulating and/or flowing to surface of fluids exposed to the formation, as a result of near wellbore treatments, proppant squeeze and/or production. These fluids may or may not contain NORM in concentrations exceeding those set out in Table 1 of Schedule 23 of EPR 2010.

Egdon Resources has previously obtained a permit from the Environment Agency (EPR/HB3295DH/A001) for the storage and disposal of radioactive substances, during well testing operations. Whilst the activities proposed during hydrocarbon production from the Ashover Grit formation and short duration well operations may also generate waste classified as radioactive, the activity limits set within the existing radioactive substances permit are deemed to be sufficient.

5. DESCRIPTION OF THE FACILITY

5.1 Site Location

The Wressle wellsite is located within countryside in the county of North Lincolnshire. The wellsite is located approximately 350m east of Sadler's Lodge Farm and is bound to the north by Ella Beck with agricultural land beyond and to the west with a wood approximately 70m to the west. The village of Wressle is located 1.6km north of the wellsite.

The nearest residential property to the wellsite is North Cottage, located approximately 530m to the east. Decoy Cottage is located approximately 580m to the south of the wellsite.

A site location plan has been provided within ER-EPRA-W1-SP-004.

5.2 Site Description and Current Status

The Wressle wellsite is an existing temporary hydrocarbon exploration wellsite granted planning permission by North Lincolnshire Council on 18th June 2013 (Ref: MIN/2013/0281).

The wellsite was constructed in the spring of 2014 and is contained by a 2m high 138.5m by 80.5m security fence. Wellsite construction details are presented within the Wressle Site Condition Report (ER-EPRA-W1-SCR-006).

A mining waste permit (Ref: EPR/AB3609XX) was issued by the Environment Agency in 2014, in advance of the drilling operation.

Following drilling of the Wressle-1 well in 2014, an application to vary the existing mining waste permit and obtain a radioactive substances permit for the testing of the Wressle-1 well was submitted and subsequently approved by the Environment Agency on 6th October 2014.

Well testing operations were undertaken during 2015, which identified the Ashover Grit and other formations as a potential commercially producible hydrocarbon bearing formation. The well was subsequently suspended pending further evaluation and applications to the Minerals Planning Authority and Environment Agency for permission to produce hydrocarbons (oil and associated natural gas) from this formation. The current status of the Wressle-1 well is presented as Figure 5.1 below.

Currently, the wellsite has only a small amount of equipment and facilities within it, including:

- A production tree (a system of valves to manage hydrocarbon flow and well entry) over the wellhead;
- Four storage tanks situated within a temporary bund;
- A site office/cabin; and
- Up to three storage containers.

Earth bunds partially screen the wellsite along the northern and western boundaries. There is a gate at the entrance to the site and parking provision for up to 12 vehicles.

The site boundary is detailed in green on site plans included within ER-EPRA-W1-SP-004.

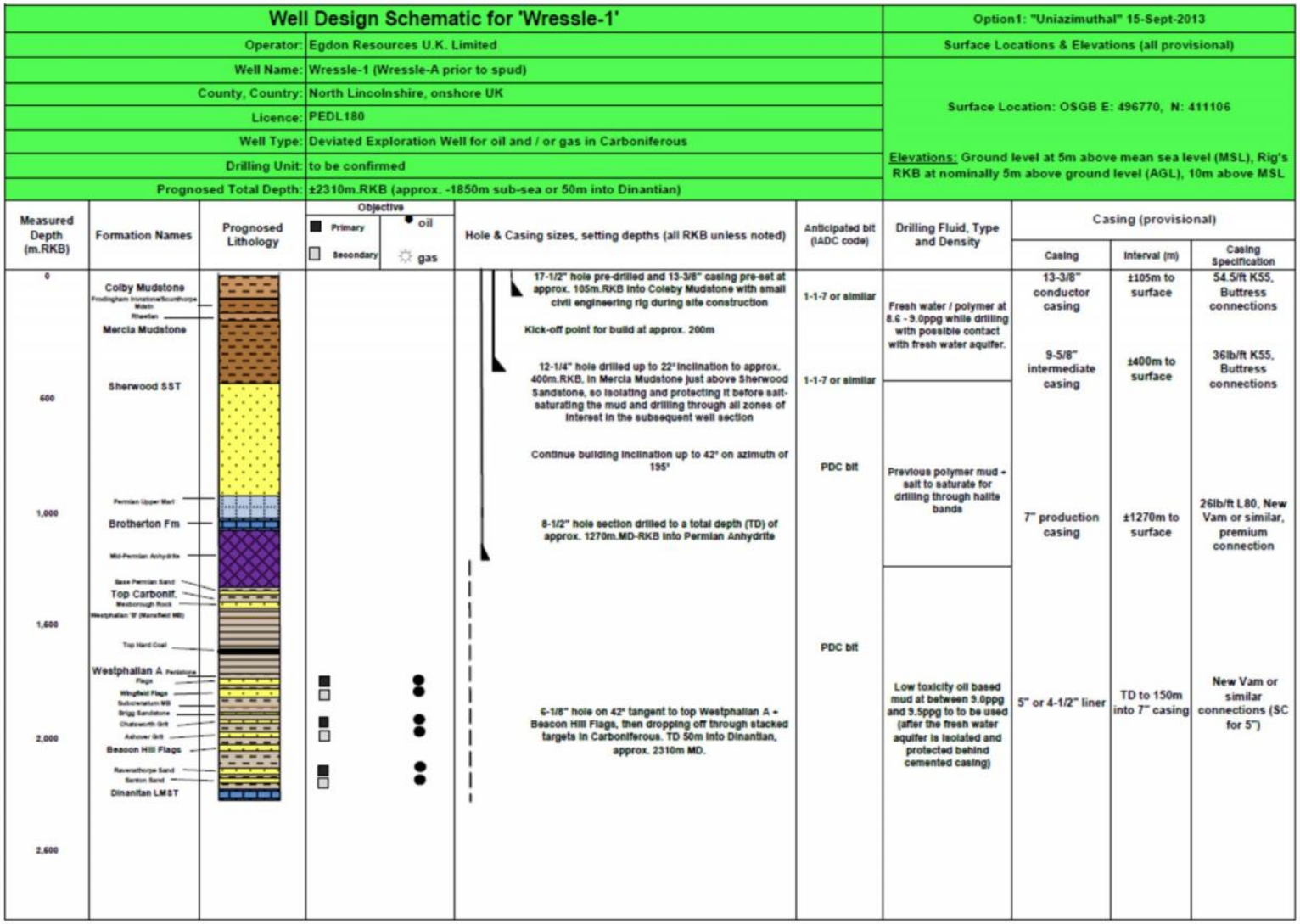

Figure 5.1: Wressle-1 Wellbore Schematic

5.3 Waste Generating Activities

A summary of the waste generating activities associated with hydrocarbon production from the Ashover Grit and other formations is detailed below. It should be noted that, with the exception of hydrocarbon production, the waste generating activities associated with short duration well operations, may or may not be undertaken one or more times throughout the life of the well, within the permitted scope of planning permission.

- Drilling of sidetrack well;
- Radial drilling operations;
- Near wellbore treatment operations of the Ashover Grit;
- Proppant squeeze of the Ashover Grit;
- Hot oiling (washing);
- Production operations; and
- Management of contaminated surface run-off water contained onsite.

Section 4.2.2 within this waste management plan, sets out the classification of waste streams associated with hydrocarbon production from the Ashover Grit formation and short duration well operations. Waste management arrangements for each waste stream are detailed within Section 5.3 of this Waste Management Plan.

5.3.1 Drilling of Wressle-1 Sidetrack Well

A small sidetrack drilling operation may be undertaken to further enhance oil flow from the Ashover Grit formation. This will entail mobilisation of a drilling rig to the site to drill from the existing wellbore, just above the Ashover Grit at around 2,000mMDRT to beyond the base of the reservoir at around 2,025mMDRT. The objective of the sidetrack would be to intersect the hydrocarbon bearing formation that may have formation damage present, and would be a short drilled length out of the existing casing of approximately 25m in length by a 3 ¾" diameter, extending out of the existing 4 ½" steel liner.

A conventional oilfield drilling rig will be mobilised to the wellsite, rigged up and commissioned. A whipstock will then be run and set in the well, immediately below the point of sidetrack at circa 2,000mMDRT. A milling assembly will then mill a hole in the existing casing providing access to the formation. A 3 ¾" (95mm) drilling assembly will then be run and will drill from circa 2,000mMDRT to 2,025mMDRT, the base of the hydrocarbon bearing formation, using an oil based drilling fluid system.

Once the sidetrack has been drilled, a 2 $^{7}/_{8}$" (73mm) liner or tailpipe will be run and secured into position.

The sidetrack drilling operation, including mobilisation and demobilisation from the wellsite is anticipated to take up to four weeks to complete.

5.3.2 Radial Drilling Operations

Egdon Resources may also undertake the drilling of two or more drain holes into the Ashover Grit formation using a technique known as radial drilling. The drain holes would be achieved by drilling out of the existing casing using high-velocity fluid jets through a rotating nozzle, creating small boreholes of up to 2" (51mm) diameter, each up to 100m in length within the hydrocarbon bearing formation. The drilling fluids used to radial drill the formation will be oil based, similar to those used to drill the sidetrack well.

The depth from which the radially jetted drain holes could be drilled from the existing borehole is approximately 2010mMDRT. The objective of the drain holes is to improve oil production efficiency by extended the reach and contact beyond the borehole. It involves the mobilisation of a small coiled tubing unit to site, a workover rig, a crane and ancillary equipment.

The indicative layout of the equipment for this operation is defined within ER-EPRA-W1-SP-004.

5.3.3 Near Wellbore Treatments

Egdon Resources may also undertake one or more near wellbore treatments within the Ashover Grit formation during the lifetime of hydrocarbon production from the well, the details of which are described below. The purpose of near wellbore treatments is to reinstate or improve the permeability of the formation, having potentially been blocked as a result of the initial drilling and completion operations.

All near wellbore treatments will be applied to the Ashover Grit and other formations at pressures and pump rates lower than those that would be required for fracture propagation into the formation. Initially, an injectivity test is first undertaken. This test is an engineering test, which will apply increased pressure to the formation until it reaches a point at which injectivity starts to occur. This, in turn, will determine the maximum pressure that can for a near-wellbore treatment. The applied pressure is controlled by the injection rate (I.e. the pump rate) which is typically very low, in the order of 1 barrel (159 litres) per minute.

The fluid used to undertake the injectivity test will typically be hydrochloric acid (HCl), at 10-15% concentration with water (i.e. 150kg of HCl with 850kg of water).

5.3.3.1 Acid Squeeze

To improve the flow of hydrocarbons within the Ashover Grit formation, an acid, most commonly hydrochloric acid (HCl) at 10-15% concentration with water (i.e. 150kg of HCl with 850kg of water) plus hydrofluoric acid generating formulation, may be applied to the formation through the existing perforations within the wellbore. The operation is very much akin to those used in the rehabilitation of public water supply and commercial water wells constructed within carbonate formations within the UK.

An acid squeeze is applying the acid to the formation at pressures and rates determined by the injectivity test, resulting in the acid being squeezed into the near wellbore formation matrix and increasing the near wellbore permeability.

This would involve small volumes circa 50m^3 of a dilute hydrochloric acid (HCl) and hydrofluoric acid (HF) generating formulation being injected, left to "soak" for a few hours and then flowed back through the production equipment for collection and subsequent disposal.

A preflush of 10m^3 10-15% HCl containing surface-tension reducing additives and corrosion inhibitor is pumped into the formation. This is then immediately followed by the main treatment of 20m^3 ammonium

biflouride, again with corrosion inhibitor, and is pushed into the formation past the damage zone using up to 20m^3 3-5% ammonium chloride solution containing typically 10% ethylene glycol monobutyle ether (EGMBE) and polyquarternary amine clay stabilizer.

The treatment may then be further displaced with a low toxicity based oil, which may replace some or all of the ammonium chloride.

The entire treatment is typically energised with nitrogen and following full displacement into the formation is then flowed back in a controlled manner, through standard production related equipment for collection and disposal.

The acid reacts with minerals within the formation, the chemical reaction produces a neutral solution if fully reacted i.e. neither alkali or acidic, though in practise the flow back fluid usually remains slightly acidic. The solution produced as part of the reaction with the formation will be flowed back and removed from the Wressle-1 well.

Deeper aquifers within the Jurassic, Triassic and Permian are not considered to be important receptors due to their depth and likely high salinity or mineralised groundwater quality.

Whilst the injection of acid and the displacement of acid using a low toxicity based oil is a 'groundwater activity', the quantity and concentration used within the deep saline water bearing formation is such that the activity is considered de minimis and can be excluded under Schedule 22 3 (3) of EPR 2010. The acid squeeze within the Ashover Grit does not, therefore, require a groundwater permit.

5.3.3.2 Hot Oil Wash

Crude oil generally contains dissolved waxes that can precipitate within the natural fractures of the formation, restricting the flow of hydrocarbons to the well. Paraffin is one such wax, primarily consisting of long chain, saturated hydrocarbons.

Hot oil washing is a process of removing the build-up of paraffin precipitates within the production tubing. Hot oil, previously produced from the formation, is pumped from storage tanks onsite, via a mobile hot oil pump, which heats the oil prior to circulating down the well. Hot oil is pumped down the tubing to immediately above the perforations and circulated back to surface, dissolving or dislodging paraffin precipitates. Paraffin precipitates dissolved or dislodged within the hot oil are diverted from the well at surface back to the onsite oil storage tanks where it is comingled with the produced oil. Produced oil is subsequently transferred to road tankers and removed from site by a licenced haulier to a permitted refinery for sale.

For clarity, no hot oil is pumped into the formation and no waste is generated, therefore, a groundwater activity permit is not required nor does the activity fall to be considered a mining waste activity.

5.3.3.3 Solvent Treatment

Similar to hot oiling, solvents treatment is a process of removing the build-up of paraffin precipitates within the near wellbore formation and production tubing. It is pumped down the well and squeezed into the formation. The solvent dissolves the paraffin precipitates, re-establishing the flow of hydrocarbons.

The spent treatment and the dissolved paraffin precipitates return to surface and diverted from the well at surface back to the onsite oil storage tanks where it is comingled with the produced oil. Produced oil is

subsequently transferred to road tankers and removed from site by a licenced haulier to a permitted refinery for sale.

For clarity, no solvent treatment is retained in the near wellbore formation.

Whilst the injection of solvent treatment is a 'groundwater activity', the quantity and concentration used within the deep saline water bearing formation and the recovery of all treatment fluids is such that the activity is considered de minimis and can be excluded under Schedule 22 3 (3) of EPR 2010. The use of solvent treatment within the Ashover Grit does not, therefore, require a groundwater permit.

5.3.3.4 Nitrogen

To aid the initial flow of hydrocarbons from the formation, nitrogen may be injected into the wellbore to displace wellbore fluids, reducing its hydrostatic weight. Nitrogen is classified as an inert waste and venting of such considered a closed loop system, insofar as nitrogen is extracted from the atmosphere and is vented back to atmosphere. No nitrogen would remain in the formation.

A summary of the near well bore treatments that may be required throughout the life of the well is summaries in Table 5.1 below.

Near Wellbore Treatment Table			
Treatment	**Description**	**Chemicals used**	**Waste**
Acid Squeeze	Acid is applied to the formation to aid the flow of hydrocarbons to the surface cleaning out the near wellbore formation removing debris and induced damage resulting from the initial drilling operation. An acid squeeze involves injecting the treatment and low pump rates and controlled pressure to treat the area in the vicinity of the casing perforations.	Hydrochloric Acid and Hydrofluoric Acid solution.	Spent acid is circulated out of the well. See Section 5.3
Hot Washing	Hot oil and/or hot water is applied to the formation with the aim to remove solid hydrocarbons such as paraffin's from the near wellbore formation.	Hot oil and/or hot water	See Section 5.3
Solvent Treatment	Solvent is applied to the formation in oil bearing formations to remove solid hydrocarbons near the wellbore. Solvents only dissolve with hydrocarbons and do not react with the formation.	Hydrocarbon based solvents	See Section 5.3
Nitrogen Lift	To aid the initial flow of hydrocarbon, nitrogen may be injected into the wellbore to displace wellbore fluids, reducing its hydrostatic weight. Nitrogen is classified as an inert waste and venting of such considered a closed loop system, insofar as nitrogen is extracted from the atmosphere and is vented back atmosphere.	Nitrogen	Nitrogen will flow to surface. See Section 5.3

Table 5.1: Near Wellbore Treatment Table

5.3.4 Proppant Squeeze

In order to increase the permeability within the Ashover Grit formation, it may be necessary to undertake a proppant squeeze, which is designed to create channels of communication through near wellbore formation, having potentially been blocked as a result of the initial drilling and completion operation.

A proppant squeeze involves a slurry of proppant (resin-coated ceramic) and gelled water being pumped through the perforations into the Ashover Grit formation at a pressure exceeding the fracture propagation pressure of the formation. Injecting pressure and pump rates high enough to propagate a fracture in the formation creates channels of communication through near wellbore formation damage. When the pressure

is released the proppant remains in situ propping open the small fractures, through which hydrocarbons can flow at enhanced rates. Unlike hydraulic fracturing, a proppant squeeze requires the use of only a small volume of proppant and carrier fluid as it seeks to only bypass the formation damage rather than specifically to enhance the natural permeability of the formation.

A pre-treatment injectivity test will first be undertaken using approximately 15m^3 – 25m^3 of gelled liquid. The purpose of the injectivity test is to determine the breakdown pressure, propagation pressure and carrier fluid leak-off rate, which in turn will inform the main proppant treatment.

The main proppant treatment will consist of approximately 20 to 30 tonnes of resin-coated ceramic beads and approximately 80m^3 to 120m^3 of gelled liquid. The fluid mix is injected at a surface pressure of 9,000psi for 1 to 2 hours, then flowed back through the production facilities in a controlled manner.

The proppant squeeze is designed to extend circa 40m in a lateral direction and 20m in a vertical direction, above and below the perforation, as indicated in Figure 5.3.

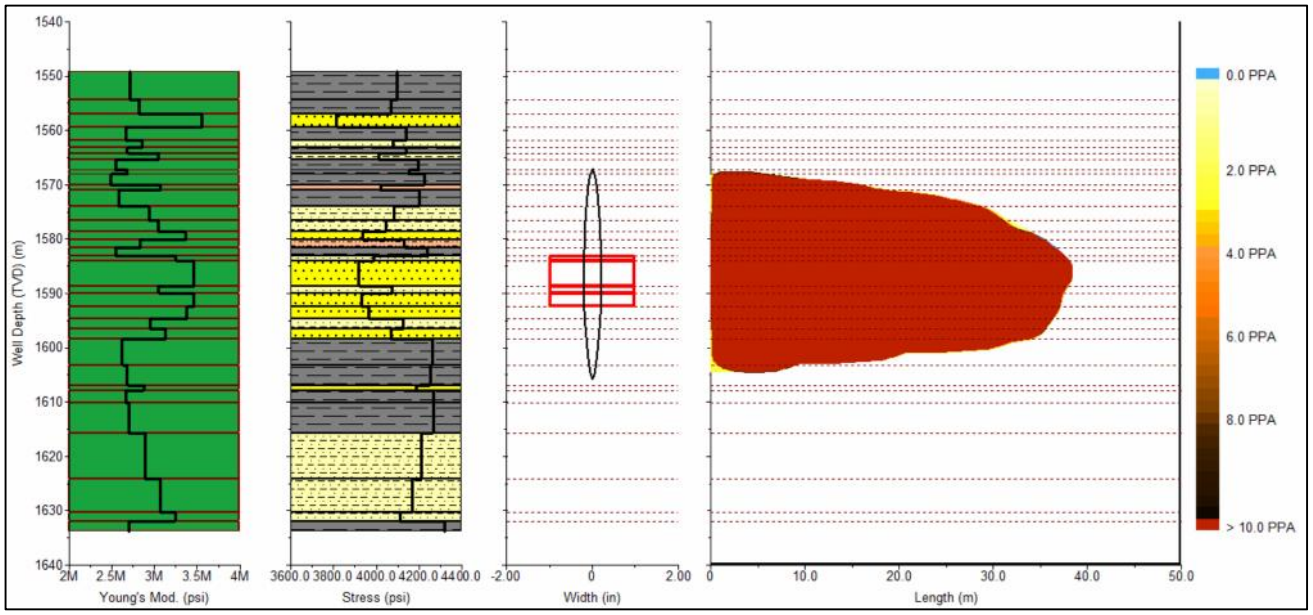

Figure 5.2: Proposed Proppant Propagation

This is a small scale operation which historically has taken place in Lincolnshire (e.g. nearby Crosby Warren well), where there are tight formations of sandstone reservoirs, or where there are formation damage issues preventing the full flow potential.

A full disclosure of the proposed proppant fluid, including a breakdown of each component is provided as Appendix 3 within this waste management plan.

5.3.4.1 Flowback Water and Disposal

A percentage of the proppant fluid will be returned to surface (flowback water) via the production facilities and stored onsite for subsequent offsite transfer to an Environment Agency approved waste treatment facility for disposal in accordance with the receiving waste treatment facility's environmental permits. The percentage returned is expected to be circa 30% with a maximum of 50%, based upon previous proppant squeeze operations undertaken by the industry.

Flowback water has the potential to contain low levels of Naturally Occurring Radioactive Material (NORM), which predominantly relate to the isotopes of radium (and associated progeny), which find their way into the water due to their chemical solubility. Elevated concentrations of radium-226 and radium-228 progeny may also be present due to dissolved Rn-222 (radon) and to a lesser extent, Rn-220 (thoron) gas. Samples of flowback water shall be sent to a laboratory holding the appropriate accreditations for radionuclide analysis.

A radioactive substances permit has previously been issued for the Wressle wellsite, covering the handling and storage NORM contained within formation water. Whilst the activities proposed during hydrocarbon production from the Ashover Grit formation will also generate radioactive waste, the activity limits set within the existing radioactive substances permit are deemed suitable.

5.3.4.2 Retained Fluid within the Formation

The remaining 50% to 70% of proppant fluid will be retained within the formation, having been adsorbed on the charged, high surface area minerals within the formation. The majority of the constituents within the proppant fluid are non-hazardous, having been assessed using the Joint Agencies Groundwater Directive Advisory Group (JAGDAG) assessment methodology. The assessment concluded that the majority of constituents assessed for use in the Wressle-1 proppant squeeze are classified as non-hazardous to groundwater. A copy of the JAGDAG substances assessment is provided within Appendix 3 of this Waste Management Plan.

Three (3)constituents have been classified as hazardous, however, due to the extremely low quantity and concentration expected to be used within the Ashover Grit formation, the use of such constituents is considered de-minimis in accordance with Schedule 22 3 (3) of EPR 2010, as the quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater.

The formation within which the fluid is retained is expected to be classified by the Environment Agency as a Non-Hazardous Mining Waste Facility, the extent of which will be determined through fracture height and growth modelling.

An indication of the aerial extent of the Non-Hazardous Mining Waste Facility for the proppant fluid is included within document ER-EPRA-W1-SP-004 and is based on the maximum anticipated fracture length. The base of the well is approximately 1,140m southwest of the surface location, which for clarity, is the top of the borehole within the Wressle wellsite.

As a result of the retention of proppant fluid with the Ashover Grit formation being classified as a Mining Waste Facility, there is a requirement, through assessment, to establish BAT for the management of the retained proppant fluid. The options considered as part of the BAT assessment include:

- Recovery of all proppant carrier fluid over prolonged flowback periods during hydrocarbon production;
- Increased recovery of proppant fluid using artificial lifting (submersible pumps);
- Recovery of proppant fluid by excavation; and
- Retention of proppant fluid within the formation.

The BAT assessment identified that both the prolonged flowback periods and artificial lift are unlikely to result in a 100% recovery of proppant fluid from the formation.

Recovery by excavation is not feasible due to the depth of formation within which the fluid is retained. Such methods of excavation would have a significant environmental impact. This would involve the development of a mineshaft considerably wider than the original Wressle-1 borehole to a depth of circa 1,576mTVD, sufficiently large enough to accommodate structural supports for safety against collapse and of entry of necessary personnel, machinery and supplies.

The development of a mine would create significant extractive waste, the volume of which would far exceed the volume of waste the development seeks to retrieve from the target formation. This option offers no environmental benefit and would cause significant local amenity impacts and disruption to the local community. Economically, the development of a mine would render the exploration and subsequent production of hydrocarbons from the Ashover Grit formation unviable.

As it is not feasible to retrieve 100% flowback, either by a prolonged flowback period or by artificial lift and the removal of proppant fluid by excavation is not feasible, retention within the formation is considered BAT. The alternative options are unrealistic and/or theoretical in nature. Injected proppant fluid, retained at depth, does not present a credible environmental risk.

Proppant retained within the formation prevents the fractures from closing and provides the permeability for hydrocarbons to flow. As the proppant fulfils a purpose, it is not considered a waste.

5.3.5 Hydrocarbon Production from Wressle-1 Well

Drilling of the Wressle-1 borehole was completed during third quarter 2014 followed by successful well testing operations during 2015. This waste management plan has been produced to consider the management of extracted waste from hydrocarbon production from the Ashover Grits formation and, near wellbore treatments and proppant squeeze, as may be required.

Hydrocarbon production has the potential to generate extractive waste in the form of formation water, spent wellbore treatment fluids and/or flowback water. Depending on the characteristics of the Wressle-1 well, a mixture of oil and natural gas will be produced with the associated extractive wastes. Depending on the volumes of natural gas encountered, should the volume be insufficient for power generation, it will be considered extractive waste and disposed of safely by way of an enclosed ground flare.

5.3.5.1 Oil Production

Produced fluids (oil, formation water, spent wellbore treatment fluids and/or flowback water) will either free flow to the surface naturally or with the aid of surface pump, artificially lifting fluids to surface. For clarity, a permit subject to the Mining Waste Directive covers the management of extracted waste and not the extraction process, therefore, the method by which oil, natural gas and associated fluids come to surface is not a material consideration of this waste management plan and associated environmental permits.

At surface, produced fluids and associated natural gas will be diverted by pipework to a bath heater (if water is present), preheating the fluid to aid in the three phase separation process, which will separate out oil, water (if present) and associated natural gas. Oil, which for clarity is not a waste, will be diverted via pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to a permitted refinery for sale.

Water, if present, will be diverted via pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to either Environment Agency permitted water reinjection facility for reinjection or an Environment Agency permitted water treatment facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility.

If natural gas is produced along with the oil, then gas will be managed in accordance with Section 5.3.5.2.

Water produced during hydrocarbon production has the potential to contain low levels of Naturally Occurring Radioactive Material (NORM). Samples of formation water will be sent to a laboratory holding the appropriate accreditations for radionuclide analysis by gamma spectrum. Depending on the outcome of radionuclides analysis, formation water will be transported via a licenced haulier to either an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility, or to a bespoke RSR permitted waste treatment facility for treatment and disposal in accordance with Best Available Technique (BAT). Egdon Resources is also considering alternate facilities, such as reinjection wells for the purpose of disposing water containing NORM. The disposal of formation water contaminated with NORM is subject to the correct environmental permits being in place by the receiving operator, whom the Environment Agency will regulate.

5.3.5.2 Associated Natural Gas

The primary objective of the Wressle-1 well is to produce oil from the Ashover Grit formation, however, previous well testing operations indicate that natural gas may be present.

Regardless of the quantity of natural gas present with the oil, an enclosed ground flare will be installed onsite as the method of safely disposing of natural gas, in the case of routine maintenance or an emergency, where the requirement to blowdown the gas within the surface production equipment exists, once the well is shut in.

During the initial stages of hydrocarbon production, natural gas will be disposed of safely via the enclosed ground flare located onsite. This will also aid in the establishment of flow rates and pressures, which in turn will inform the decision as to whether the natural gas is sufficient in quantity and flow rate to sustain electricity generation by way of a gas engine to power the site, with any remaining electricity being exported to the national grid, up to the capacity limit of the receiving electricity distribution system.

At this early stage in the development of the Wressle wellsite, it is difficult to predict the volumes, flow rates and longevity of associated natural gas production from the Wressle-1 well. Likewise, the cost and timescales associated with the installation of electricity generating equipment and connection to the national grid contribute to whether the use of associated natural gas, in accordance with Article 5 (2) of the Mining Waste Directive, is commercially viable.

The criteria for determining the management of associated natural gas production from the Wressle-1 well is detailed below.

Low Gas Volumes

Generally, the lower threshold limit for the combustion of natural gas via an enclosed ground flare is approximately 18,000scfd, which equates to approximately 750scf per hour. If the production of natural gas

is below this threshold limit, it may not be feasible to combust the natural gas without the introduction of support gas, such as propane.

Notwithstanding the lower threshold limit, natural gas production above 18,000scfd but below 50,000scfd is not likely to be sufficient to enable generation of electricity and export to the national grid. It may be possible, however, to generate small quantities of electricity via a gas engine and use locally by either heat or feed into the site distribution system, or "dump" the electrically generated load via a load bank.

If none of these options are technically or commercially feasible, the proposal would be to safely dispose of the natural gas via an enclosed flare, assuming the volumes are sufficient to maintain combustion.

Medium to high gas volumes

If volumes are sufficient and it is deemed commercially viable, natural gas will be used to generate electricity and export to the national grid.

It should be noted that a ground flare will still be required onsite if medium to high gas volumes are sustainable to either combust any residual gas that cannot be used (i.e. flow rates exceeds the maximum capacity of the gas engine and/or to act as a relief flare in the event of equipment or operational failure/malfunction).

If gas volumes are such that electricity generation is above the capacity of the export connection, it may be that a load bank is used to harness the additional natural gas rather than sending excess gas to the flare system.

5.3.6 Well Abandonment and Partial Well Abandonment

Upon cessation of hydrocarbon production, the well will be abandoned in accordance with Oil & Gas UK *Guidelines for the suspension and abandonment of wells*, which requires all distinct permeable zones penetrated by the well to be isolated from each other and from surface by a minimum of one permanent barrier. If any permeable zone penetrated by the well is hydrocarbon-bearing or over-pressured and water-bearing then the requirement is for two permanent barriers from surface, the second barrier being a back-up to the first.

In addition to the Oil & Gas UK *Guidelines for the suspension and abandonment of wells*, the well abandonment(s) will be undertaken in accordance with the following regulations:

- The Borehole Sites and Operations Regulations 1995, and
- Offshore Installations and Wells (Design & Construction, etc) Regulations 1996

The initial design and construction of the well takes into consideration the permeable zones encountered during the drilling operation and whether any of these zones are hydrocarbon-bearing or over-pressured and water-bearing. Construction of the borehole has provided adequate sealing of these zones when cementing in the various steel casing strings, ensuring compliance with the Oil & Gas UK guidance.

Based on a borehole construction, which complies with Oil & Gas UK guidance for the suspension and abandonment of wells, the internal section of last cemented casing string will be subject to well abandonment. The operation involves the setting of cement barriers, extended above and below the permeable zone(s). Retainers are positioned within the internal casing string immediately below the required cement depth, which prevents the cement from moving or slumping during setting.

Once the well is abandoned, the casing strings will be mechanically cut off at 1.5m below original ground level and a steel plate welded over the top. The pre-cast concrete drilling cellar would then be removed and the site restored to its former use.

5.4 Classification of Operations

A review of the proposed hydrocarbon production, near wellbore treatments and proppant squeeze operations against applicable environmental legislation has identified the following classifications as being applicable to the wellsite.

5.4.1 A Water Discharge Activity & Groundwater (Point Source) Activity

Schedule 21 of EPR 2010 relates to water discharge activities. Although Egdon Resources proposes to install a Class 1 Oil-Water Separator, an application to discharge clean surface run-off water (often referred to as roof water) will not be required, as the surface water being discharged will be clean. An additional safeguard will be to restrict the discharge of surface water during well intervention operations, where temporary equipment onsite increases the potential for a minor spill to occur,

Surface water collected within permanent bunds onsite will be collected and stored temporarily onsite for subsequent offsite treatment and disposal at an Environment Agency permitted waste treatment facility.

EPR 2010, which transposes the requirements of the Water Framework Directive 2000/60/EC, requires groundwater activities to be authorised. A groundwater activity is defined in Schedule 22 Paragraph 3 (1) (c) *any other discharge that might lead to the direct or indirect input of a pollutant to groundwater.*

Although the risk to groundwater is very low due to the way in which Egdon Resources has constructed the Wressle-1 borehole and that the majority of the proppant squeeze constituents are non-hazardous, the proppant squeeze is expected to be classified by the Environment Agency as a groundwater activity, namely, any other discharge that might lead to the direct or indirect input of pollutant to groundwater. Egdon Resources is, therefore, taking a precautionary approach and applying for a groundwater activity permit for the proppant squeeze operation.

The near wellbore treatments associated with hydrocarbon production operations fall within the definition of a Groundwater Activity under Schedule 22 of EPR 2010. However, Schedule 22 3 (3) of EPR 2010 provides that *'The regulator may determine that a discharge, or an activity that might lead to a discharge, is not a groundwater activity if the input of the pollutant…*

(b) is or would be of a quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater.

5.4.2 Mining Waste Operation and Mining Waste Facility

EPR 2010, which transposes the requirements of the Mining Waste Directive 2006/21/EC, requires mining waste operations to be authorised. A mining waste operation is defined in Schedule 20 paragraph 2 (1) of EPR 2010 as 'the management of extractive waste, whether or not involving, a mining waste facility.

For the purpose of this Waste Management Plan, hydrocarbon production, near wellbore treatments and proppant squeeze operations are classified as:

- A Non-Hazardous Mining Waste Operation for the management of extraction waste, whether or not involving a mining waste facility. Non-hazardous extractive waste will be produced during hydrocarbon production, near wellbore treatments and proppant squeeze operations. A permit subject to the mining waste directive covers the management of extracted waste and not the extraction process;
- A Non-Hazardous Mining Waste Facility for the accumulation of proppant carrier fluid which will not return to the surface and will remain within the formation being stimulated. A Waste Facility is defined as 'any area designated for the accumulation or deposit of extractive waste, whether in a solid or liquid state or in solution or suspension for the following time-periods';
    - A period of more than one year for facilities for non-hazardous non-inert waste;

5.4.3 Installations Activity

Industrial Emissions Directive 2010/75/EU lays down rules on integrated prevention of pollution arising from industrial activities, whilst also laying down rules designed to prevent or, where that is not practicable, to reduce the emissions to air, water, and land and to prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole.

Hydrocarbon production will not include the incineration of natural gas exceeding 10 tonnes per day and, therefore, a permit to authorise an installation operation of the incineration of natural gas will not be required.

Hydrocarbon production will involve the loading, unloading, handling and storage of crude oil on the wellsite and, as such, an installation permit under Part 2 Schedule 1.2 of EPR 2010 is required.

5.4.4 A Radioactive Substances Activity

Schedule 23 of EPR 2010 provides for the control of Naturally Occurring Radioactive Material (NORM). Schedule 23 defines the production of oil and gas as a NORM industrial activity and therefore any accumulation of radioactive waste, which exceeds concentrations set out in Table 1 of Schedule 23 of EPR 2010 and its subsequent disposal requires an environmental permit to authorise a radioactive substances activity.

Hydrocarbon production from the Ashover Grit formation, near wellbore treatments and proppant squeeze operations will involve the circulating and/or flowing to surface of fluids exposed to the formation during near wellbore treatments, proppant squeeze and/or production. These fluids may or may not contain NORM in concentrations exceeding those set out in Table 1 of schedule 23 or EPR 2010.

Egdon Resources has previously obtained a permit from the Environment Agency (EPR/HB3295DH/A001) for the storage and disposal of radioactive substance, during well testing operations. Whilst the activities proposed during hydrocarbon production from the Ashover Grit formation may also generate radioactive waste, the activity limits set within the existing radioactive substances permit are deemed suitable.

6. EXTRACTIVE AND NON-EXTRACTIVE WASTE MANAGEMENT

The following sections describe the various extractive and non-extractive wastes arising from hydrocarbon production, near wellbore treatments and proppant squeeze operations, their classification and anticipated quantities. This section also describes the objectives of Egdon Resources of appropriately managing wastes and how these objectives are achieved through waste minimisation, methods of treatment and disposal.

6.1 Operator Waste Objectives

Egdon Resources policy on waste Duty of Care, waste segregation, waste handling and waste transfer are set out within the Management System Summary HSE-MWP-WSL-012.

The Site Waste Manager for the Wressle wellsite is the Egdon Resources Wellsite Supervisor during periods of activity onsite, who reports to the Egdon Resources Production and HSE Manager. During periods of non-activity and where production activities are solely taking place onsite, the Egdon Resources Production and HSE Manager shall take the role of the Site Waste Manager, who will:

- Promote awareness of the Waste Management Plan;
- Monitor and report on waste generation;
- Monitor and enforce on waste segregation;
- Monitor the effectiveness of the Waste Management Plan;
- Form a good working relationship with the waste management contractor; and
- Encourage suggestions for better waste management onsite.

Article 5(2) of the Mining Waste Directive sets out the objective of the waste management plan.

(a) to prevent or reduce waste production and its harmfulness, in particular by considering:

(i) waste management in the design phase and in the choice of the method used for mineral extraction and treatment;

(ii) the changes that the extractive waste may undergo in relation to an increase in surface area and exposure to conditions above ground;

(iii) placing extractive waste back into the excavation void after extraction of the mineral, as far as is technically and economically feasible and environmentally sound in accordance with existing environmental standards at Community level and with the requirements of this Directive where relevant;

(iv) putting topsoil back in place after the closure of the waste facility or, if this is not practically feasible, reusing topsoil elsewhere;

(v) using less dangerous substances for the treatment of mineral resources;

(b) to encourage the recovery of extractive waste by means of recycling, reusing or reclaiming such waste, where this is environmentally sound in accordance with existing environmental standards at Community level and with the requirements of this Directive where relevant;

(c) to ensure short and long-term safe disposal of the extractive waste, in particular by considering, during the design phase, management during the operation and after-closure of a waste facility and by choosing a design which:

(i) requires minimal and, if possible, ultimately no monitoring, control and management of the closed waste facility;

(ii) prevents or at least minimises any long-term negative effects, for example attributable to migration of airborne or aquatic pollutants from the waste facility; and

(iii) ensures the long-term geotechnical stability of any dams or heaps rising above the pre-existing ground surface.

In accordance with Article 5(2)(a)(i) of the Mining Waste Directive, the management of waste was identified during the design phase of the hydrocarbon production, near wellbore treatments and proppant squeeze operations from the Ashover Grit formation.

Due to the proppant squeeze being a single activity (not repeated in short duration), the choice of method proposed for flowback water management will involves the offsite treatment and/or disposal at an Environment Agency permitted waste treatment facility.

With reference to Article 5(2)(a)(ii) of the Mining Waste Directive, extractive waste generated during the hydrocarbon production from the Ashover Grit formation does not undergo any changes in relation to surface area or exposure to conditions above ground. It is the intention that all extractive waste generated during the hydrocarbon production will be temporarily stored onsite for subsequent offsite treatment and/or disposal at an Environment Agency permitted waste treatment facility, including reinjection facilities.

Hydrocarbon production from the Ashover Grit formation does not generate extraction voids nor does current environmental legislation support the reinjection of flowback water from the proppant squeeze operation. Article 5(2)(a)(iii) of the Mining Waste Directive is, therefore, not applicable to the to the Wressle wellsite.

The Wressle wellsite is subject to a closure plan upon cessation of hydrocarbon production. The closure plan will set out the details for wellsite restoration, including the replacement of topsoil currently stored onsite. The reuse of topsoil after closure accords with Article 5(2)(a)(iv) of the Mining Waste Directive.

With reference to Article 5(2)(a)(v) of the Mining Waste Directive, the majority of the constituents within the proppant fluid are non-hazardous, having been assessed using the Joint Agencies Groundwater Directive Advisory Group (JAGDAG) assessment methodology. The assessment concluded that the majority of constituents assessed for use in the Wressle-1 proppant squeeze are classified as non-hazardous to groundwater. A copy of the JAGDAG substances assessment is provided within Appendix 3 of this Waste Management Plan. Three (3)constituents have been classified as hazardous, however, due to the extremely low quantity and concentration expected to be used within the Ashover Grit formation, the use of such constituents is considered de-minimis in accordance with Schedule 22 3 (3) of EPR 2010, as the quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater.

6.2 Waste Prevention and Minimisation

Egdon Resources and its specialist contractors follow Article 4 of the revised EU Waste Framework Directive which is transposed within UK law through the Waste (England and Wales) Regulations 2011.

6.2.1 Waste Prevention

Every effort will be made to eliminate the waste produced at source. Control measures will include:

- Avoiding packaged material where practicable;
- Ordering correct quantities;
- Avoiding damage by handling and storing correctly; and
- Using fewer materials in designs and manufacturing.

6.2.2 Preparing for Re-Use

Only dispose of waste which cannot economically or practically be re-used or recycled. Materials such as low toxicity oil based drilling fluids can be readily re-used. Checking, cleaning, repairing and refurbishing of items and spare parts for subsequent re-use.

6.2.3 Recycle

Waste is to be segregated onsite to allow for recycling offsite. Additionally, materials that are recycled shall be procured for use onsite where practicable and where specification permits. Turning wastes into a substance or product including composting subject to quality protocols.

6.2.4 Other Recovery

Other recovery includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste, some backfilling.

6.2.5 Dispose

Waste that cannot be reused or recycled practicably shall be disposed of responsibly and in compliance with Egdon Resource's duty of care obligations. All waste shall be removed from site by a licenced waste carrier to a licenced waste facility.

6.3 Waste Description and Management Arrangements

An assessment of the potential waste arising from hydrocarbon production, near wellbore treatments and proppant squeeze has been undertaken. The potential waste, together with its classification anticipated quantities, prevention, minimisation, treatment and disposal is provided in this section.

For clarity, a hot oil wash, as described in Section 5.3.3.2 does not generate waste and, therefore, is not included within the extractive waste tables below. Likewise, solvent treatments comingle with the produced hydrocarbons, which are stored onsite for subsequent offsite removal by a licenced haulier to a permitted refinery for sale. No treatment fluid is retained in the formation and therefore not included in the extractive waste tables below, as no waste is generated.

6.3.1 Extractive Waste

Well Suspension Brine		
Waste Classification, Quantity and Storage	**Classification**	Non Hazardous
	EWC Code	01 05 08
	Estimated Quantity	25m^3
	Onsite Storage	1 x 60m^3 Horizontal Cylindrical Closed Tank
	Storage Duration	Maximum 7 Days
	Odour Potential	No Odour Anticipated
Operation / Activity	The Wressle-1 well is the subject of a period of suspension using suspension brine and mechanical plugs. Following suspension, any further operations will require the suspension brine to be circulated out of the well to an onsite storage tank via surface pipework.	
Waste Prevention and Minimisation	The suspension brine will be stored onsite for subsequent reuse if required for the Wressle-1 well at a later date if the well will need to be suspended again.	
Waste Treatment and Disposal	Once the suspension fluid has fully served its purpose at the wellsite, the suspension brine will be removed from site via a licenced haulier to an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility.	
Waste Remaining in the Formation	None. Suspension brine is circulated out prior to production, formation testing and proppant squeeze operations.	
Monitoring	An inspection of the fluid tanks that contain the suspension fluid shall be carried out prior to being used and will be subject to regular visual inspections and annual thickness checks.	

Table 6.1: Well Suspension Brine

Sidetrack & Radial Drilling Operation: Oil Based Rock Cuttings		
Waste Classification, Quantity and Storage	**Classification**	Hazardous
	EWC Code	01 05 05
	Estimated Quantity	Sidetrack = 0.4m^3 Radial = 0.20m^3 per radial drill
	Onsite Storage	1 x 31m^3 Open Top Fluid Separator Tank (Drill Cuttings) and 1 x 20m^3 Open Top Tank (Centrifuge)
	Storage Duration	Maximum 7 Days
	Odour Potential	No Odour Anticipated
Operation / Activity	Drilling fluids are used in a closed loop system, within which the rock cuttings are circulated to surface and removed by vibrating screens (shakers) into an open top tank, which is also a fluid separator tank. Finer particles of rock cuttings are then extracted from the drilling mud by a centrifuge and the drilling mud is circulated back down the well.	
Waste Prevention and Minimisation	The ability to prevent or minimise rock cuttings recover is limited given that the formation needs to be removed to allow the casing to be installed. The selection of the drilling bit will be such that it minimises the hole size required to install each string of casing which, in turn, keeps the recovered volumes to a minimum. The rock cuttings tank is a fluid separator tank (perforated false floor), which allows drilling mud that coats the rock cuttings to percolate down through the false floor where it is collected and pumped back into the closed loop mud system.	
Waste Treatment and Disposal	Rock cuttings will be transferred from the rock cuttings tank to a sealed road bulker by a hydraulic grab arm fitted to the rock cuttings tank and transported offsite via licenced haulier to a permitted composting facility where it is blended into compost after compost has been sanitised.	
Waste Remaining in the Formation	None. Extractive process only.	
Monitoring	Egdon Resources provides a competent supervision to ensure the operation is carried out in accordance with an approved drilling programme. An inspection of the rock cuttings tanks shall be carried out prior to being used and will be subject to regular weekly inspections and annual thickness checks.	

Table 6.2: Oil Based Rock Cuttings

Sidetrack & Radial Drilling Operation: Oil Based Drilling Fluid		
Waste Classification, Quantity and Storage	**Classification**	Hazardous
	EWC Code	01 05 05
	Estimated Quantity	Sidetrack = 5m^3 Radial = 1m^3 per radial drill
	Onsite Storage	1 x 60m^3 Horizontal Cylindrical Closed Tank
	Storage Duration	Maximum 7 Days
	Odour Potential	No Odour Anticipated
Operation / Activity	Drilling fluids are used to aid in the drilling process by lubricating the drill bit, circulating to surface the rock cuttings from the drilling process and for well control by maintaining a prescribed hydrostatic pressure within the well to prevent the uncontrolled release of natural gas or formation pressure. Drilling fluids are used in a closed loop system, within which the rock cuttings are circulated to surface and removed by vibrating screens (shakers). Finer particles of rock cuttings are then extracted from the drilling mud by a centrifuge and the drilling mud is circulated back down the well.	
Waste Prevention and Minimisation	Drilling fluid waste is minimised by continually reusing the mud in a closed loop system and sustained by way of filtering out rock cuttings and finer particles of rock. The rock cuttings tank is a fluid separator tank (perforated false floor), which allows drilling fluid that coats the rock cuttings to percolate down through the false floor where it is collected and pumped back into the closed loop mud system. Whenever the low toxicity oil based drilling mud weight exceeds the prescribed mud weight, due to finer particles of rock cuttings in the mud, the drilling mud needs to be centrifuged, which is performed onsite.	
Waste Treatment and Disposal	Drilling fluids are used in a closed loop system onsite. Low toxicity oil based drilling fluids do not become a waste when no longer required for use in the operation, as they are returned to the supplier for reuse. A small volume of low toxicity oil based mud, contaminated with clean up fluid results from rig tank and equipment cleaning, which is transferred to a vacuum tanker for removal offsite via licenced haulier to a permitted disposal facility.	
Waste Remaining in the Formation	None. Any drilling fluids remaining within the formation exist as a filter cake on borehole wall and forms part of the well construction. It is not considered a waste.	
Monitoring	Egdon Resources provides competent supervision to ensure the operation is carried out in accordance with an approved drilling programme. An inspection of the mud tank system, including transfer lines, hoses etc. shall be carried out prior to being used and will be subject to regular visual inspections and annual thickness checks.	

Table 6.3: Oil Based Drilling Fluids

Cement (Plugging and Abandonment Cementation)		
Waste Classification, Quantity and Storage	**Classification**	Non Hazardous
	EWC Code	17 01 01
	Estimated Quantity	$5m^3$
	Onsite Storage	$6m^3$ Open Top Builder's Skip
	Storage Duration	Maximum 7 Days
	Odour Potential	No Odour Anticipated
Operation / Activity	On completion of hydrocarbon production from the well, it is plugged and abandoned as per Section 5.3.6.	
Waste Prevention and Minimisation	Careful planning will be taken prior to any cement operation being undertaking allowing Egdon Resources to calculate the amount of cement required thus preventing or minimising cement waste. The cement will be batched mixed to allow control of quantities being used, which further prevents and/or minimises cement waste. The cement operation will be undertaken by a competent contractor to reduce the amount of potential wastes produced from the returns to surface. The amount of waste cement expected is to be minimal.	
Waste Treatment and Disposal	Excess returns to surface will be transferred to a number of open top builders skips onsite for subsequent removal and disposal to an environmental agency permitted waste facility where it recycled as building rubble for use within the building industry.	
Waste Remaining in the Formation	None. Cement remaining within the formation, between the casing and formation (wellbore annulus) and within the casing is a critical component of the well construction and remains so throughout the life cycle of the well. It is not considered a waste.	
Monitoring	Egdon Resources provide competent supervision to review the cement calculations to prevent and / or minimise cement waste. The building skips will be inspected prior to use to ensure they are suitable for holding cement.	

Table 6.4: Cement

Near Wellbore Treatment – Spent Acid		
Waste Classification, Quantity and Storage	**Classification**	Non Hazardous
	EWC Code	16 10 02
	Estimated Quantity	50m^3
	Onsite Storage	1 x 60m^3 Closed Tank
	Storage Duration	Maximum 7 Days
	Odour Potential	No Odour Anticipated
Operation / Activity	Acid is used to remove production-resisting completion-induced formation matrix damage. As the acid reacts with minerals within the formation the chemical reaction produces a near neutral solution, generally mildly acidic. The solution produced as part of the reaction with the minerals will be lifted out of the wellbore into a closed tank and stored onsite for subsequent removal via a licenced haulier to an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility.	
Waste Prevention and Minimisation	The acid will be used in stages to ensure its use is minimised. The reaction of the acid with minerals produces. This reaction, and in turn the waste generated, is unavoidable. Careful planning will be taken prior to any acid squeeze being undertaking to ensure Egdon Resources minimises the amount of acid used, which in turn reduces the amount of waste generated by the operation.	
Waste Treatment and Disposal	The spent acid will be lifted out of the wellbore into a closed tank and stored onsite for subsequent removal via a licenced haulier to an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility.	
Waste Remaining in the Formation	None. The reaction of the acid with the minerals produces chlorides, which are classified as non-hazardous. The chloride solution will be lifted out of the formation and collected at surface.	
Monitoring	Egdon Resources provides competent supervisors to oversee the operation ensuring the correct volumes of acid are used. The horizontal cylindrical closed tank will be inspected prior to use to ensure they are suitable for holding calcium chloride.	

Table 6.5: Spent Acid

Nitrogen		
Waste Classification, Quantity and Storage	**Classification**	Inert
	EWC Code	Not Applicable
	Estimated Quantity	Not Known at this Time
	Onsite Storage	None – Comingled with the Natural Gas
	Storage Duration	Not Applicable
	Odour Potential	No Odour Anticipated
Operation / Activity	Nitrogen is injected into the well to aid the initial lifting of wellbore fluids, thus reducing the hydrostatic pressure and allowing hydrocarbons to flow to surface.	
Waste Prevention and Minimisation	The use of nitrogen can be classified as a closed loop system, having first been extracted from the atmosphere during its manufacturing process and subsequently released to atmosphere. The quantities of nitrogen required are small and a detailed measurement cannot be provided at this stage.	
Waste Treatment and Disposal	As an inert gas, nitrogen that has been extracted from the atmosphere will be comingled with any natural gas that flows to surface, where it will be combusted. Unburnt nitrogen will be released to atmosphere during the natural gas combustion process.	
Waste Remaining in the Formation	None. Nitrogen injected into the well to aid the initial lifting of wellbore fluids will flow to surface.	
Monitoring	The volumes of nitrogen will be monitored both in and out of the well.	

Table 6.6: Nitrogen

Proppant Carrier Fluid (Retained in Formation)		
Waste Classification, Quantity and Storage	**Classification**	Non Hazardous
	EWC Code	16 10 02
	Estimated Quantity	180m^3
	Onsite Storage	Not Applicable
	Storage Duration	Indefinitely
	Odour Potential	Not Applicable
Operation / Activity	Egdon Resources would like to retain the option to undertake a proppant squeeze if required. The technique is used to undertake low volume hydraulic fracturing of the formation and prop open the fractures using proppant. This in turn provides permeability, allowing natural gas and oil from within the formation to flow up into the wellbore and up to surface.	
Waste Prevention and Minimisation	Due to the nature of the Ashover Grit formation, it is anticipated that up 50% of proppant fluid will return to surface. The remaining fluid will be retained within the Ashover Grit formation and, as such, is classified as a Non-Hazardous Mining Waste Facility.	
Waste Treatment and Disposal	Not Applicable.	
Waste Remaining in the Formation	No less than 50% of the proppant fluid will be retained within the Ashover Grit formation.	
Monitoring	Fracture growth will be determined through micro seismic monitoring, providing evidence of the height and distance.	

Table 6.7: Proppant Carrier Fluid (Retained)

Proppant Carrier Fluid (Flowback Water)		
Waste Classification, Quantity and Storage	**Classification**	Non Hazardous
	EWC Code	16 10 02
	Estimated Quantity	180m^3
	Onsite Storage	1 x Silo
	Storage Duration	Maximum 28 Days
	Odour Potential	No Odour Anticipated
Operation / Activity	Egdon Resources would like to retain the option to undertake a proppant squeeze if required. The technique is used to undertake low volume hydraulic fracturing of the formation and prop open the fractures using proppant. This in turn provides permeability, allowing natural gas and oil from within the formation to flow up into the wellbore and up to surface.	
Waste Prevention and Minimisation	Due to the nature of the Ashover Grit formation, it is anticipated that up 50% of proppant fluid will return to surface.	
Waste Treatment and Disposal	Depending on the outcome of radionuclides analysis, flowback water will be transported via a licenced haulier to either an Environment Agency permitted waste water treatment works facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility, or to a bespoke RSR permitted waste treatment facility for treatment and disposal in accordance with the Best Available Technique (BAT).	
Waste Remaining in the Formation	Not Applicable.	
Monitoring	A contamination monitoring programme will be devised and will include the wellhead, separator equipment and storage tanks. Any consignment of formation water will be screened externally for contamination prior to leaving site. An inspection of the fluid tanks that contain the formation water shall be carried out prior to being used and will be subject to visual regular inspections and annual thickness checks.	

Table 6.8: Proppant fluid (Flowback Water)

Proppant		
Waste Classification, Quantity and Storage	**Classification**	Non Hazardous
	EWC Code	01 04 09
	Estimated Quantity	30 Tonnes
	Onsite Storage	15 x 70m^3 Horizontal Closed Tank
	Storage Duration	Maximum 28 Days
	Odour Potential	No Odour Anticipated
Operation / Activity	Flowback water will contain proppant (resin-coated ceramic) which is removed at surface.	
Waste Prevention and Minimisation	The quantity of proppant used is determined by the required composition of the proppant fluid. Proppant retained within the formation is not classified as a waste as it serves the purpose of 'propping' fractures within the formation.	
Waste Treatment and Disposal	The proppant will be transported offsite via licenced haulier to an Environment Agency permitted composting facility, where it is blended into compost after compost has been sanitised.	
Waste Remaining in the Formation	Not Applicable.	
Monitoring	Tanks will be inspected prior to use to ensure they are suitable for holding proppant and subject to visual regular inspections and annual thickness checks. Visual inspection to ensure no over loading occurs.	

Table 6.9: Proppant

Natural Gas		
Waste Classification, Quantity and Storage	**Classification**	Hazardous
	EWC Code	Not Applicable
	Estimated Quantity	<14,000m^3 per day
	Onsite Storage	None – Incineration by Ground Flare
	Storage Duration	Not Applicable
	Odour Potential	No Odour Anticipated
Operation / Activity	During production operations there is a likelihood of natural gas being produced from the formation and flowed at different rates to determine the characteristics of the formation, allowing Egdon Resources to determine whether or not the reservoir is capable of producing commercial quantities of natural gas.	
Waste Prevention and Minimisation	The ability to prevent or minimise natural gas is extremely limited during this operation as it is required to allow Egdon Resources to determine the condition and state of the reservoir. Given that the operation involves production, consideration has been given to the longer term, where there are a number of options in terms of management of associated or produced gas, which depend on the volumes of gas, the cost and timescale options if volumes are significant, and longevity (i.e. for how long gas would last).	
Waste Treatment and Disposal	Natural gas is separated from produced fluids at surface and diverted via pipework to a ground flare located onsite for incineration. The ground flare will be fitted with a pilot and an electrical ignition system. The flare will also be continuously propane fed to allow for a continuous flame. If natural gas is produced at commercially viable quantities incineration of natural gas will only occur as a safety precaution or if residual gas is present which cannot be used.	
Waste Remaining in the Formation	None. Natural gas naturally occurs within certain hydrocarbon bearing formations and is only considered as a waste when produced from the well.	
Monitoring	During flaring operations the flare will be managed through onsite supervision and interlinked safety and performance systems (e.g. pressure/flow safety ESD valves, combustion temperature) to ensure its effectiveness and efficiency.	

Table 6.10: Natural Gas

6.3.2 Non-Extractive Waste

During hydrocarbon production, near wellbore treatments and proppant squeeze, there may be non-extractive wastes generated onsite, including:

- Surface run-off water;
- Waste water and sewage;
- Waste engine, gear and lubricating oils;
- Waste hydraulic oils;
- Oil rags and absorbents;
- Waste oil filters;
- Paper and cardboard;
- Canteen waste;
- Wood; and
- Metal.

For clarity, the proposed development does not require nor does it propose the installation of a permanent connection to the existing sewerage. During hydrocarbon production a welfare unit is provided onsite, which has its own independent under-unit sewage tank. During short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, when a number of personnel will be onsite will be at its greatest, temporary welfare facilities will be provided onsite, each facility having an independent under-unit sewage tank.

Sewage will be collected periodically throughout the periods when the wellsite is manned and removed by licenced waste carrier to an Environment Agency permitted waste water treatment works for subsequent treatment and/or disposal. The criteria for determining whether waste will be recycled or disposed of will be determined by the receiving waste treatment facility upon receipt of the waste at the treatment facility. The waste will be tested by the waste treatment facility, the results of which will determine the treatment and/or disposal method to be used. Such treatment and/or disposal method will be in accordance with the waste treatment facility's environmental permits.

There will be no treatment or disposal of non-extractive waste onsite and any storage will be limited to temporary storage, pending collection. No temporary storage of non-extractive waste will exceed 12 months.

6.3.3 Waste Supervision and Carriers

The Egdon Resources HSE and Production Manager will undertake the management of waste generated at the wellsite during hydrocarbon production. During the short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, the management of waste generated at the wellsite will be delegated to the Wellsite Supervisor, appointed by Egdon Resources to exercise overall control of the wellsite operations, in accordance with the Borehole Sites and Operations Regulations 1995 and the Waste (England and Wales) Regulations 2011.

The management of waste onsite will include:

- Management of waste in accordance with the waste hierarchy, as set out in the Waste (England and Wales) Regulations 2011;

- Monitoring of all waste storage units such as skips and storage tanks;
- Liaison with third party waste advisors with respect to sampling and analysis of waste;
- Compiling all waste transfer notes; and
- Managing the collection and offsite disposal of all waste streams.

Egdon Resources will appoint competent waste dealers and carriers, responsible for the transportation of all waste streams to the relevant Environment Agency permitted waste treatment facility. Waste dealers and carriers will hold relevant certificates issued by the Environment Agency, which shall be inspected prior to being appointed.

6.3.4 Wellsite Supervisor

The Egdon Resources HSE and Production Manager is responsible for the day to day supervision of the Wressle wellsite during hydrocarbon production. When production has stabilised, the wellsite will be manned during daytime hours only, with a nominated production supervisor onsite. The Egdon Resources HSE and Production Manager will be responsible for the Health and Safety of personnel, contractors and public and the implementation of any identified environmental requirements to ensure that operations do not have an adverse impact on the environment during hydrocarbon production, including waste management.

During the short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, the supervision of the Wressle wellsite will be delegated to the Wellsite Supervisor, appointed by Egdon Resources to exercise overall control of the wellsite operations, in accordance with the Borehole Sites and Operations Regulations 1995 and the Waste (England and Wales) Regulations 2011.

The Wellsite Supervisor will be responsible for the Health and Safety of personnel, contractors and public and the implementation of any identified environmental requirements to ensure that operations do not have an adverse impact on the environment during the short duration well operations, including waste management. The onsite waste broker will report to the wellsite supervisor and provide advice where necessary to ensure that the management of waste has been undertaken in compliance with legislation and the waste hierarchy.

All Wellsite Supervisors will hold the relevant certificates and will be sufficiently experienced in accordance with the Egdon Resources Safety and Environmental Management System. The appointed Wellsite Supervisor will have:

- Minimum 5+ years' experience in wellsite supervision and in oil and gas drilling and production technologies;
- Current IWCF certification;
- Experience of well engineering, operation standards and applicable industry best practices;
- Experience in emergency response procedures;
- Understanding and application of applicable legislation, including but not limited to, the Offshore Installation and Wells (Design and Construction etc) Regulations 1996, Borehole Sites and Operations Regulation 1995 and be aligned with any revisions therewith.

7. ENVIRONMENTAL RISK ASSESSMENT

An Environmental Risk Assessment has been carried out in support of the permit variation and is based upon the Environment Agency guidance provided on the www.gov.uk website.

The environmental risk assessment follows the following structure:

- Identify the risk from the activity;
- Assess risks and check they are acceptable;
- Justify appropriate measures to control the risk (if needed); and
- Present the risk assessment.

A copy of the environmental risk assessment, together with a supporting statement and conceptual model, is included within 'Wressle-1 Environmental Risk Assessment' (ER-EPRA-W1-ERA-007) provided in support of the environmental permit variation.

8. MEASURES TO MINIMISE ENVIRONMENTAL IMPACT

Measures to minimise the environmental impact of hydrocarbon production, near wellbore treatments and proppant squeeze have been incorporated as part of the initial site selection process, site design and construction. The measures to mitigate long term environmental impact are:

- Site located suitable distance from residential properties;
- Site located away from any statutory designated areas;
- Hydrogeological risk assessment;
- Site design to include impermeable membrane and containment ditches;
- Wellbore lifecycle design to protect groundwater;
- Hierarchy of waste management;
- Operating procedures and inductions;
- Waste handling, storage and disposal regime;
- Continuous training and development;
- Environmental monitoring; and
- Restoration and aftercare.

9. CONTROL AND MONITORING OF WASTE

The environmental risk assessment has identified the requirement to control and monitor waste generated from hydrocarbon production, near wellbore treatments and proppant squeeze. A brief description of the control and monitoring of waste is provided below.

9.1 Releases to Groundwater

The potential for a release to groundwater exists both at surface and within the subsurface and have been assessed by way of a Hydrogeological Risk Assessment, which is included within the Site Condition Report (ER-EPRA-W1-SCR-006), submitted together with this Waste Management Plan in support of the Wressle-1 permit variation application.

9.1.1 Surface Release

Incorporated into the design of the Wressle wellsite is an impermeable membrane constructed using a Bentomat clay membrane which is a self-sealing product. The impermeable membrane prevents surface fluids (mainly rainwater) from penetrating the underlying subsoils. Surface fluids migrate along the surface of the impermeable membrane to a perimeter ditch, where it is contained.

Prior to installation, the existing containment ditch will be assessed to ensure it retains integrity, if it is evident that the performance of the Bentomat impermeable membrane has been compromised, remedial work will be undertaken to reinstate integrity prior to operations commencing onsite.

Ordinarily, surface fluids contained with the perimeter ditch is simply surface run-off water (often referred to as roof water), which subject to being determined as clean, will be discharged to surface water via a Class 1 Oil-Water Separator to Ella Beck, which is located immediately north of the wellsite. An additional safeguard will be to restrict the discharge of surface water during short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, where temporary equipment onsite increases the potential for a

minor spill to occur. During short duration well operation, surface run-off water will be contained onsite for subsequent offsite treatment and disposal at an Environment Agency permitting waste treatment facility.

Surface water collected within the permanent containment bund and permanent tanker loading area within the wellsite will be collected and stored temporarily onsite for subsequent offsite treatment and disposal at an Environment Agency permitted waste treatment facility. The containment bunds will be fitted with automated sump pumps, which will transfer the water to holding tanks.

Periodic inspections of the permanent containment bund, permanent tanker loading area storage tanks will be undertaken by the Egdon Resources HSE and Production Manager. The inspections will aid early identification of any potential release to site from equipment which deteriorates over time.

During short duration well operations, daily inspections of the drainage ditch and any other temporary bunds are undertaken by the Egdon Resources Wellsite Supervisor to ensure the level does not exceed the maximum containment. If the level is close to reaching the maximum containment, the surface fluids will be transferred to road tanker for subsequent offsite treatment and disposal at an Environment Agency permitted waste treatment facility.

A daily inspection of all temporary tanks and other temporary waste storage containers will be undertaken to ensure they remain fit for purpose. The inspections will aid early identification of any potential release to site from equipment which deteriorates over time.

9.1.2 Subsurface Release

Subsurface releases are mitigated by adopting the best practice approach to wellsite construction, hydrocarbon production and short duration well operations, including near wellbore treatments and proppant squeeze operations.

9.1.3 Groundwater Quality Monitoring

Included within the Hydrogeological Risk Assessment is an outline scheme of groundwater quality monitoring. The outline scheme of monitoring has been prepared in support of the Wressle-1 permit variation application and, once implemented, will demonstrate the effectiveness of mitigation measures.

The outline scheme of monitoring provides for the drilling of four (4) monitoring boreholes, three (3) shallow boreholes up to depth of approximately 5m to target the shallow water systems and one (1) deeper borehole to a depth of up to 50m to target the Lincolnshire Limestone formation. A baseline groundwater characterisation will be established prior to hydrocarbon production, against which any changes in chemical and physical attributes during hydrocarbon production, near wellbore treatments and proppant squeeze can be measured.

9.2 Releases to Air

Air quality monitoring has been established for the Wressle wellsite, which is described in detail within the Wressle Site Condition Report (ER-EPRA-W1-SCR-006).

A scheme of air quality monitoring may be undertaken during the initial phase of hydrocarbon production to monitor compliance with Air Quality Objectives (AQO) or relevant Limit Values, as may be set by the Environment Agency. Results of the air quality monitoring scheme will be made available for inspection by the

Environment Agency and will form part of the scheduled emissions submission as part of the environmental permit.

All storage tanks onsite require the ability to vent, in order to allow the displacement and replacement of air as the tanks are filled and offloaded respectively. The storage tanks onsite will be connected via a vent line manifold to a single release point located within the north east corner of the active area of the wellsite.

9.4 Wellsite Monitoring

The Egdon Resources HSE and Production Manager is responsible for the day to day monitoring of the Wressle wellsite during hydrocarbon production. When production has stabilised, the wellsite will be manned during daytime hours only, with a nominated Production Supervisor onsite. The Egdon Resources HSE and Production Manager will identify potential leaks and emissions from permanent site equipment and materials stored within the site and ensure that any action required to remediate such leaks or emissions is undertaken as soon as they are identified, thus preventing potential impact on the environment.

During the short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, the supervision of the Wressle wellsite will be delegated to the Wellsite Supervisor, appointed by Egdon Resources to exercise overall control of the wellsite operations, in accordance with the Borehole Sites and Operations Regulations 1995 and the Waste (England and Wales) Regulations 2011.

The Wellsite Supervisor will be responsible for monitoring the wellsite and temporary well operations equipment and will identify potential leaks and emissions from such temporary equipment and temporary materials stored within the site and ensure that any action required to remediate such leaks or emissions is undertaken as soon as they are identified, thus preventing potential impact on the environment.

During sort duration well operations, a written record of monitoring (Environmental Checklist) will be completed as part of the monitoring schedule by the Wellsite Supervisor. Copies of the Environmental Checklist will be held onsite and will be made available for review by the Environment Agency.

9.5 Contractor Performance

Egdon Resources is ultimately responsible for any waste generated onsite during the hydrocarbon production, and short duration well operations. Egdon Resources will not delegate its responsibilities or accountabilities as Operator to a contractor.

Contractors, who are involved in the generating of waste and subsequent reuse, recycle or disposal will first have been selected in accordance with the Egdon Resources Safety and Environmental Management System.

9.6 Security

Security of the wellsite is provided in the form of a 2m high 138.5m by 80.5m security fence and lockable access gates. The positioning of, both permanent and temporary equipment, including the groundwater quality monitoring boreholes, will be within the confines of the security fence.

The wellsite will be fitted with an intruder alarm system. CCTV system may also be installed.

During short duration well operations it may be necessary to have manned security. Manned security will control access and egress to the wellsite and will play a key role in the control of personnel in the event of an

emergency situation, in accordance with the Site Safety Document, a requirement of the Borehole Sites and Operations Regulations 1995.

9.7 Complaints

In the event that a complaint is received from stakeholders, including neighbours, the complaint shall be recorded and investigated in accordance with the Egdon Resources Safety and Environmental Management System *Incident Management Procedure*.

Complaints relating to the environment will be reported to the Environment Agency within the required timescales, as determined by the severity and environmental impact of the incident initiating the complaint and/or permit conditions. In some cases, permit conditions may require notification the Environment Agency within 24 hours or without delay for a potentially polluting incident.

Following notification, measures to prevent reoccurrence will be agreed with the Environment Agency, together with a programme for implementation. Implementation of the actions will be monitored and the Environment Agency informed.

10. ENVIRONMENTAL INCIDENT MANAGEMENT

The potential for an environmental incident to occur during the hydrocarbon production and short duration well operations is minimal. The source of such incident is contained within the wellbore and contained within the wellsite.

10.1 Containment within the Wellbore

Pressure control equipment is deployed on the well in accordance with the relevant American Petroleum Institute (API) Recommended Practices (RP) and/or applicable British Standard (BS).

During short duration well operations, well control equipment and/or pressure control equipment will be deployed on the well in accordance with the relevant American Petroleum Institute (API) Recommended Practices (RP) and/or applicable British Standard (BS).

Well control equipment and/or pressure control equipment is subject to a schedule of certification and testing, together with a requirement for those operating well control equipment to be certified competent.

10.2 Wellsite Containment

Incorporated into the design of the Wressle wellsite is an impermeable membrane constructed using a Bentomat clay membrane which is a self-sealing product. The impermeable membrane prevents surface fluids (mainly rainwater) from penetrating the underlying subsoils. Surface fluids migrate along the surface of the impermeable membrane to a perimeter ditch, where it is contained.

Ordinarily, surface fluids contained with the perimeter ditch is simply surface run-off water (often referred to as roof water), which subject to being determined as clean, will be discharged to surface water via a Class 1 Oil-Water Separator to Ella Beck, which is located immediately north of the wellsite. An additional safeguard will be to restrict the discharge of surface water during short duration well operations, such as sidetrack drilling, radial drilling and proppant squeeze, where temporary equipment onsite increases the potential for a

minor spill to occur. During short duration well operations, surface run-off water will be contained onsite for subsequent offsite treatment and disposal at an Environment Agency permitted waste treatment facility.

Surface water collected within the permanent containment bund and permanent tanker loading area within the wellsite will be collected and stored temporarily onsite for subsequent offsite treatment and disposal at an Environment Agency permitted waste treatment facility. The containment bunds will be fitted with automated sump pumps, which will transfer the water to holding tanks.

In addition, general spill containment and clean up equipment is provided onsite. In the very unlikely event of an environmental incident occurring beyond the capabilities of the equipment or personnel onsite then a specialist contractor, for example Veolia Environmental Services, will be called to assist Egdon Resources in dealing with the incident.

10.3 Fire Response

Whilst a fire is associated more so with the health and safety of the personnel onsite, a fire does have the potential to lead to an environmental incident. It is imperative, therefore, that any potential for a fire and subsequent emergency response is identified and included in the operational planning. The Site Safety Document, which is a requirement under Regulation 7 of the Boreholes Sites and Operations Regulations 1995, specifies the arrangements for identification and mitigation in the event of a fire, including consultation with the local Fire & Rescue Service.

Containment of any firefighting fluid is provided by the impermeable membrane incorporated in to the design of the wellsite. In the event that such requirements were to be necessary, continued monitoring of the containment ditch shall be implemented to ensure it does not exceed its containment capacity.

Additional water is available onsite and should be used to keep the areas adjacent to the fire cool to avoid any damage being sustained to the impermeable membrane.

10.4 Incident Reporting and Investigation

All incidents, no matter how minor, are reported in accordance with the Egdon Resources Safety and Environmental Management System *Incident Management Procedure*. The procedures therein provide for the investigation of all incidents to ensure lessons are captured and actions implemented to avoid reoccurrence.

In addition, the procedure provides for the notification to the relevant Regulatory Authority in the event of an incident which extends beyond the containment of the wellsite.

Environmental incidents will be reported to the Environment Agency within the required timescales, as determined by the severity and environmental impact of the incident and/or permit conditions. In some cases, permit conditions may require notification to the Environment Agency within 24 hours or without delay for a potentially polluting incident.

Following notification, measures to prevent reoccurrence will be agreed with the Environment Agency, together with a programme for implementation. Implementation of the actions will be monitored and the Environment Agency informed.

11. ALTERATIONS TO THE PLAN

Any required changes or deviations from this waste management plan are to be referred to the Egdon Resources HSE and Production Manager or, during short duration well operations, to the Egdon Resources Wellsite Supervisor in the first instance. No changes to or deviations from this waste management plan are to be implemented until the required changes or deviations have been reviewed and approved by Egdon Resources and the relevant approvals obtained in writing from the Environment Agency for any changes to the plans and operating techniques approved under the environmental permits to be issued.

Within the environmental permits there will be a requirement for the operator, Egdon Resources, to review the waste management plan every five (5) years and amend where necessary. The review date shall take place five (5) years from the date of permit issue. Reviews and amendments will also be required in the event of a substantial change(s) to the operations taking place onsite.

In some cases, changes to operations may require the environmental permit to be varied in order to accommodate such changes. In this instance an application will be made to the Environment Agency to vary the existing permit or apply for a new permit.

12. PLAN FOR CLOSURE

Upon cessation of hydrocarbon production, the well will be abandoned in accordance with Oil & Gas UK *Guidelines for the suspension and abandonment of wells*, and the wellsite restored to its former use.

In such an event, a closure plan will be created in accordance with section 3.4 of the Environment Agency's guidance "How to comply with your environmental permit, additional guidance for: mining waste operations" as part of any application to surrender the environmental permit. Wellsite restoration will be the subject of a separate waste management plan.

Other regulations relevant to the closure plan include:

- The Borehole Sites and Operations Regulations 1995;
- Offshore Installations and Wells (Design & Construction, etc) Regulations 1996; and
- Petroleum Act 1998 (Petroleum Exploration and Development Licence).

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APPENDIX 1 – CORPORATE INFORMATION

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EGDON RESOURCES CORPORATE INFORMATION

Registered Office:

Egdon Resources UK Limited
The Wheat House
98 High Street,
Odiham,
Hampshire,
RG29 1LP

Company Registration No: 03424561

Web: http: www.egdon-resources.com
Email:info@egdon-resources.com
Tel: 01256 702292
Fax: 01256 702293

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APPENDIX 2 – MANAGEMENT SYSTEM SUMMARY

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Document:	**Management System Summary**
Document Number:	**HSE-MWP-WSL-012**

Management System Summary

Wressle Drilling Operation

Contents

1. Introduction 9
2. Environmental Policy 9
3. Egdon's Environmental Management System:- Overview 11
4. Specific Document Framework for Mining Waste Activities 12
5. Summary 13
6. Definitions 13
7. Resources Required 13
8. Safety 14
9. Roles and Responsibilities 14
10. Additional Requirements 16
11. Procedure 16
12. Emergencies 17
13. References 18
14. Appendicies 18

Document:	**Management System Summary**
Document Number:	**HSE-MWP-WSL-012**

1. Introduction

The purpose of this document is to define, and provide a summary of, Egdon's management arrangements and system that will be in place for the Wressle drilling operation, to ensure compliance with the site Mining Waste Permit and environmental aspects of the site operations

The well will be directionally drilled from a surface location in licence PEDL182 to the Wressle prospect which is in licence PEDL180. Egdon Resources U.K. Limited is the Operator for PED180 and will be the Operator for the drilling, completion and production of this well (reference to BSOR No.4)

2. Environmental Policy

Egdons Health, Safety and Environmental Policy sets out the company's commitment to ensuring that environmental issues are considered at the highest level, and resources are applied to ensure that Egdon sites operate to high standards of environmental performance:- identifying and mitigating environmental risks, preventing pollution and ensuring adherence to environmental regulation and legislation.

2.1 Health, Safety and Environmental Policy Statement

Egdon Resources plc
Health, Safety and Environmental Policy Statement

As a responsible oil and gas exploration and production business, we are highly conscious of our responsibilities and are mindful of the potential risks to people and the environment. We are committed to high standards of Health, Safety and Environmental management, protection and performance and these aspects have equal prominence with other business considerations in the decision making process.

Egdon will ensure, that from initial concept and surveying, through to exploration, development, production and site restoration:-

- All Egdon sites are operated and managed to ensure compliance with Health, Safety and Environmental legislation and regulation
- Health, Safety and Environmental issues are considered, identified and understood at all company levels
- Employees – both direct and sub-contracted – are aware of Health, Safety and Environmental perspectives in relation to their roles and have sufficient training and resources to ensure that Egdon sites operate to high standards
- Activities that have the potential to impact on people and the environment are identified through a process that identifies risks
- Risks are eliminated, or reduced to an absolute minimum through the application of preventative and control measures
- Equipment, operations, working practices and systems of work are managed, maintained, monitored and reviewed to ensure that risks to people and the environment remain low
- Management Systems, procedural controls and local rules are defined and implemented
- Pollution potential is prevented and minimised through high standards of site design and infrastructure, and appropriate control mechanisms
- Where appropriate, Health, Safety and Environmental measures and objectives are set and reviewed with the aim of improving performance
- We are a "good neighbour" in the communities in which we operate, and will be open and transparent in relation to all of our activities

This Policy Document summarises and demonstrates Egdon's commitment to Health, Safety and Environmental issues, and to the systems established and implemented to ensure that the aims of this Policy are achieved

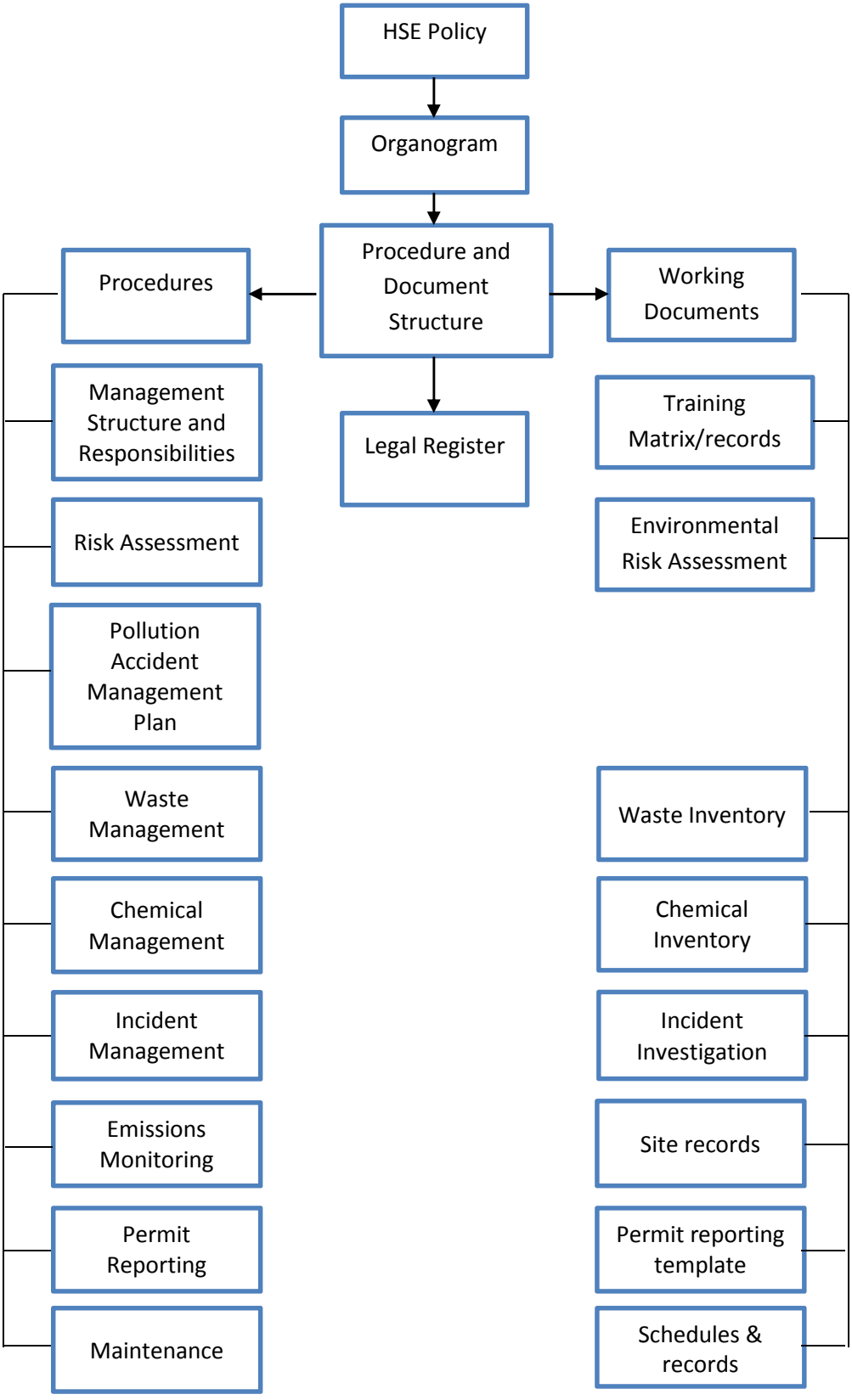
M. Abbott

Mark Abbott
Managing Director

First Issue January 2013 Revision 3 October 2015

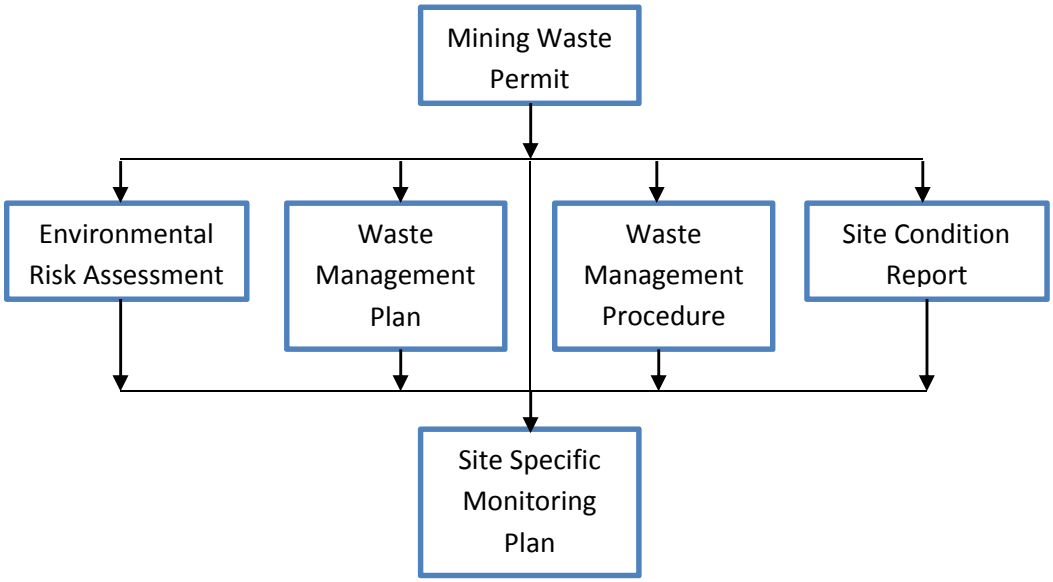
3. Egdon's Environmental Management System:- Overview

The over-arching structure of Egdon's management system is summarised as below. This system is designed to ensure that environmental issues are identified and control measures implemented to ensure that operational risks to the environment are minimised and that Egdon sites operate to high environmental standards



4. Specific Document Framework for Mining Waste Activities

To account for the additional requirements as defined through the Mining Waste Permit process, additional site-specific documentation is developed as follows.



In terms of managing wastes created on the site during the operation, Egdon's Waste Management Procedure for the drill site details the mechanisms, roles and responsibilities that will apply. This procedure is appended to this document.

ISSUE DATE	September 2013
ISSUED BY	Egdon Production & HSE Manager
REVISION NUMBER	

5. Summary

This procedure details the management and control of wastes generated on Egdon sites, to ensure that the all wastes are managed in accordance with regulatory and legal requirements, correct documentation is compiled and that accurate records of waste transfers are kept.

6. Definitions

- WTN – Waste Transfer Note
- Waste Code – Individual waste codes that reference each specific waste type
- SIC - Standard Industrial Classification code. Each business sector is allocated specific SIC codes as follows:-

2007 SIC codes

- 06.10: Extraction of crude petroleum

- 06.20: Extraction of natural gas

These replaced the 2003 SIC code 11.10: Extraction of crude petroleum and natural gas

- Hazardous Waste Licence – A licence issued by the Environment Agency for individual sites that produce more than 500kg of hazardous waste per year, Egdon is aware that the requirement to obtain a Hazardous Waste Licence from the Environment Agency was removed April 2016.

7. Resources Required

Impermeable gloves, standard PPE and goggles for dealing with leaks or spillages;

Spill kit – on site near storage tank bund

Eyewash station – located in the office

Fire extinguishers

Respirators (if required)

Pollution Accident Management Plan

Site Waste Inventory

8. Safety

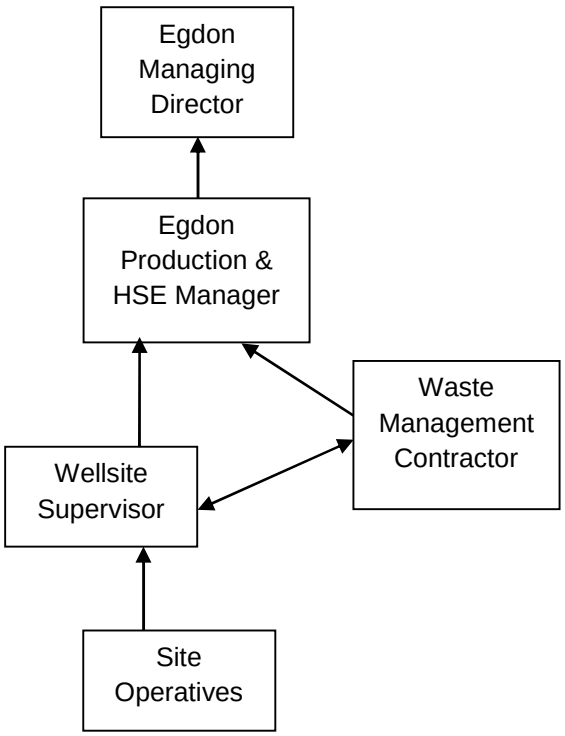
All personnel on site should understand, or be made aware of, the hazardous area site plan.

Standard PPE should be worn on site, plus goggles and impermeable gloves for dealing with any leaks or spillages.

9. Roles and Responsibilities

Egdon Resources U.K. Ltd operate the Wressle oil exploration and production site. In terms of environmental and waste issues, the on-site responsibility for adherence to Egdon's documented procedures is the Wellsite Supervisor, who reports directly to Egdons Production and HSE Manager.

For drilling operations, a nominated Waste Management Contractor is contractually engaged to co-ordinate and manage waste streams arising from the drilling operation. The concise reporting structure is as follows:-



Roles and Responsibilities

Site Operatives

- Initial management of waste streams
- Ensuring Wastes are segregated and contained within appropriate waste containment on site
- Preventing spillages from waste streams
- Reporting any incidents to the Wellsite Supervisor
- First-response to spillages

Wellsite Supervisor

- Managing wastes on site, including clean-up of spills as necessary (reference Pollution Accident Management Plan)
- Ensuring control measures as defined within the Environmental Risk Assessment are applied
- Maintaining the contents of the spill kit on site
- Arranging waste transfers from site as and when required
- Completing on-site Waste Transfer Note documentation
- Filing Waste Transfer Notes

Waste Management Contractor

- Co-ordinating waste transfers off-site via waste carriers and waste receiving locations
- Ensuring that the waste carriers and waste receiving facilities are licenced to move, receive and dispose
- Updating the Waste Inventory after each transfer of waste off site in accordance with Egdon procedures
- Communication with Egdon's Production and HSE Manager on waste issues, and training needs

Egdon Production and HSE Manager

- Ensuring that all contractors used are licenced to take waste from Egdon sites
- Completion and maintenance of the site Waste Management Plan, and ensuring that the Waste Management Plan is disseminated to the Wellsite Supervisor for communication with the site operatives, and to the Waste Management Contractor
- Auditing waste activities on wellsites in accordance with the Risk Assessment and Waste Management Plan
- Ensuring the requirements of the Mining Waste Permit are fulfilled
- Ensuring that waste management training is delivered where necessary to site workers

- Registering Hazardous Waste Licences for Egdon sites if hazardous wastes from any site exceed 500kg per year (registration can be completed on line through the Environment Agency website)

Egdon Managing Director

- Overall responsibility for ensuring that the Mining Waste Activity is applied and operated in accordance with relevant legislation and permit requirements.

10. Additional Requirements

All waste taken from site will be taken by licenced waste contractors, and final disposal sites must also be licenced.

11. Procedure

Drilling and treatment activities will produce main waste streams as identified within the following table. As far as is possible, waste streams will be segregated, and the management of individual wastes will be progressed as per the site Waste Management Plan.

Summary of waste streams

- Oil based drilling mud
- Water based drilling mud
- LCM (Loss Control Material)
- Formation cuttings
- Solidified excess cement
- Returning Fluids
- Natural gas (methane)
- Effluent tank sludge
- General waste
- General waste packaging
- Used oiled rags
- Used oiled absorbents
- Used engine oil
- Used oil filters

If wastes are created as a result of a spillage on site, refer to the Pollution Accident Management Plan for response mechanism.

When waste transfers are required:-

- Wellsite Manager (or nominated person) to contact waste carrier to arrange collection and oversee waste transfer off site
- Sign, complete and file waste transfer documentation supplied by waste carrier

- When the waste has been transferred off site, The contracted Waste Management Contractor will complete the Waste Inventory, entering details for the individual waste consignment in relation to:
  - Date
  - Waste type
  - Quantity of waste transferred and the measurement unit
  - Waste Carrier
  - Waste Transfer Note number
  - Treatment method
  - Final disposal site
  - Waste code (found on the Waste Transfer Note)

On completion of the wellsite activity, the Waste Management Contractor will ensure that the completed Waste Inventory, and associated disposal documentation, is transferred back to Egdons Production and HSE Manager.

Note: The Waste Transfer Note is a legal document and must be kept in relation to every waste transfer from site.

Waste carrier and disposal sites

All waste carriers, and final-location waste disposal sites, must be legally registered to haul and dispose of waste. Each year, the hauliers and waste disposal sites used will be contacted and copies of their waste carriers and waste disposal site licences will be obtained to ensure that they are operating legally. A summary of the licence details, and expiry dates, will be added to the Waste Inventory and file copies kept of the relevant documents. This process will be undertaken by the Site Supervisor.

12. Emergencies

In the event of the site fire or gas alarm activation (if applicable), the operation must be stopped immediately, and personnel evacuated from the site.

In the event of any spillages, the site Pollution Accident Management Plan details the response measures.

13. References

Site Hazardous zone plan

Pollution Accident Management Plan

Waste Management Plan

Environmental Risk Assessment

Contacts list

Waste Inventory

Waste Transfer Notes

Waste Carriers Licenses

Hazardous Waste Licenses

14. Appendicies

n/a

AMENDMENTS

Location (Page)	Change Description	Reason for Change	Issue	Date

APPENDIX 3 – PROPPANT CARRIER FLUID DISCLOSURE

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PROPPANT CARRIER FLUID DISCLOSURE: **WRESSLE-1 WELL**

Proppant Carrier Fluid Data

Total Volume of Carrier Fluid (m^3)	170.34
% of Water Volume - fresh water	~40%
% of Potsium Chloride	~57%
% of Other Fluid Additives	~3%
Proppant (kg)	20, 000 to 30,000

Proppant Carrier Products

Product Trade Names	Product Purpose in Well	Concentration per M^3	Volume	Supplier	MSDS Provided
B197	Surfactant	1.93 ltr	0.34m^3	Schlumberger	Yes
B232	Demulsifier	1.93 ltr	0.34m^3	Schlumberger	Yes
B269	Gelling Agent	5.39 ltr	0.96m^3	Schlumberger	Yes
B390	BODOXIN AE	0.48 ltr	0.08m^3	Schlumberger	Yes
J218	Breaker	0.58 kg	102.06kg	Schlumberger	Yes
J450	Stabilizing Agent	0.96 ltr	0.17m^3	Schlumberger	Yes
J475	Breaker	1.16 kg	200.12kg	Schlumberger	Yes
J511	Stabilizing Agent	1.16 kg	142.88kg	Schlumberger	Yes
L010	Crosslinker	5.30 ltr	0.85m^3	Schlumberger	Yes
M117	Clay Control Agent	0.40 ltr	71.95m^3	Schlumberger	Yes
U028	Activator	2.89 ltr	0.51m^3	Schlumberger	Yes

Proppant Carrier Constituents

Chemical Substance in Proppant Carrier Fluid	Chemical Abstract Service Number (CAS Number)	Maximum Chemical substance Mass % in Carrier Fluid	Presumed Hazardous or Non-hazardous (EA/WFD)	Basis of Assessment
Sodium hydroxide	1310-73-2	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Alkyl hydroxyethyl benzyl ammonium chloride	61789-68-2	<0.1	Hazardous	Refer to JAGDAG Assessment*
Propan-2-ol	67-63-0	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Diannonium peroxidisulphate	7727-54-0	<1	Non-Hazardous	Refer to JAGDAG Assessment*
2,2'2"-nitrilotriethanol	102-71-6	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
2-butoxyethanol	111-76-2	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Ethaxylated C11 linear/branched alcohols (7eo)	34398-01-1	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Alcohols, C12-15 linear, ethoxylated	68131-39-5	<0.1	Hazardous	Refer to JAGDAG Assessment*
(Ethylenedioxy)dimenthanal	3586-55-8	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Patassium Chloride	7447-40-7	~57	Non-Hazardous	Refer to JAGDAG Assessment*
Boric acid	10043-35-3	<1	Hazardous	Refer to JAGDAG Assessment*
Sorbitol	50-70-4	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Silican dioxide	7631-86-9	<0.001	Non-Hazardous	Refer to JAGDAG Assessment*
Sodium chloride	7647-14-5	~2	Non-Hazardous	Refer to JAGDAG Assessment*
Guar gum	9000-30-0	<1	Non-Hazardous	Refer to JAGDAG Assessment*
Poly(tetrafluoroethylene)	9002-84-0	<0.001	Non-Hazardous	Refer to JAGDAG Assessment*
Magnesium silcate hydrate (talc)	14807-96-6	<0.001	Non-Hazardous	Refer to JAGDAG Assessment*
Vinylidene chloride/methylacrylate copolymer	25038-72-6	<0.1	Non-Hazardous	Refer to JAGDAG Assessment*
Distillates, petroleum, hydrotreated light	64742-47-8	<1	Non-Hazardous	Refer to JAGDAG Assessment*
Amine treated smectite clay	68153-30-0	<0.01	Non-Hazardous	Refer to JAGDAG Assessment*

*Assessed using Methodology for the determination of hazardous substances for the purposes of the Groundwater Daughter Directive (2006/118EC), issued by the Joint Agencies Groundwater Directive Advisory Group ("JAGDAG") comprising the Environment Agency, the Scottish Environment Protection Agency, and the Northern Ireland Environment Agency, the Department of Environment, Food & Rural Affairs, Welsh Assembly Government, the Environmental Protection Agency Ireland, Health Protection Agency and industry representatives.

Notes:
All chemical substance data is consistent with the Material Safety Data Sheets (MSDS), which are provided with document number ER-EPRA-W1-FC-009.

Land work Stimulation - UK **Jun-16** **Version 2**

Components (CAS No)	Components (Name)	Hazardous Classification	List I (hazardous)	List II (non-Hazardous)	Radioactive substance?	PBT substance? (REACH definition and TGB)	1)High B or High T (REACH/TGD and CLP)	2) vPvB substance? (REACH)	3)CMT substance (CLP)?	4) is the substance very acutely toxic to aquatic biota? (LC50/EC50<0.1mg/l;	5) persistent substance and potentially very toxic to human?	Echa data available	JAGDAG hazardous substance?	Comments
1310-73-2	Sodium hydroxide	Met. Corr. 1 (H290) Skin Corr. 1A (H314)	No	No	No	PBT doesn't apply it is inorganic	No	N/A	No	No	No	yes	Non-hazardous according JAGDAG's guidelines	Does not meet criteria for hazardous
61789-68-2	Alkyl hydroxyethyl benzyl ammonium chloride	Skin Corr. 1B (H314) Acute Tox. 4 (H302) Aquatic Acute 1 (H400)	No	No	No	No	NoEC is <0.05mg/l Algae Aquatic Acute 1 (H400)	No	No	No	No	No	Hazardous	
67-63-0	Propan-2-ol	Flam. Liq. 2, (H225) STOT SE 3 (H336) Eye Irrit. 2 (H319)	No	No	No	No	No	No	No	No	No	Yes	Non-hazardous according report AmecFosterWheeler	PLONOR
7727-54-0	Diammonium peroxidisulphate	STOT SE 3 (H335) Skin Irrit. 2 (H315) Ox. Sol 3 (H272) Acute Tox. 4 (H302) Skin Sens. 1 (H317) Eye Irrit. 2 (H319) Resp. Sens. 1 (H334)	No	No	No	PBT doesn't apply it is inorganic	No	N/A	No	No	N/A	Yes	Non-hazardous according JAGDAG's guidelines	
102-71-6	2,2`,2"-nitrilotriethanol	NC	No	No	No	No	No	No	No	No	No		Non-hazardous according JAGDAG's guidelines	
111-76-2	2-butoxyethanol	Acute Tox. 4 (H302) Acute Tox. 4 (H312) Acute Tox. 4 (H332) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319)	No	No	No	No	No	No	No	No	No	Yes	Non-hazardous according report AmecFosterWheeler	
34398-01-1	Ethoxylated C11 linear/branched alcohols (7eo)	Acute toxicity (Oral) Cat.4 (H302) Eye Dam. 1 (H318) Skin Irritation Cat. 2 (H315) Aquatic Chronic Cat. 2 (H411)	No	No	No	No	No	No	No	No	No	No	Non-hazardous	
68131-39-5	Alcohols, C12-15 linear, ethoxylated	Eye Dam. 1 (H318) Aquatic Acute. 1 (H400) Aquatic Chronic. 3 (H412)	No	No	No	No	Aquatic Acute. 1 (H400)	No	No	No	No	Yes	Hazardous	
3586-55-8	(Ethylenedioxy)dimethanol	Acute Tox. 4; H302 Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Dam. 1; H318	No	No	No	No	No	No	No	No	No	No	Non-hazardous	
7447-40-7	Potassium Chloride	NC	No	No	No	PBT doesn't apply it is inorganic	No	N/A	No	No	N/A	Yes	Non-hazardous	PLONOR
10043-35-3	Boric acid	Repr. 1B (H360FD)	No	No	No	PBT doesn't apply it is inorganic	Yes	N/A	Yes	No	N/A	No	Hazardous	
50-70-4	Sorbitol	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	PLONOR
7631-86-9	Silicone dioxide	NC	No	No	No	PBT doesn't apply it is inorganic	No	No	No	No	No	Yes	Non-hazardous	PLONOR
7647-14-5	Sodium chloride	NC	No	No	No	PBT doesn't apply it is inorganic	No	No	No	No	No	Yes	Non-hazardous	PLONOR
9000-30-0	Guar gum	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	PLONOR
9002-84-0	Poly(tetrafluoroethylene)	NC	No	No	No	No	No	Not known	No	No	No	No	Non-hazardous	
14807-96-6	Magnesium silicate hydrate (talc)	NC	No	No	No	PBT doesn't apply it is inorganic	No	No	No	No	No	No	Non-hazardous	
25038-72-6	Vinylidene chloride/methylacrylate copolymer	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	
64742-47-8	Distillitaes, petroleum, hydrotreated light	Asp. Tox. 1 (H304) EUH066	No	No	No	No	No	No	No	No	No	Yes	Non-hazardous	
68153-30-0	Amine treated smectitie clay	NC	No	No	No	No	No	No	No	No	No	No	Non-hazardous	

*ECHA data
NC: not classified
EA: UK Environmental Agency

APPENDIX 4 – FLARE SPECIFICATION

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FLARE PRODUCTS LTD

Unit 14, Broadmead Business Park, Broadmead Road
Stewartby, Bedford, MK43 9NX, England
Tel: 01234 767755 Fax: 01234 768624

Email: sales@flareproducts.co.uk Web: www.flareproducts.co.uk

Registered in England No: 1607975 VAT REG: 365966990

Directors: Mr S.A. Simpson, Mr A.K Simpson, Mrs M Simpson

CONTENTS

1. DESCRIPTION OF EQUIPMENT OFFERED

    1.1 C 500 E.T.C. (Enclosed Thermal Combustor) Ground Flare

    1.2 Combustion Chamber

    1.3 Chamber Lining

    1.4 Burner & Manifold

    1.5 Pilot

    1.6 Ignition System

    1.7 Associated Equipment

2. PROCESS & UTILITIES DATA

1. DESCRIPTION OF EQUIPMENT OFFERED

1.1 Ground Flare Type - E.T.C. 500

1.2 Combustion Chamber

In order to control and burn without any undue noise or radiation we have pleasure in offering our E.T.C. -500 (Enclosed Thermal Combustor).

The waste gas is fed into a 200mm manifold which distributed via four individual headers into the combustion chamber. Each header has a manual control valve to allow the flare to be operated at 25-50-75-100 % of the design flow. There will be four burner headers located within the combustion chamber. Each header has a burner firing vertically in a circular blanked lined combustion chamber.

The chamber is open at the top and raised off the ground to allow air to be entrained for complete combustion of the waste gas.

It is supported at a height of 0.9 meters on four legs welded to the outside of the chamber. This allows natural draught air to be pulled in for good air/gas mixing inside the chamber.

Surrounding the chamber is a specially designed caged guard for the protection of plant and personnel whilst the combustor is operational. It is built in four sections.

The combustion chamber, guards and all associated parts are fabricated stainless steel.

The chamber will sit on the mobile flare platform on top of a table with a height of 1 meter.

1.3 Chamber Lining

The internal walls of the chamber have stainless steel anchor bolts welded to them. These hold the chamber lining in place by means of stainless steel retainers. Two layers of ceramic blanket line the inside of the combustion chamber. The blanket is further held in position by stainless steel expanded mesh. Using this blanket enables full flow capacity to be used instantly, whereas with normal refractory lining a slow build up to maximum temperature has to be allowed for in order to prevent cracking.

Key features of the blanket are:

Lightweight	–	for quick thermal response;
Good acoustic properties	–	reflecting rather than absorbing noise;
Low thermal conductivity	–	heat is not transmitted to outer face of the chamber.

Unaffected by oil, steam and water this blanket has been used and found satisfactory on many ground flares.

1.4 Burner & Manifolds

The burner configuration consists of a 200mm manifold outside the combustion chamber feeding the rows of burner headers, which in turn supply the individual burner head.

There will be four burners manufactured from 310 stainless steel. Each burner is positioned directly adjacent to its neighbour and is complete with its individual air inspirating mixing head. This improves stability and ensures positive cross lighting between them.

The burners used are low flame high heat bar burners designed to achieve a retention time of 0.3 seconds minimum.

1.5 Pilot - 3 Number

The flare pilot is designed to ignite and stay alight during all extremes of weather. As with most pilot systems, the initial air for combustion is drawn in by an inspirator on the lower part of the pilot, but unlike other systems our unique design of pilot nozzle draws in secondary air which ensures efficient combustion.

1.6 Ignition System

The fully automatic ignition system incorporates a thermocouple in the pilot. The ignition sequence is initiated either manually at the control cabinet, or automatically via a remote switch. The pilot and ignitor solenoid valves open allowing gas to flow to the pilots and ignitor. On the pilot being established, via a flame front generator, a signal is sent to the electrical panel, which opens the main valves, activates a relay and illuminates the ‘Pilot On’ light on the panel door. The unit will then cease operating but will continue to monitor the pilot flame.

Should, after a timed period, the pilot fail to ignite, volt free contacts in the panel close and a remote alarm will be activated.

Ignition Control Panel

The electrical system is enclosed in a weatherproof cabinet, designed in accordance with IP65.

The control panel will be fully suitable for Zone 1 use and ATEX compliant
(European Union Directive).

On the door are:

THREE Lights	–	showing pilot on;
THREE Lights	–	showing pilot off;
ONE Light	–	showing pilot failed;
ONE Light	–	showing system available;
Selector Switch	–	for ON/OFF/AUTO mode;
ONE	–	Emergency Stop Button;
ONE	–	Manual Start Button;
ONE	–	Manual Stop Button;
ONE	–	Reset Button.

Included in the cabinet are the following.

a. Purge/Spark Timer

A cyclic timer is supplied, which alternately gives a spark period followed by purge period. The spark period can be adjusted within the range of 0 and 30 seconds, and the purge period 0 and 30 seconds.

b. Alarm Timer

This has an adjustable period of 0 to 5 minutes, after which, if ignition has not been established, an alarm is given and the flare adopts a safe shutdown mode.

c. Pilot Temperature Controller – 3 Number, one for each pilot

This receives a signal from the thermocouple which, when the temperature is above a pre-set figure, cancels the ignition sequence and energises the main valve. Any failure of the pilot or main flame thereafter de-energises the main valves and re-energises the ignition sequence.

d. Relays

Various relays are provided for operating indicator lights and control circuits in the front panel.

e. All equipment to give full automatic control of the system.

1.7 Associated Equipment

Manual Inlet

A 200mm isolation valve is supplied at the entry to the burner gas train for manual isolation.

Panel Legs

One sturdy pair of legs will be supplied bolted to the panel.

Rainhood/Sunshield

In order to protect both panel and operating personnel, we will provide a rainhood/sunshield which will be mounted on the ignition panel to give protection from the elements.

Anti-Condensation Heater

For maintaining working temperature inside the weatherproof box during low temperature conditions, we will provide an anti-condensation heater controlled by a thermostat.

Flare Skid Assembly

The whole flare assembly, including control panel, pilot and ignitor pipe work, burner manifolds, burners, combustion chamber table, interconnecting pipe work, and all parts necessary for the system to work, with the exception of the combustion chamber, will be fixed on a frame assembly such that the only requirements for getting the system running will be the lifting of the chamber into position and the fixing of a power supply into the control panel and the connection of your main and ignition gas.

The frame assembly will be fabricated from carbon steel and to a paint finish.

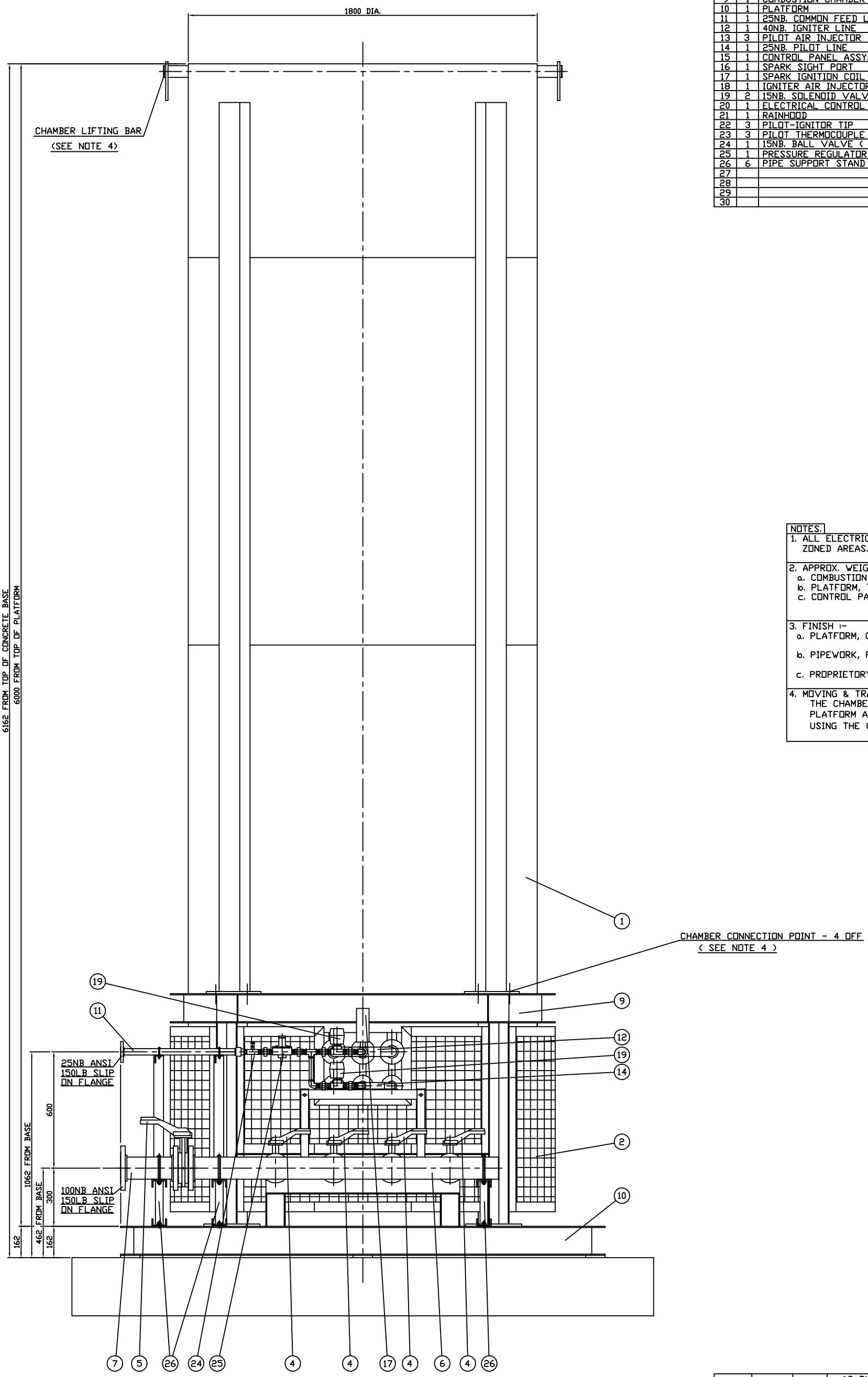
It will be approximately 2.8 meters wide and 7 meters long.

2. PROCESS & UTILITIES DATA

Maximum flow	scfd	:	500,000
Molecular weight		:	--
Flare Tip Type		:	Hi-Heat
Temperature of Gas	°C	:	35
"Air Barrier" Seal		:	-
Flare Stack Type		:	Enclosed.
Flare Stack height	meters	:	9
Purge gas required		:	N/A
Pressure drop tip	m/Bar	:	2.9
Pressure drop riser & inlet	m/Bar	:	0.45
Total pressure drop for complete system	m/Bar	:	20
Maximum smokeless flow	M^3/Hr	:	TOTAL
Pilot fuel gas type		:	Process
Pilot fuel gas amount	M^3/Hr	:	1
Pilot fuel gas pressure	m/Bar	:	20
Ignition fuel gas type		:	Process
Ignition fuel gas amount (intermittent)	M^3/Hr	:	1
Ignition fuel gas pressure	m/Bar	:	20
Ignition compressed air amount		:	} FREE } AIR
Ignition compressed air pressure		:	} VENTURI
Electrical supply required for ignition		:	240V
Electrical power required		:	10 AMPS

Drawings provided below are representative of the proposed E.T.C. 500 (Enclosed Thermal Combustor) ground flare, albeit indicating a maximum flow rate of 200,000scfd. The general layout of the E.T.C. 500 ground flare will be the same.

REF.	QTY.	DESCRIPTION
1	1	COMBUSTION CHAMBER
2	1	4 PART CHAMBER GUARD
3	4	HI-HEAT BURNER HEAD
4	4	50NB. MANUAL ISOLATION BUTTERFLY VALVE
5	1	100NB. MANUAL ISOLATION BUTTERFLY VALVE
6	1	100NB. BURNER MANIFOLD
7	1	100NB. MAIN LINE
8	4	50NB. BURNER HEADER
9	1	COMBUSTION CHAMBER SUPPORT TABLE
10	1	PLATFORM
11	1	25NB. COMMON FEED LINE (PILOT/IGNITER LINES)
12	1	40NB. IGNITER LINE
13	3	PILOT AIR INJECTOR
14	1	25NB. PILOT LINE
15	1	CONTROL PANEL ASSY.
16	1	SPARK SIGHT PORT
17	1	SPARK IGNITION COIL
18	1	IGNITER AIR INJECTOR
19	2	15NB. SOLENOID VALVE 110V
20	1	ELECTRICAL CONTROL CABINET
21	1	RAINHOOD
22	3	PILOT-IGNITOR TIP
23	3	PILOT THERMOCOUPLE
24	1	15NB. BALL VALVE (LOCKABLE)
25	1	PRESSURE REGULATOR
26	6	PIPE SUPPORT STAND
27		
28		
29		
30		



VIEW ON ARROW 'A'

NOTES.

1. ALL ELECTRICAL EQUIPMENT SUITABLE FOR USE INSIDE ZONED AREAS.

2. APPROX. WEIGHTS :-
   a. COMBUSTION CHAMBER —— 2500KG.
   b. PLATFORM, TABLE, PIPEWORK —— 1750KG.
   c. CONTROL PANEL ASSY. —— 350KG.

3. FINISH :-
   a. PLATFORM, CHAMBER, TABLE, GUARDS & CONTROL PANEL —— CARBON STEEL PAINTED
   b. PIPEWORK, FLANGES, FLANGE BOLTS & BURNERS —— STAINLESS STEEL SELF COLOUR
   c. PROPRIETORY EQUIPMENT —— MANUFACTURERS STANDARD

4. MOVING & TRANSPORTATION :-
   THE CHAMBER MUST BE DISCONNECTED FROM THE MOBILE PLATFORM AND MOVED OR TRANSPORTED SEPERATELY USING THE CHAMBER LIFTING BAR

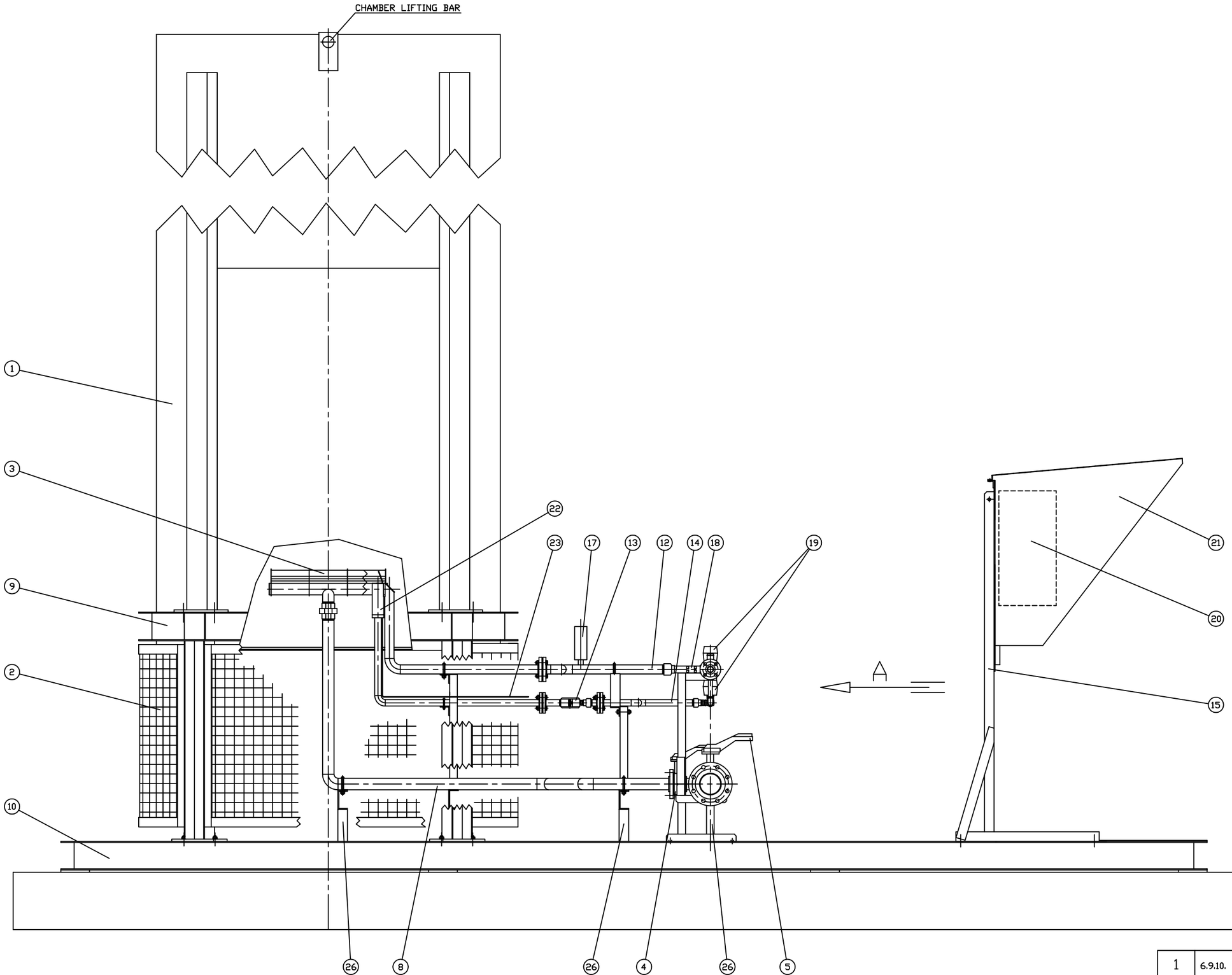
REV.NO.	DATE	DRN.	DESCRIPTION
1	6.9.10.	R.L.A.	a. AS BUILT

FLARE PRODUCTS Ltd.
Unit 14,Broadmead Business Park
Broadmead Rd.,
Stewartby Beds. MK43 9NX

JOB NO 2336

TITLE:-
G.A. 200,000 scfd PLATFORM MOUNTED FLARE
STAR ENERGY - REMPSTONE

DRN	DATE	SCALE	DRN NO		REV
R.L.A.	6.4.10.	1:10		A12019 SHT. 1 OF 3	1
CHKD	DATE				



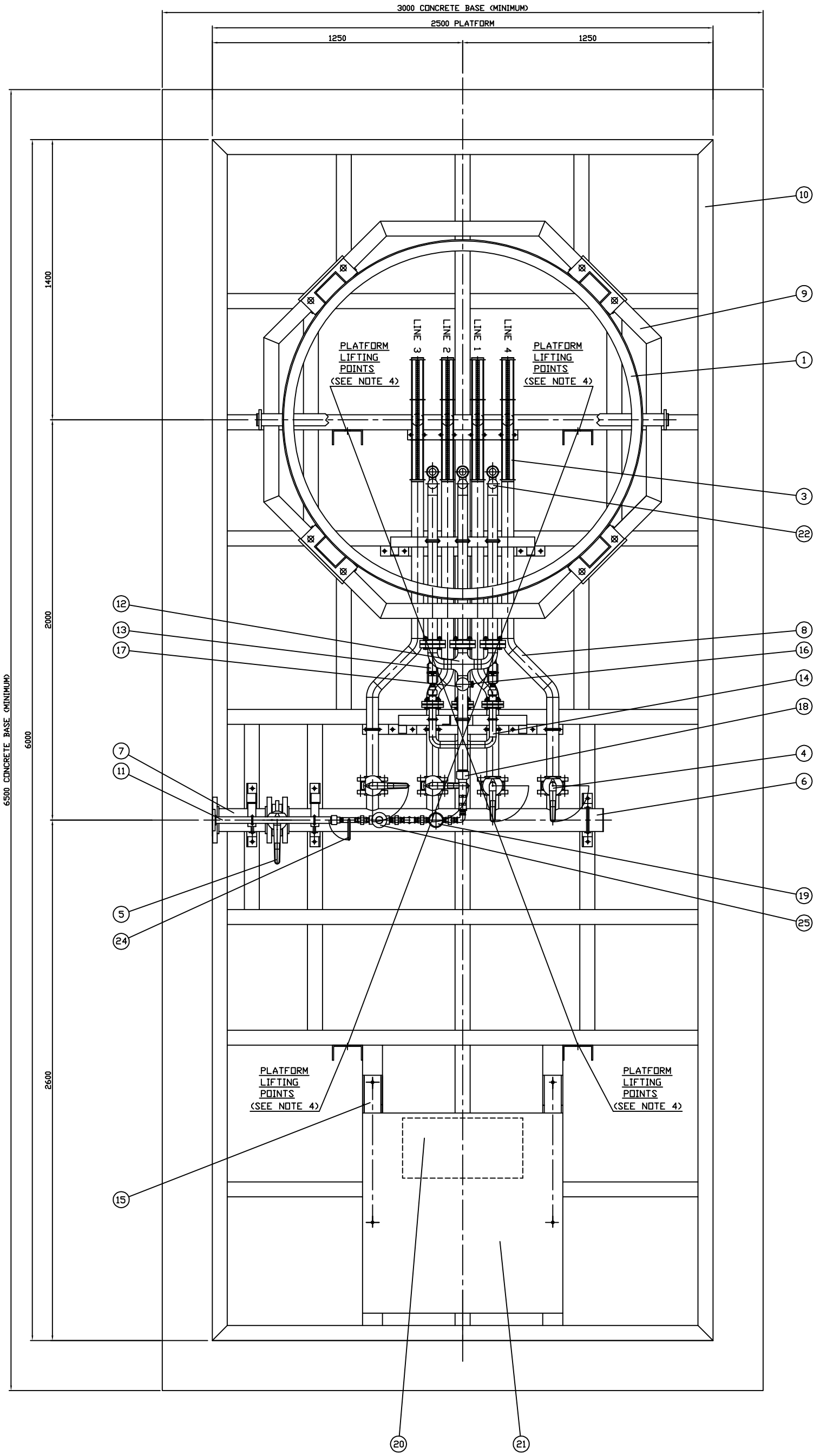
REV.NO.	DATE	DRN.	DESCRIPTION
1	6.9.10.	R.L.A.	a. AS BUILT

FLARE PRODUCTS Ltd.
Unit 14,Broadmead Business Park
Broadmead Rd.,
Stewartby Beds. MK43 9NX

JOB NO 2336

TITLE:-
G.A. 200,000 scfd PLATFORM MOUNTED FLARE
STAR ENERGY - REMPSTONE

DRN	DATE	SCALE	DRN NO		REV
R.L.A.	6.4.10.	1:10	A12019	SHT. 2 OF 3	1
CHKD	DATE				



REV.NO.	DATE	DRN.	DESCRIPTION
1	6.9.10.	R.L.A.	a. AS BUILT

FLARE PRODUCTS Ltd.
Unit 14,Broadmead Business Park
Broadmead Rd.,
Stewartby Beds. MK43 9NX

JOB NO 2336

TITLE:-
G.A. 200,000 scfd PLATFORM MOUNTED FLARE
STAR ENERGY - REMPSTONE

DRN	DATE	SCALE	DRN NO		REV
R.L.A.	6.4.10.	1:10		A12019 SHT. 3 OF 3	1
CHKD	DATE				

Document:	**Environmental Risk Assessment**
Document Number:	**ER-EPRA-W1-ERA-007**

Environmental Risk Assessment

Wressle Wellsite

Wressle-1

Hydrocarbon Production and Short Duration Well Operations, including Near Wellbore Treatments and Proppant Squeeze Operations

3rd June 2016

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CONTENTS

1. Introduction 5
2. Scope 5
3. Definitions 6
4. Methodology 7

Appendix 1 – Wressle-1 Wellsite Environmental Risk Assessment 9

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1. INTRODUCTION

Egdon Resources U.K. Limited (Egdon Resources) is a subsidiary of Egdon Resources PLC, which was formed in 1997 and was awarded its first licence in 1998 and gained its first operated licence in 2000. Under the Petroleum Licensing system this permits the licence holder to '*search and bore for and get petroleum within the licence boundary'* subject to the granting of planning permission, in accordance with the Town and Country Planning Act 1990. Egdon Resources is an international petroleum exploration, development and production company with operations in the United Kingdom and France. The United Kingdom operations are conducted through Egdon Resources U.K. Limited and are directed from the registered office in Hampshire.

Egdon Resources is engaged in the exploration and production of petroleum onshore United Kingdom and holds 25% in the Petroleum Exploration and Development Licence 180 (PEDL 180) with the remaining interest held by Europa Oil and Gas (33.34%), Celtique (33.33%) and Union Jack Oil (8.33%). Within PEDL 180, Egdon Resources, as the operator, have successfully drilled and tested the Wressle-1 exploratory borehole.

In support of the permit variation for production and short duration well operations at the Wressle wellsite, an Environmental Risk Assessment has been undertaken. The Environmental Risk Assessment has been carried out in accordance with the Environment Agency guidance provided on the www.gov.uk website.

2. SCOPE

This Environmental Risk Assessment is applicable to the Wressle-1 wellsite and all production, near wellbore treatments and proppant squeeze operations proposed therein, in accordance with planning consent. It is provided in support of an application to the Environment Agency under the Environmental Permitting (England and Wales) Regulations 2010, as amended.

3. DEFINITIONS

Below is a list of definitions that are used on the H1 Environmental Risk Assessment Template.

ID:	Identification number the hazard has been given to allow for easy referencing.
Source:	A source of pollutants from the activity taking place such as flaring. (Source can also be referred to as 'hazard').
Receptor:	Although the likelihood of pollution is low it may have an adverse effect on surrounding residents, wildlife and habitats; these are known as the pollutants receptors.
Pathway:	The pathway the pollutant is taking such as air or unsaturated zones.
Risk Management:	Mitigation measures that will be put in place to control the risks so far as reasonably practicable.
Probability of Exposure:	The chance of the hazard occurring taking into account mitigation measures.
Consequence:	A result of an event or action that has occurred.
Overall Risk:	A hazard that has been assessed and has been given a risk rating level post mitigation measures i.e. not significant, low, medium, high very high etc.
Not Significant:	The severity of risk together with the likelihood of the risk is not expected to cause harm to the environment.
Low:	The severity of risk together with the likelihood of the risk has low potential for causing harm to the environment.
Medium:	The severity of risk together with the likelihood of the risk has a moderate potential for causing harm to the environment.
High:	The severity of risk together with the likelihood of the risk has a high potential for causing harm to the environment.
PEDL:	Petroleum Exploration Development License.

4. METHODOLOGY

The structure of the Environmental Risk Assessment is consistent with the Environment Agency guidance using a source pathway receptor model and includes:

- Identifying the risk from the site;
- Assessing risks and checking they are acceptable;
- Justifying appropriate measures to control the risk (if needed); and
- Presenting the risk assessment.

The Environmental Risk Assessment has included the following items, which have been reviewed for applicability within the Wressle-1 production, near wellbore treatments and proppant squeeze operations.

- Accidents & incidents that have potential to cause harm to the environment;
- Air emissions;
- Dust;
- Fugitive emissions;
- Global warming potential;
- Light;
- Noise;
- Odour;
- Releases to water; and
- Waste.

This Environmental Risk Assessment is qualitative and details the activities and events that may lead to environmental impact on one or more receptors.

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APPENDIX 1 – WRESSLE-1 WELLSITE ENVIRONMENTAL RISK ASSESSMENT

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Receptors

Type	Name	Distance from Site	Name	Distance from Site
Local Residents	Lodge Farm	0.30km	Wressle	1.57km
	Broughton Common	0.71km	Broughton	1.61km
	Decoy Farm	0.71km	Springwood Cottage	1.64km
	Kebwood Farm	1.00km	Watermill Place	1.84km
	For Wood Farm	1.17km	Poultry Farm	2.00km
	Sewage works	1.24km	Broughton Grange	7.80km
	Heron Lodge	1.50km	Broughton Grange Cottages	8.40km
Watercourses	Ella Beck “Main River”. Circumventing the site.	0.06km	Small Fish Pond 1 at the Priory	1.42km
	Dyke East Of Site First drain down gradient of the wellsite	0.18km	Small Pond 3 at Far Wood Farm	1.46km
	Large dyke, running northwards into River Humber	0.39km	Spring 1 near Far Wood Farm discharging to the southeast	1.47km
	Small Pond east of Rowland Plantation	0.59km	Planker Dike Running from the sewage works to the pumping station	1.49km
	Sir Rowland Winn’s Drain Running northwards	0.68km	Spring 2 near Far Wood Farm discharging to the southeast	1.53km
	Small Pond at The Lodge. Water on either side of the B1208 road	0.87km	Appleby Old River Ancholme from the Pumping station to Roxby Carrs	1.57km
	Large Pond	0.97km	New River Ancholme, Bunded river, running northward to River Humber	1.58km
	Small Pond at Common Farm	1.00km	Small Pond southwest of Appleby Carrs Pumping Station	1.76km
	Small Pond at Kebwood Farm	1.04km	Small Pond at Wressle Wood	1.80km
	Small Pond Small Pond south of Broughton Grange	1.10km	Small Pond at Broom Hill	1.84km
	Small Pond 1 at Far Wood Farm	1.28km	Small Pond at Watermill Place fed by Moor Beck	1.90km
	Small Pond 2 at Far Wood Farm	1.28km	Large Pond at The Follies	1.91km
	Large Pond at near Birdhouse Clough	1.32km	Moor Beck Running eastward and joining Ella Beck	1.91km
	Small Fish Pond 3 at the Priory	1.32km	Small Pond at Appleby Carrs Pumping Station	2.00km
	Small Fish Pond 2 at the Priory	1.34km	Spring at Westwood Lodge discharging to the east	2.00km
Sites of Specific Scientific Interest (SSSI)	Broughton Far Wood	0.58km	Conesby Quarry	7.37km
	Broughton Alder Wood	1.20km	Messingham Sand Quarry	8.62km
	Castlethorpe Tufas	3.67km	Manton Stone Quarry	8.85km
	Risby Warren	4.60km	South Ferriby Chalk Pit	8.96km
	Wrawby Moor	6.15km	Humber Estuary	10.00km
	Manton and Twigmoor	6.73km		
Special Protection Areas	Humber Estuary	10.00km		
RAMSAR Sites	Humber Estuary	10.00km		

Assessment of Odour Risks

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
001	Release of odour when breaking containment on tanks and pipework used in transporting produced fluid from the wellbore to surface storage tanks. Note: Produced fluid includes wellbore fluids, wellbore liquids and formation fluids.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office).	Site location is within rural area where local receptors are very few. Tanks and pipework to be tested for leaks as required by written procedures. Breaking containment of tanks and pipework systems is to be kept to a minimum. Tanks and pipework to be cleaned / purged where possible prior to breaking containment. Regular maintenance and inspections are to be conducted as directed by written procedures. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required. If required, an Odour Management Plan to be in place, distributed and adhered to by site personnel.	Odorous emissions may be released during breaking containment of the tanks / pipework. Breaking containment of tanks / pipework will be kept to a minimum – at end of operations or essential maintenance work only. Breaking of containment expected to be at end of operations only. N_2 purging to flare will be performed where practicable to minimise release.	Complaints of odours / smells in vicinity of local receptors. Will not last for more than 60 minutes.	Not significant if managed correctly.
002	Release of odour from produced fluids on the external surface of pipework / equipment at surface when used in transporting produced fluid from the wellbore to surface storage tanks. Note: Produced fluid includes wellbore fluids, wellbore liquids and formation fluids.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office).	Site location is within rural area where local receptors are very few. Tanks and pipework to be tested for leaks as required by written procedures. Pipework / equipment to be cleaned / purged where possible prior to pulling out of the hole. Regular maintenance and inspections are to be conducted as directed by written procedures. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required. If required an Odour Management Plan to be in place, distributed and adhered to by site personnel.	Odorous emissions may be released from pipework / equipment at surface after contact with produced fluids from within the wellbore. Pulling out of hole operations will be kept to a minimum or essential maintenance work only. N_2 purging to flare / well control fluid circulation and or renewal will be performed where practicable to minimise release.	Complaints of odours / smells in vicinity of local receptors. Will not last for more than 60 minutes.	Not significant if managed correctly.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
003	Release of odour from open top mud tanks when used in the transporting of well control fluid from the wellbore to surface.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office).	Site location is within rural area where local receptors are very few. Tanks and pipework to be tested for leaks as required by written procedures. Breaking containment of tanks and pipework systems is to be kept to a minimum. Tanks and pipework to be cleaned where possible prior to breaking containment. Regular maintenance and inspections are to be conducted as directed by written procedures. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required. If required an Odour Management Plan to be in place, distributed and adhered to by site personnel.	Odorous emissions may be released from open top mud tanks at surface from produced fluids. Breaking containment of tanks / pipework will be kept to a minimum – at end of operations or essential maintenance work only. N_2 purging to flare / well control fluid circulation and/or renewal will be performed where practicable to minimise release.	Complaints of odours / smells in vicinity of local receptors. Will not last for more than 60 minutes.	Not significant if managed correctly.
004	Release of odour from flaring of natural gas during production operations.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office).	Site location is within rural area where local receptors are very few. Flare equipment to be agreed by Environment Agency to ensure compliance prior to use. Monitoring of flare combustion temperature to be undertaken during periods of flaring. Cold venting of gases to atmosphere is prohibited. Flare equipment to be built according to manufacturer's and industry standards. Flare equipment to be tested for leaks prior to delivery / use as required by manufacturer / written procedures. Breaking containment of Flare equipment is to be kept to a minimum. Flare equipment to be cleaned / purged where possible prior to breaking containment. Regular maintenance and inspections are to be conducted as directed by written procedures. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required. If required an Odour Management Plan to be in place, distributed and adhered to by site personnel.	Odorous emissions are present when combustion of gases occurs. Odorous emissions may be released during flaring of natural gas.	Complaints of odours / smells in vicinity of local receptors.	Not significant if managed correctly.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
005	Storage / use / transfer and decanting of odorous products during operations.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office).	Site location is within rural area where local receptors are very few. Products known to emit odour or products that may emit odour when reacting with other products will be substituted where possible, for alternative non-odorous products which are deemed safe and effective. Chemicals / oils are to be segregated. Quantities of odorous chemicals / oils are to be kept to a minimum where possible. Containers are to be sealed when not in use. Containers are to be checked prior to / on delivery for signs of damage or leaks. Damaged / leaking containers are to be segregated and used as a priority where possible. Containers are to be checked periodically for signs of damage / leaks. During transfer / decanting of odorous chemicals / oils the following procedures are to be undertaken: • Containers are to be sealed when not in use; • Spillage pads / containers are to be used to ensure any spillages are contained and can be remediated effectively and efficiently; • Avoid direct sunlight where possible; and • Reduce evaporation rate by eliminating air flow and surface area. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required. If required an Odour Management Plan to be in place, distributed and adhered to by site personnel.	Odorous emissions may be released during transfer / decanting of chemicals / oils. Transfer / decanting of chemicals / oils will be kept to a minimum – at end of operations or essential maintenance work only. Breaking of containment expected to be at end of operations only. N_2 Purging to flare will be performed where practicable to minimise release.	Complaints of odours / smells in vicinity of local receptors. Will not last for more than 60 minutes.	Not significant if managed correctly.
006	Release of odour from storage of raw materials.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office).	Site location is within rural area where local receptors are very few. Use of raw materials that are less likely to cause odour problems. Quantity of materials to be planned to ensure that orders of biodegradable materials will be limited and excess quantities kept to a minimum. Materials to be managed, stored and handled correctly by competent personnel. Inspections of materials / storage area to identify potential problems that may cause odorous emissions. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required. If required an Odour Management Plan to be in place, distributed and adhered to by site personnel.	Odorous emissions may be released from decaying materials. Raw materials used during the operation will be kept to a minimum. Due to the short time period for the operation it is expected that there is insufficient time for any raw materials to decompose / omit odours.	Complaints of odours / smells in vicinity of local receptors.	Not significant.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
007	Release of odour from site septic tanks and waste skips.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office).	Site location is within rural area where local receptors are very few. Tanks and pipework to be tested for leaks prior to delivery as identified by manufacturer and industry standards. Breaking containment of tanks and pipework systems is to be kept to a minimum. Tanks and pipework to be cleaned where possible prior to breaking containment. Tanks and skips to be self-contained / enclosed to prevent emissions. Skips to be clearly marked to ensure that waste is kept segregated and cross contamination does not occur. Tanks checked prior to use to ensure complete integrity. Tanks and skips to be monitored and emptied daily / as required. Regular maintenance and inspections are to be conducted as directed by written procedures. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required. If required an Odour Management Plan to be in place, distributed and adhered to by site personnel.	Odorous emissions may be released during disassembling of the pipework and tanks. Breaking containment of tanks / pipework will be kept to a minimum – at end of operations or essential maintenance work only. Breaking of containment expected to be at end of operations only. Odorous emissions may be released from breakdown of refuse in skips if left over a period of time. Skips will be monitored and emptied frequently to remove the possibility of odorous emissions occurring. Septic tank pump-out will cause vent to atmosphere from suction tanker for short durations (<30mins). This is a temporary low velocity and low volume emission.	Complaints of odours / smells in vicinity of local receptors. Will not last for more than 30 minutes.	Not significant.

Assessment of Noise and Vibration Risks

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
001	Noise and vibration from transportation vehicles accessing and egressing site. Noise from vehicle engines and generators on site. Noise from vehicle reversing alarms. Noise from loading and unloading of vehicles.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Atmosphere and ground vibrations.	Site location is within rural area where local receptors are very few. Noise limits set by the planning authority shall not be breached. Transport restrictions set by the planning authority shall not be breached. Vehicle loads and transportation to be planned to reduce quantity of deliveries / collections. Directional / white noise reversing alarms are to be fitted to site vehicles. Loading / unloading operations will be planned where possible during day light hours. Noise monitoring to be conducted prior to and during operations. Sound screens to be erected if required from sound survey results. Trained operators to load / unload vehicles using MHE plant equipment. Equipment when not in use to be switched off. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat.. Records will be kept of complaints and action taken to resolve complaints if required.	Vehicle movements will be limited in compliance with planning authority conditions.	Complaints of noise in vicinity of local receptors. Duration of planned operations is temporary. Due to location, noise levels may increase for the duration of operations.	Low if management techniques are effective.
002	Noise from drilling operations. Includes noise levels from drilling rig, site plant equipment, generators and movement of equipment around site. Vibration from drilling operation and site vehicles.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Atmosphere and ground vibrations.	Site location is within rural area where local receptors are very few. Noise limits set by the planning authority shall not be breached. Vehicles / equipment are to be serviced and maintained to manufacturer's / industry standards. Vehicle reversing alarms are to be directional / white noise. Loading / unloading operations will be planned where possible during day light hours. Trained operators to load / unload vehicles using MHE plant equipment. Equipment when not in use to be switched off. Noise monitoring to be conducted during operations. Sound screens to be erected if required from sound survey results. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required.	Drilling and production phase – 24 hour operation – noise and vibration may occasionally reach local inhabitants.	Complaints of noise in vicinity of local receptors. Duration of planned operations is temporary. Due to rural location, noise levels may increase for the duration of operations.	Low if management techniques are effective.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
003	Noise from flaring.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Atmosphere.	Site location is within rural area where local receptors are very few. Flare unit to be constructed and tested in accordance with manufacturer's / industry standards. Regular maintenance and inspections are to be conducted as directed by written procedures. Noise output of flare unit known, and fed into noise assessment submitted with Planning Application Flare unit to be monitored and controlled at all times. Perimeter safe zone established around flare unit. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required.	During production and short term well operations noise will be produced from the flaring of gases. Noise generated will depend on the volume of subsurface gases released from the formation.	Complaints of noise in vicinity of local receptors.	Low.

Assessment of Fugitive Emissions Risks

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
001	Emissions to Air. Methane emissions from the wellbore and mud circulation.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – vapours carried on the wind.	Site location is within rural area where local receptors are very few. The well is constructed to industry standards / best available techniques and reviewed by independent well examiner. Adequate mud weight / suspension fluid weight, well control equipment and procedures in place. Competent Site Supervisor who holds a certified in date well control certificate is to be present during operations. Use of competent drilling fluids / suspension fluids management personnel. Cementing best practices utilised. Training on environmental awareness and emergency procedures for site personnel. Emergency procedures tested prior to commencement of operations and on a regular basis thereafter. Safe working procedures are documented and widely known by site personnel.	Methane emissions from the wellbore could reach receptors but management reactions, well control and emergency shutdown procedures should prevent this from occurring. Methane emissions from the mud circulation system are monitored constantly and if detected on site procedures should prevent the release of methane.	Potential for methane to be dispersed beyond the site perimeter.	Low if management techniques, monitoring, well control and emergency shutdown procedures are followed.
002	Emissions to Air. VOC's from vehicles and site equipment exhaust systems. Fume emissions from chemicals used during operations.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – vapours carried on the wind.	Site location is within rural area where local receptors are very few. Vehicle loads and transportation to be planned to reduce quantity of deliveries / collections. Vehicles are to be serviced and maintained to manufacturer's / industry standards. Regular maintenance and inspections are to be conducted as directed by written procedures. Training on environmental awareness for site personnel. Chemicals are to be stored correctly on site and containers sealed / closed when not in use. Competent personnel only to store / use chemicals. Equipment when not in use to be switched off. Adequate and suitable spillage kits to be available on site / transport vehicles. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required.	Emissions from vehicles and site equipment exhaust systems will occur throughout the operation. Emissions from chemicals will be minor and infrequent.	Complaints of odours / smells in vicinity of local receptors.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
003	Emissions to Air. VOC's from tanks / pipework.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – vapours carried on the wind.	Site location is within rural area where local receptors are very few. Tanks and pipework to be tested for leaks as required by written procedures. Storage tank system linked to single co-joined vent line to one emission point, through flowmeter to quantify flows Breaking containment of tanks and pipework systems is to be kept to a minimum. Tanks and pipework to be cleaned where possible prior to breaking containment. Regular maintenance and inspections are to be conducted as directed by written procedures. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required.	Emissions may be released during breaking containment of the tanks / pipework. Breaking containment of tanks / pipework will be kept to a minimum – at end of operations or essential maintenance work only. Breaking of containment expected to be at end of operations only.	Potential for complaints although VOCs are non-odorous.	Low if management techniques, planning and procedures are followed.
004	Emissions to Air. Dust and mud generated by vehicles accessing / egressing and traversing the site.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – dust carried by the wind to local receptors.	Site location is within rural area where local receptors are very few. Operations to be planned / designed to minimise transport and handling operations. Only one point of access from the public highway is to be constructed to manage vehicle access and control of mud deposits / dust suppression. Vehicles are to drive on approved roads and follow site traffic management system. Roads to / from the site are monitored for mud deposits. A road sweeping contractor will be arranged for road cleaning if required. Avoid certain activities that may present dust if high winds occur. Daily monitoring of wind / weather forecasts. Planting of grass, trees or hydro-seeding to assist in the suppression of dust generated from site bunds and open areas. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required.	Dust could potentially reach local receptors during strong winds which it could perhaps for 25 days a year. Management actions and site procedures should prevent this happening.	Nuisance – dust on cars, clothing, properties etc. Nuisance – mud on local highway.	Low if management techniques, planning and procedures are followed.
005	Litter. Litter generated on site.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – litter carried by the wind to local receptors.	Litter fences to be erected around site. Provide adequate suitable refuse receptacles for both inside and outside working areas. Training on environmental awareness and site waste management for site personnel. Litter to be cleared at end of each day / shift. Skips to be monitored and removed / emptied when required by authorised contractor. Site inspection process.	Litter could potentially reach local receptors during strong winds which it could perhaps for 25 days a year. Management actions and site procedures should prevent this happening.	Nuisance – Litter from site may be blown to local receptors. Complaints from local residents if appropriate techniques are not adopted and maintained.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
006	Emissions to Water. Run off from site operations.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Flow by gravity.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch was correctly installed during the construction of the wellsite. The impermeable membrane ensures that contamination that may occur from accidents on the site surface does not percolate to the subsurface below the site. Water from surface run off is collected in the site perimeter ditch and can be used in site operations or tested for contamination prior to being removed from site for onward disposal to an authorised licenced facility, which may include permitted reinjection wells by an authorised licenced waste carrier or via installed Class 1 Separator. Site perimeter ditches are monitored and procedures are in place to remove excess surface run off water as required. Checks of the impermeable membrane are conducted periodically to ensure that complete containment of the site perimeter ditch is maintained. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required.	Unchecked, ditches could overflow and run-off could reach localised receptors but management actions should prevent this from happening.	Pollution of local surface or groundwater.	Low if management techniques, planning and procedures are followed.
007	Emissions to Water. Unauthorised discharge / failure of equipment from site oil-water separator.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Flow by gravity.	Surface Water Management Plan is to be in place prior to installation of oil-water separator. Authorised, trained and competent personnel only to undertake discharge to surface water operations. Access to oil-water separator and flow valves will be restricted to authorised personnel only. Oi-water separator and flow valves will be secured when not in use. Oil-water separator maintenance program to be conducted in accordance with manufacturers guidelines.	Management actions and site procedures should prevent this happening.	Pollution of local surface or groundwater.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
008	Pests. Flies from refuse accumulated on site. Rats / mice from surrounding area. Wasps accumulating around materials used during operations.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Airborne / ground transportation.	Refuse to be stored in enclosed skips / receptacles. Refuse to be monitored and removed when skips are full. Skips and refuse receptacles to be checked daily to ensure integrity. Food waste to be stored separately in enclosed skips and removed off site for disposal as required. Training on environmental awareness / housekeeping practices for site personnel. Sacks / containers to be monitored for leaks / spills. Identification of split sacks / damaged containers to be addressed immediately and contents repackaged / or used as a prioritised item. Daily monitoring of susceptible areas by Site Supervisor. Pest control techniques to be established and implemented by competent contract company, if required. Litter to be cleared at end of each day / shift. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required.	Wastes left unattended could result in problems off site. Sacks / containers damaged through handling / use can result in accumulation of pests and problems off site.	Potential for spreading of disease and adverse health impacts on vulnerable people.	Low if management techniques, planning and procedures are followed.

Assessment of Visible Plume Risks

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
001	Emissions to Air. Plume emissions from flaring operation.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Dispersion by wind.	Flare unit designed and constructed to industry standards / best available techniques. Flare unit and pipework to be operated and maintained to industry standards. Flare unit to be tested prior to operational use. A leak test will be undertaken for the flare and associated pipework prior to operation. Monitoring procedures established to include monitoring of the gas entering the flare. Flare unit will be monitored during its operation. Procedures established and communicated to operational personnel should the flow rate of gas exceed or fall below the flares flow range. Gas from the well is expected to be extracted using the natural pressure within the well. An Ecological report was conducted prior to operations to assess impact on local wildlife and habitat. Records will be kept of complaints and action taken to resolve complaints if required.	Regular observations over periods of flaring.	Nuisance – reduced Low visibility. Due to rural location of site, impact on main travel routes and sensitive receptors fairly low.	Low if management techniques, planning, BAT and procedures are followed.

Assessment of Possible Source of Accidents

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
001	Transferring substances. (e.g. loading or unloading vessels).	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Drip trays to be utilised. Site / vehicle spillage kits to be readily available. Spillages to be remediated immediately Trained operators to carry out loading / unloading operations. Specific areas identified for loading / unloading operations. Safe working procedures / toolbox talks to be conducted prior to operations commencing. Authorised personnel only to be in working area. Operation / task to be planned and communicated to site personnel. Training on environmental awareness for site personnel during site induction. Records will be kept of complaints and action taken to resolve complaints if required. Emergency response plan established / tested.	Unchecked, ditches could overflow and run-off could reach localised receptors but management actions should prevent this from happening.	Pollution of local surface or groundwater.	Low if management techniques, planning and procedures are followed.
002	Plant or equipment failure.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground. Air – vapours carried on the wind.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Regular maintenance and inspections are to be conducted on plant and equipment as directed by the manufacturer / written procedures. Safety critical spares readily available. Competent trained personnel only to operate plant or equipment. Records will be kept of complaints and action taken to resolve complaints if required. Emergency response plan established / tested.	Management actions and site procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
003	Overfilling vessels.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground.	Storage tanks in constructed bund area. All tanks fitted with high-level devices linked to operating system – shuts down relevant operation to prevent overfilling. Testing of system as part of operating procedures An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Site spillage kits to be readily available. Spillages to be remediated immediately. Trained operators to carry out filling operations. Specific areas identified for filling operations. Safe working procedures / toolbox talks to be conducted prior to operations commencing. Authorised personnel only to be in working area. Operation / task to be planned and communicated. Training on environmental awareness for site personnel during site induction. Records will be kept of complaints and action taken to resolve complaints if required. Emergency response plan established / tested.	Unchecked, ditches could overflow and run-off could reach localised receptors but management actions should prevent this from happening.	Pollution of local surface or groundwater.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
004	Containment failure. (e.g. over pressure of vessels and pipework).	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground. Air – vapours carried on the wind.	Pipework and valves installed to above maximum theoretical working pressure Management by pressure sensors and ESD's Integrity testing of tanks and pipework Pressure system checks An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Equipment / pipework to be tested prior to operational use. Checks of the impermeable membrane are conducted periodically to ensure that complete containment of the site is maintained. Regular maintenance and inspections are to be conducted as directed by written procedures. Competent trained personnel only to operate plant or equipment. Safe working procedures / toolbox talks to be conducted prior to operations commencing. Authorised personnel only to be in working area. Operation / task to be planned and communicated. Training on environmental awareness for site personnel during site induction. Records will be kept of complaints and action taken to resolve complaints if required. Emergency response plan established / tested.	Management actions and procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
005	Making the wrong connection in drains or other systems.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground. Air – vapours and carried on the wind.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Competent trained personnel only to connect pipework, equipment, engineering systems. Safe working procedures / toolbox talks to be conducted prior to operations commencing. Equipment / pipework to be tested prior to commencement of operations. Authorised personnel only to be in working area. Operation / task to be planned and communicated to all personnel involved in the operation. Permit to Work System to be utilised for work associated with pressure systems, work deemed high risk. Emergency response plan established / tested.	Management actions and procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.
006	Poor storage arrangements of hazardous substances.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground. Air – vapours and plumes carried on the wind.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Hazardous substances to be stored in dedicated areas. COSHH Assessments in place for hazardous items. Personnel to be trained in safe handling / use of hazardous items (COSHH Awareness etc.). COSHH items to be segregated in line with current regulations. Material Safety Data Sheets (MSDS) to be readily available for each hazardous item. Copy of MSDS and a list and location of hazardous substances to be made available to the Fire & Rescue Service and copy held on site as part of Emergency Response Plan. Emergency response plan established / tested.	Management actions and procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
007	Fires or failure to contain fire water.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground. Air – vapours and plumes carried on the wind.	Fire risk assessment to be conducted by HSE Manager. Fire awareness training / site induction for personnel, plus Site Rules Waste management and housekeeping procedures established and communicated. No sources of ignition are allowed on working pad of the site unless authorised and permit to work is in place. Hazardous materials stored appropriately Smoking area is established outside of the working pad. Fire points, extinguishers and a fire water tank located around the site. Fire trained personnel to be available throughout the operation. Fire evacuation and test to be conducted prior to and during the operation. AFFF foam to be available on site for use in firefighting. Local Fire & Rescue Service to be notified of operations. A review / visit of the site may be undertaken by the Fire & Rescue Service and emergency response plans and actions discussed and agreed. Copy of MSDS and a list and location of hazardous substances, firefighting equipment, spillage kits water tank to be made available to the Fire & Rescue Service and copy held onsite as part of Emergency Response Plan. Containment of fire water / AFFF foam used in the event of firefighting measures will be contained within the site / perimeter ditch and removed by specialised contractor. Emergency response plan both on and off site established / tested. Emergency telephone number located on information board at site entrance. The site is not in a Flood Risk Area.	Management actions and procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
008	Incompatible substances coming into contact.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground. Air – vapours and plumes carried on the wind.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Segregation of incompatible substances. Hazardous substances to be stored in appropriately on site in accordance with current regulations. COSHH Assessments in place for hazardous items. Personnel to be trained in safe handling / use of hazardous items (COSHH Awareness etc.). COSHH items to be segregated in line with current regulations. Material Safety Data Sheets (MSDS) to be readily available for each hazardous item. Copy of MSDS and a list and location of hazardous substances to be made available to the Fire & Rescue Service and copy held onsite as part of Emergency Response Plan. Emergency response plan established / tested.	Management actions and procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.
009	Unwanted reactions and/or runaway reactions.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground. Air – vapours and plumes carried on the wind.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Emergency shutdown procedures to be established and tested prior to and during operations. Competent trained personnel to conduct operations. Safe working procedures / toolbox talks to be conducted prior to operations commencing. Operation / task to be planned and communicated. Training on environmental awareness for site personnel during site induction. Emergency response plan established / tested.	Management actions and procedures, with use of QA and applicable standards will prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
010	Emission of an effluent before adequately checking its composition.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Cracks or splits in poor impermeable membrane and through the ground. Air – vapours and plumes carried on the wind.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Competent trained personnel to conduct operations. Safe working procedures / toolbox talks to be conducted prior to operations commencing. Operation / task to be planned and communicated. Substance to be tested prior to removal from site or at licenced waste facility by competent trained personnel. Emergency response plan established / tested.	Management actions and procedures will prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.
011	Vandalism.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Various – acts of vandalism may cause fires, loss of containment from containers, damage to site equipment, etc.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Site security risk assessment to be conducted prior to operations commencing. Security fence to be established around site perimeter. Security officers from specialist security company to be contracted to provide 24 hour security during operations. Security procedures established and communicated to Site Security Officers to cover unauthorised access, vandalism, protestors, theft, emergency response actions etc. Site alarm system will include linkage to security response team Site personnel to be aware of possible unauthorised personnel on site and the actions to take if such personnel discovered. When not in use, equipment is to be shut down and isolated. Hazardous materials are to be stored in locked COSHH store, if applicable, when not in use. Emergency communications to be established between operational personnel and site security. Emergency response plan both on and off site established / tested. .	Management actions and procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
012	Flooding.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Spreading of materials outside of site boundary. Damage to site equipment from the effects of flooding.	A hydrogeological risk assessment has been conducted by an independent company.	None.	None.	None.
013	Spillage from haulage vehicles and plant equipment.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Via water surface drainage system. Cracks or splits in poor impermeable membrane and through the ground. Air – vapours and plumes carried on the wind.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Vehicles to be serviced and maintained to manufacturer's / industry standards. Regular maintenance and inspections are to be conducted as directed by written procedures. Drivers are to receive site rules Drip trays to be utilised. Site / vehicle spillage kits to be readily available. Spillages to be remediated immediately. Training on environmental awareness for site personnel during site induction. Record and investigate complaints, pollution incidents or breaches of permit conditions and the actions taken to rectify complaints and prevent further occurrences. Emergency response plan established / tested.	Management actions and procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.
014	Accidents resulting from operations carried out without a structured management system in place.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Via water surface drainage system. Cracks or splits in poor impermeable membrane and through the ground. Air – vapours and plumes carried on the wind.	Structured management system in place, distributed and adhered to by personnel involved in operations.	Management actions and procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
015	Leaks from vehicle fluids resulting from vehicle accidents.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Via water surface drainage system. Cracks or splits in poor impermeable membrane and through the ground. Air – vapours and plumes carried on the wind.	An impermeable membrane over the whole of the working pad area and under the site perimeter ditch correctly installed during construction of the wellsite. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Vehicles to be serviced and maintained to manufacturer's / industry standards. Regular maintenance and inspections to be conducted as directed by the manufacturer / written procedures. Drivers are to receive training / induction on driving techniques and site rules Drip trays to be utilised. Site / vehicle spillage kits to be readily available. Spillages to be remediated immediately using vacuum cleaners / pumps and not to be washed down where possible. Training on environmental awareness for site personnel. Personnel to receive site induction. Record and investigate complaints, pollution incidents or breaches of permit conditions and the actions taken to rectify complaints and prevent further occurrences. Emergency response plan established / tested	Management actions and procedures should prevent this happening.	Pollution of local surface or groundwater. Emissions to air.	Low if management techniques, planning and procedures are followed.

Discharges to Surface Water Assessment

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
001	Overflow of site perimeter ditches.	**Watercourses**	Surface run-off / percolation into subsurface. Cracks or splits in poor impermeable membrane and through the ground. Field or roadside drainage ditches. Soaking into adjacent ground.	Water produced and/or used within the activity is re-used where possible within the operation for well control, cementing operations, and drilling operations. Waste water is contained within the site boundary via storage tanks. Surface run- off water is contained within the impermeable membrane and perimeter ditch catchment. Surface run-off water to be discharged to surface water through installed Class 1 Oil–water Separator. Liner condition (where exposed to sunlight) is regularly inspected. Damming points are identified to prevent migration should overflow occur.	Low – management controls and monitoring will prevent overspill.	Pollution of surface water, groundwater or land contamination.	Insignificant.
002	Discharge of contaminated water within the site perimeter ditch.	**Watercourses**	Discharge of contaminated water from faulty, poorly maintained or unserviceable Oil-water Separator. Damage and unauthorised discharge from acts of vandalism and/or unauthorised personnel.	Discharge operations are to be in accordance with the Environment Agency issued Wressle-1 environmental permit. Only water processed through the installed Class 1 Oil–water Separator is to be discharged. Only clean uncontaminated water is to be discharged to surface water. Isolation valves before and after unit Water containing hydrocarbons or with a pH range outside of the acceptable standard is to be classified as contaminated and a detailed analysis of the sample will be undertaken by an Environment Agency approved MCERTS laboratory. Contaminated water is to be removed from site using a licenced waste carrier and the waste is transported to a licenced waste facility for reuse / recycling or disposal. The Oil-water Separator is to be maintained and serviced in accordance with manufacturer's guidelines. Only competent personnel are to operate, maintain, repair or service the Oil-water Separator. Faults within the Oil-water Separator are to be reported to Senior Management. Discharge operations are to cease if faults occur within the Oil-water Separator or there is a requirement for servicing or maintenance. Access to the Oil-water Separator is controlled. Specialised tools and equipment are required to operate the Oil-water Separator.	Low – processing water through the Oil-water Separator and analysing of water prior to discharge will ensure that contaminated water is not discharged. Management controls for the operation, maintenance, servicing and repair of the Oil-water Separator will prevent discharge of contaminated water. Controlled access and security of tools and equipment will prevent unauthorised access and vandalism.	Pollution of surface water, groundwater or land contamination.	Insignificant.

Assessment of Air Emission Risks

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
001	Greenhouse gas emissions from site power generation.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	Power generation is provided by drilling rig generators and / or standalone generators. Generators are operated on gas oil supplied from external bunded fuel tanks. During drilling and production operations, the generators may be operated for 24 hours per day. This will be dependent upon power demand and operational activities. Generators are maintained and serviced in line with manufacturer's guidelines thus ensuring that they operate efficiently and minimising emissions, noise and vibration. Service and maintenance regimes are implemented and adhered to and all work is carried out by a competent trained electrician / mechanic. Generators supplied within the rig structure respond to power demand and the working load and output varies during the operations being conducted. When power is not required generators are switched off to reduce emissions, fuel usage, noise, vibration and wear and tear on the equipment.	Air quality not significantly affected. Make regular observations over the period of operation.	Impact on global warming but deemed insignificant.	Insignificant.
002	Greenhouse gas emissions from flaring of natural gas during production and well testing operations.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	In the event that natural gas is encountered during production operation and well testing operations, it will be flowed to surface through the wellbore into fluid separation equipment, from which the petroleum is separated from produced fluids (formation water). Once separated, the gas is diverted via pipework to an enclosed flare for incineration.	Air quality not significantly affected from modelling assessment. Make regular observations over the period of operation.	Impact on global warming but deemed insignificant.	Insignificant.
003	Greenhouse gas emissions from vehicles and site equipment during well testing/ production operations.	**Local Residents** **Watercourses** **Site of Specific Scientific Interest (SSSI)** **Special Protection Areas** **Ramsar Sites**	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	Vehicle loads and transportation to be planned to reduce quantity of deliveries / collections. Vehicles are to be serviced and maintained to manufacturer's / industry standards. Regular maintenance and inspections are to be conducted as directed by written procedures. Vehicles when not in use to be switched off. Ambient air quality monitoring may be undertaken to establish Ambient air quality baseline and during flaring activities.	Emissions from vehicles and site equipment exhaust systems will occur throughout the operation.	Impact on global warming but deemed insignificant.	Insignificant.

Assessment of Disposal or Recovery of Waste Produced on Site Risks

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
001	Well Suspension Brine.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Waste Facility.	Well suspension brine will return to surface where it will be stored in steel open top tanks for subsequent reuse or offsite disposal to a licenced waste facility. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination. All tanks, skips and storage containers will be checked for integrity by the Site Supervisor or HSE Manager.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
002	Oil Based Rock Cuttings.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Waste Facility.	Wastes transported within the drilling mud are removed at surface and the drilling mud is reused and replaced back into the wellbore using a closed loop system. The closed loop system reduces the amount of drilling mud used during the operation. Drilling muds (when redundant) and waste are removed from the borehole and stored in an open tank (10.45m x 3.05m x 3.05m) at surface and removed from site by a licenced waste carrier to a licenced waste facility. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority /client. An audit of the Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transport of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
003	Oil Based Drilling Muds	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.
004	Flowback Fluid	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
005	Proppant Fluid (retained).	Groundwater.	Natural fractures within the formation.	Immediately following the proppant squeeze, it is anticipated that a maximum of 70% of the total fluids pumped will remain within the formation. The proppant squeeze fluid will consist of water and proppant and small amounts of additives. The retained proppant squeeze fluid will remain within the formation indefinitely. A scheme of surface and groundwater monitoring shall take place after the proppant squeeze process. Retained proppant squeeze fluid shall remain within the formation as the permeability of the formation is poor, thus the need to increase permeability from the formation to the wellbore. A pathway to groundwater from the formation is not expected due to the poor permeability of the formation, and the integrity of the wellbore.	Management actions and procedures should prevent this happening. If exposure was to occur, it is expected to have minimal consequences due to the makeup of the fluid.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.
006	Proppant Fluid (returned).	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Immediately following the proppant squeeze, it is anticipated that up to 30% of the total fluids pumped will return to surface. The fluid is expected to contain very little of the proppant. The proppant squeeze fluid will consist of water and proppant and small amounts of additives. The returning fluid is transferred on surface to storage tanks for subsequent reuse. The returning fluid associated with the proppant squeeze is transferred on surface to storage tanks for subsequent offsite disposal via a licenced waste facility, which may include reinjection wells. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. A Site Supervisor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Pipeline integrity checks will be carried out. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturer's / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination. All tanks, skips and storage containers will be checked for integrity by the Site Supervisor or	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

				HSE Manager.			
ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
007	Proppant (sand)	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Immediately following the proppant squeeze, it is anticipated that up to 30% of the total fluids pumped will return to surface. The fluid is expected to contain very little of the proppant. The proppant is transferred on surface to storage tanks for subsequent reuse. The returning fluid associated with the proppant squeeze is transferred on surface to storage tanks for subsequent offsite disposal via a licenced waste facility. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. A Site Supervisor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Pipeline integrity checks will be carried out. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturer's / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination. All tanks, skips and storage containers will be checked for integrity by the Site Supervisor or HSE Manager.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
008	Cement from Cementing Operations.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Cement returns are anticipated at surface during drilling operations, maintenance and abandonment operations. It is not possible to reuse cement that returns to surface and, therefore, the cement will be stored on site in a skip (3.75m x 1.75m x 1.26m) for subsequent offsite disposal to a licenced waste facility. Cement waste is classed as non-hazardous. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
009	Spent Acid	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Acid is used during well clean up (treatment) operations. The acid is used to expand existing channels within the rock formation to aid petroleum products to flow to surface. Acid used during well clean up (treatment) operations will be reverse circulated to surface where it is stored in tanks (1m^3 IBC's) for subsequent offsite disposal to a licenced waste facility. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
010	Run-off Water from Site Surface.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	The wellsite design incorporates a Bentomat impermeable membrane, which does not permit surface water to penetrate the underlying subsoil's. Surface water percolates through the site stone and migrates along the surface of the impermeable membrane and into a containment ditch for subsequent reuse, discharge via a Class-1 Interceptor or offsite disposal to a licenced waste facility, which may include permitted reinjection wells. Surface water is mainly rainfall (precipitation), however, the impermeable membrane exists to protect against pollution from oil spillages and, therefore, has the potential to contain oils. Arrangements are made for the water within the ditch to be discharged to surface water via a Class 1 Interceptor or transferred to a road haulage tanker for subsequent offsite disposal via a licenced waste facility during periods of operations, which may include permitted reinjection wells. If signs of contamination are present within the water, attempts at site will be made to remove the contamination (i.e. use of hydro-sorb pads to remove oil contamination) and tests will be conducted at site or the licenced waste facility to identify the best route to be undertaken for recycling. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier is to be undertaken prior to operations commencing. A physical audit of the transportation of waste is to be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
011	Accommodation Waste Water and Sewage.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Waste water and foul waste is generated on site in the accommodation units. Waste water and foul waste is collected using independent under cabin storage tanks where it is stored for subsequent offsite disposal to a licenced waste facility. Levels of waste within the tanks are monitored daily and arrangements are made for the removal and off-site disposal of waste when the level of waste is near capacity of the tanks. A licenced waste contractor will be onsite during certain operations to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures will prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
012	Fuel Oil Spill from Power Generation.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Although the site is sealed using Bentomat membrane, oil and oily waste is stored and handled as though it were not. This gives an additional layer of protection. The expected quantity of waste fuel oil is expected to be approximately 0.1 tonne. A licenced waste contractor will be onsite during the drilling operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
013	Engine, Gear and Lubricating Oils from Mobile Plant.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Low volumes of engine oils, gear oils and lubricating oils are used to service the rig and associated equipment. Oils will be stored on bunded trays. Waste oils will be collected and stored on site within bunded trays for subsequent offsite recycling or disposal via a licenced waste facility. Although the site is sealed using Bentomat membrane, oil and oily waste is stored and handled as though it were not. This gives an additional layer of protection. A licenced waste contractor will be onsite during the drilling operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
014	Hydraulic Oils from Mobile Plant.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Low volumes of Hydraulic oils are used to service the rig and associated equipment. Oils will be stored on bunded trays. Waste oils will be collected and stored on site within bunded trays for subsequent offsite recycling or disposal via a licenced waste facility. The expected quantity of waste hydraulic oils is expected to be approximately 1 tonne. Although the site is sealed using Bentomat membrane, oil and oily waste is stored and handled as though it were not. This gives an additional layer of protection. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures should prevent this happening.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
015	Oil Rags / Absorbents from Mobile Plant Maintenance.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Oil rags and absorbent materials used during plant maintenance and for spillages within the site will be stored on site in steel drums (209 litres) prior to disposal offsite by a licenced waste contractor. Oil rags and absorbent materials will be removed from site at the end of operations or when quantities held permit a practical economic and environmental operation. The expected quantity of waste oil rags and absorbents is expected to be approximately 1 tonne. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier is to be undertaken prior to operations commencing. A physical audit of the transportation of waste is to be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures will prevent exposure.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
016	Waste Filters from Mobile Plant Maintenance.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Waste oil filters from mobile plant maintenance will be stored on site in steel drums (209 litres) prior to disposal offsite by a licenced waste contractor. Waste oil filters will be removed from site at the end of operations or when quantities held permit a practical economic and environmental operation. A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier is to be undertaken prior to operations commencing. A physical audit of the transportation of waste is to be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures will prevent exposure.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
017	Paper and Cardboard from Office Routines.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Waste generated from the office accommodation units will be paper and cardboard and will be segregated and stored on site in skips for subsequent offsite recycling via a licenced waste facility. Use of enclosed skips will ensure that waste can be contained within the site boundary. The expected quantity of waste paper and cardboard is expected to be approximately 1 tonne. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste maybe undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures will prevent exposure.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.
018	Canteen Waste.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Canteen waste generated on site will be stored on site in closed skips for subsequent offsite disposal to a licenced waste facility. Canteen waste will comprise of food packaging, food waste, plastic containers, paper, cardboard etc. Use of enclosed skips will ensure that waste can be contained within the site boundary. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures will prevent exposure.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
019	Packaging from Delivered Products.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Wood used in the packaging of equipment, including pallets and dunnage, will be stored on site for subsequent reuse or offsite recycling via a licenced waste facility. Where possible, packaging used for transportation of goods will be returned to the manufacturing supplier with the delivery vehicle. Waste generated from packaging will be segregated and stored on site skips for subsequent offsite recycling via a licenced waste facility. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures will prevent exposure.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.
020	Metal from Engineering Works.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	Waste metal generated on site through minor engineering works and packaging will be stored on site for subsequent reuse or offsite recycling via a licenced waste facility. Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles. Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation. Vehicle spillage kits are to be carried during transportation of wastes. Vehicles are to adhere to approved traffic routes as outlined by planning authority / client. An audit of the nominated Licenced Waste Carrier may be undertaken prior to operations commencing. A physical audit of the transportation of waste may be undertaken to ensure that the waste is transported to the approved final destination.	Management actions and procedures will prevent exposure.	Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Low if management techniques, planning and procedures are followed.

Disposal or Recovery of Waste Produced on Site

Waste Stream No.	Description of Waste Stream	Amount produced tonne / year	Nature of Waste	Disposal or recovery option	Impact Score
001	Well Suspension Brine	25	Non-haz (2)	D9(12)	600
002	Oil Based Rock Cuttings	1	Hazardous (10)	R3 (3)	30
003	Oil Based Mud	1	Hazardous (10)	R3 (3)	30
004	Flowback Fluid	150	Hazardous (10)	R3 (3)	4500
006	Proppant Fluid (returned)	90	Non-haz (2)	D9 (12)	2160
005	Proppant Fluid (retained)	90	Non-haz (2)	D3 (17)	3060
007	Proppant (returned)	15	Non-haz (2)	R5(3)	90
008	Cement from Cementing Operations.	5	Non-haz (2)	R5(3)	30
009	Spent Hydrochloric Acid from Acid Wash and Squeeze Operations.	50	Non-haz (2)	R6 (4)	400
010a	Run-off Water from Site Surface.	800	Hazardous (10)	D4 (15)	120,000
010b	Run-off Water from Site Surface.	1,700	Non-haz (2)	D6 (15)	51,000
011	Accommodation Waste Water and Sewage.	1,000	Hazardous (10)	D4 (15)	150,000
012	Fuel Oil Spill from Power Generation.	0.1	Hazardous (10)	R9 (4)	4
013	Engine, Gear and Lubricating Oils from Mobile Plant.	2	Hazardous (10)	R9 (4)	80
014	Hydraulic Oils from Mobile Plant.	1	Hazardous (10)	R9 (4)	40
015	Oil Rags / Absorbents from Mobile Plant Maintenance.	1	Hazardous (10)	R9 (4) + R4 (4)	40
016	Waste Filters from Mobile Plant Maintenance	0.25	Hazardous (10)	R9 (4) + R4 (4)	10
017	Paper and Cardboard from Office routines.	3	Non-haz (2)	R5 (3)	18
018	Canteen Waste.	6	Non-haz (2)	R5 (3)	36
019	Packaging from Delivered Products.	6	Non-haz (2)	R5 (3)	36
020	Metal from Engineering Works.	8	Non-haz (2)	R4 (3)	48

Total = 332,212

Global Warming Potential

Serial No.	Activity	Substance	Chemical Formula	Atmospheric lifetime (yrs)	Global Warming Potential (GWP)	Direct / Indirect Release	Released Mass Per Operation (Tonnes)	Global Warming Potential of Emissions (Released Mass x GWP)
001	Power Generation	Carbon Dioxide	CO_2	Variable	1	Direct	749	749
002	Flaring	Carbon Dioxide	CO_2	Variable	1	Direct	2515	2515

Energy Sources, Conversion Efficiency and Emission Factors

Serial No.	Energy Source	Location of Emission	Delivered to Primary Conversion Factor	CO_2 Factor (t/mwh, primary)
001	Gas Oil	Direct	1	0.250

Energy Emission Factors

Serial No.	Fuel	MWh	Delivered to Primary Conversion Factor	t/MWh	Carbon Dioxide Emissions (MWh x Delivered to Primary Conversion Factor x t/MWh)
001	Gas Oil	26,280	1	0.250	26280 X 1 x 0.250 = 6,570,000 Kg of Carbon Dioxide emissions.

Assessment of Global Warming Risks

ID	Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
001	Greenhouse gas emissions from site power generation.	Atmosphere.	Air.	Power generation is provided on site by drilling rig generators and / or standalone generators. Generators are powered / operated using gas oil supplied from external bunded fuel tanks located within the site boundary. During drilling operations, the generators are usually operated 24 hours per day, thus ensuring power supply is not interrupted and the safety systems required on site ensure that the integrity and safety of the wellbore is maintained. Generators are maintained and serviced in line with manufacturer's guidelines thus ensuring that they operate efficiently and minimising emissions, noise and vibration. Service and maintenance regimes are implemented and adhered to and all work is carried out by a competent trained electrician. Generators supplied within the rig structure respond to power demand and do not run at full working load during the operations. When power is not required generators are switched off / on standby to reduce emissions, fuel usage, noise, vibration and wear and tear on the equipment.	Greenhouse gas emissions are released during operation of site generators.	Global warming and effects associated with it.	Not significant.
002	Greenhouse gas emissions from flaring of natural gas during well testing and production operations.	Atmosphere.	Air.	In the event that natural gas is encountered during the well testing and production operation, it will be flowed to surface through the wellbore into fluid separation equipment, from which the petroleum is separated from produced fluids (formation water). Once separated, the gas is diverted via pipework to a ground flare for incineration.	Air quality not significantly affected from modelling assessment. Make regular observations over the period of operation.	Impact on global warming but deemed insignificant from modelling assessment.	Not significant.
003	Greenhouse gas emissions from vehicles and site equipment during drilling / production.	Atmosphere.	Air – Prevailing winds from south west (average statistics from the Met Office).	Vehicle loads and transportation to be planned to reduce quantity of deliveries / collections. Vehicles are to be serviced and maintained to manufacturer's / industry standards. Regular maintenance and inspections are to be conducted as directed by written procedures. Drivers are to receive training / induction on driving techniques and site rules. Vehicles when not in use to be switched off. Ambient air quality monitoring will be undertaken to establish Ambient air quality baseline and during flaring activities. .	Emissions from vehicles and site equipment exhaust systems will occur throughout the operation.	Impact on global warming but deemed insignificant.	Insignificant.

OPRA Assessment

Wressle Wellsite

Wressle-1

Hydrocarbon Production and Short Duration Well Operations, including Near Wellbore Treatments and Proppant Squeeze Operations

3rd June 2016

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Operational Risk Appraisal (Opra) for Installations under EPR

Organisation Name	Egdon Resources UK Limited

Case Number	

Version	3.9

Opra Scheme Version 3.9

Full instructions for the use of this spreadsheet are contained in the accompanying documentation.
It is recommended that the user fills in the spreadsheet following the order of worksheets listed below (click on the appropriate tab at the bottom of the screen).
Not all worksheets require input, for those that do, the fields that may require input have no background colour.
The sequence of worksheets is divided into two sections Sheets 1 to 11 are concerned with the input of data. Sheet 12 is the summary for the Opra Scores and Sheet 13 displays the charges.
If you cannot see the whole of this box or it is very small, please click 'View' and adjust 'Zoom' level.

1 Listed Activities
Please refer to the Opra Scheme for Installations for the look-up tables and guidance.
Use abbreviated descriptions, select the Schedule 1 references and bands from the pick lists provided.

2 Other Activities
Please enter Part A(2), Part B and aggregated activities onto this sheet.

3 Complexities
Summary of complexities and rules applied

4 Emissions to Air

5 Emissions to Water

6 Emissions to Land

7 Emissions to Sewer

8 Emissions to Waste

9 Emissions Summary
No input is required. Output screen only. Summary of emissions.

10 Location

11 Operational Management

12 Opra Summary
No input is required. Output screen only. The emissions are shown separately.

13 Calculation
No input is required. Charges with separate emissions totals. It is possible to clear the scores and recalculate the charges to include any amendments.

For queries about the scheme or the operation of the spreadsheet, please contact the Environment Agency by email: opra@environment-agency.gov.uk

For EA Use

☐ Consolidated Permit

Listed Activities - Complexity Attribute

Organisation:	Egdon Resources UK Limited
Case Number:	0

	Description of Activity	Schedule 1 Reference	Regulatory Complexity
1	Storage of Crude Oil	1.2 Part A (1) h) (A)	B
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Totals before any rules are applied	
A	0
B	1
C	0
D	0
E	0

If there is insufficient space please attach a paper record

If Rule 4 applies - please complete Other Activities sheet

Aggregation and Schedule1 Part A(2) and Part B Activities

Organisation Name:	Egdon Resources UK Limited
Case Number:	0

If there is insufficient space please attach a paper record

Schedule 1 Part A(1) - Rule 4 Aggregation Details

	Aggregation Group	Description	Schedule 1 Ref	Complexity
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

Rule 4	**Not Applied**

List of Schedule 1 Part (A) 2 and Part B Activities included in the Installation

	Enter description of Activity	Schedule 1 Reference
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

EPR- Installations Charging Scheme Complexity - Application of Rules

Company	Egdon Resources UK Limited
Permit	0

	Description / Aggregation Group	Schedule 1 Ref	Complexity	Rule 3 Capping	Rule 5 not applied	Rule 6 not applied	Rule 7 Not Applied
1	Storage of Crude Oil	1.2 Part A (1) h) (A)	B	B	B	B	B
2							
3							
4							
5							
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27							
28							
29							
30							

Summary of Rules Applied	
Rule 3	No
Rule 4	No
Rule 5	No
Rule 6	No
Rule 7	No

These totals will be carried forward and used to calculate the Opra Risk Summary and Calculation of Charges

	Scores after Rules applied (Used for calculation of Charges)			Scores before rules applied (Used for summary of Risk)
Complexity	First 6 Complexities	Remaining complexities	Total	
A	0	0	0	0
B	1	0	1	1
C	0	0	0	0
D	0	0	0	0
E	0	0	0	0
Capped	0	0	0	

Emissions Attribute - Releases to Air

Organisation Name:	Egdon Resources UK Limited
Case Number:	0

Please check that the data is entered in the correct units.
The Emission Index will only show if the data entered exceeds the threshold.

Please tick box if this sheet is applicable ☐

Substance	Units	Emission Threshold	Maximum Quantity	Emission Index	Notes
Oxides of Sulphur	Tonnes Year	10		0	
Oxides of Nitrogen	Tonnes Year	10		0	
Carbon Monoxide	Tonnes Year	1000		0	
Beryllium	Kg year	1		0	
Cadmium	Kg year	1		0	
Lead	Kg year	1		0	
Mercury	Kg year	1		0	
Antimony	Kg year	10		0	
Arsenic	Kg year	10		0	
Chromium	Kg year	10		0	
Nickel	Kg year	10		0	
Selenium	Kg year	10		0	
Other Metals Specify					
	Kg year	100		0	
	Kg year	100		0	
	Kg year	100		0	
	Kg year	100		0	
	Kg year	100		0	
Organic Compounds					
Dioxins and Furans	mg TEQ year	0.1		0	
PCBs	mg TEF year	0.1		0	
PAHs as benzo(a)pyrene	Kg year	1		0	
Phosgene	Kg year	1		0	
Isocyanates	Kg year	1		0	
Di-ethyl sulphate	Kg year	1		0	
Di-methyl sulphate	Kg year	1		0	
Acrylonitrile	Kg year	10		0	
Aniline	Kg year	10		0	
Benzene	Kg year	10		0	
Benzyl Chloride	Kg year	10		0	
1-chloro-2,3-epoxypropane	Kg year	10		0	
Chloroform	Kg year	10		0	
Cyanamide	Kg year	10		0	
Ethylene oxide	Kg year	10		0	
Formaldehyde	Kg year	10		0	
Maleic anhydride	Kg year	10		0	
Nitrobenzene	Kg year	10		0	
Allyl alcohol	Kg year	10		0	
Acetaldehyde	Kg year	100		0	
Acetonitrile	Kg year	100		0	
Benzene-1,2,4-tricarboxylic acid,1,2-anhydride	Kg year	100		0	
1,3-butadiene	Kg year	100		0	
Chloroethene	Kg year	100		0	
1,2-dichloroethane	Kg year	100		0	
Dimethylformamide	Kg year	100		0	
1,4-dioxane	Kg year	100		0	
2-ethyoxyethanol	Kg year	100		0	
2-ethyoxyethylecetate	Kg year	100		0	
Ethyl acrylate	Kg year	100		0	
Iodomethane	Kg year	100		0	
Methylamine	Kg year	100		0	
2-nitropropane	Kg year	100		0	
Phenol	Kg year	100		0	

Propylene oxide	Kg year	100		0	
HFC's	Kg year	100		0	
HCFC's	Kg year	100	ons to Air	0	
PFC's	Kg year	100		0	
	Kg year				
Benzaldehyde	Kg year	500		0	
Benzo(a)pyrene	Kg year	500		0	
Butene	Kg year	500		0	
Chloromethane	Kg year	500		0	
1,4-dichlorobenzene	Kg year	500		0	
Dichloromethane	Kg year	500		0	
Ethyl toluene	Kg year	500		0	
Ethylene	Kg year	500		0	
i-butyraldehyde	Kg year	500		0	
Methyl bromide	Kg year	500		0	
Pentene	Kg year	500		0	
Propene	Kg year	500		0	
Styrene	Kg year	500		0	
Tetrachloroethane	Kg year	500		0	
Tetrachloroethene	Kg year	500		0	
Toluene diamine	Kg year	500		0	
1,1,1-trichloroethane	Kg year	500		0	
Trichloroethylene	Kg year	500		0	
Trichlorotoluene	Kg year	500		0	
Trimethylbenzene	Kg year	500		0	
Xylene	Kg year	500		0	
Other VOCs specify					
	Kg year	1000		0	
	Kg year	1000		0	
	Kg year	1000		0	
	Kg year	1000		0	
	Kg year	1000		0	
Inorganics					
Fluorine	Kg year	10		0	
Chlorine	Kg year	10		0	
Bromine	Kg year	10		0	
Iodine	Kg year	10		0	
Hydrogen Fluoride	Kg year	10		0	
Hydrogen Bromide	Kg year	10		0	
Hydrogen Iodide	Kg year	10		0	
Hydrogen Chloride	Kg year	1000		0	
Hydrogen Sulphide	Kg year	10		0	
Ammonia	Kg year	100		0	
Carbon Disulphide	Kg year	100		0	
Particulates	Kg year	100		0	
Other inorganic compounds specify					
Table A1 Substances	Kg year	0.1		0	
Table A2 Substances	Kg year	1		0	
Table A3 Substances	Kg year	10		0	
Table A4 Substances	Kg year	100		0	
Table A5 Substances	Kg year	1000		0	
Commercial in Confidence **If you need to use these entries please contact your local EA office**					
				0	
				0	
				0	
				0	
			Total	**0**	

Emissions Attribute - Releases to Water

Orgnisation Name:	Egdon Resources UK Limited	Please check that the data is entered in the correct units.
Case Number:	0	The Emission Index will only show if the data entered exceeds the threshold.

Please tick box if this sheet is applicable ☐

Substance	Units	Emission Threshold	Maximum Quantity	Emission Index	Notes
Aldrin	Kg year	0.001		0	
Azinphos-ethyl	Kg year	0.001		0	
DDT all isomers	Kg year	0.001		0	
Endosulfan	Kg year	0.001		0	
Endrin	Kg year	0.001		0	
Fenitrothion	Kg year	0.001		0	
Fenthion	Kg year	0.001		0	
Isodrin	Kg year	0.001		0	
Malathion	Kg year	0.001		0	
Parathion	Kg year	0.001		0	
Azinphos-methyl	Kg year	0.01		0	
Chlorfenvinphos	Kg year	0.01		0	
Diazinon	Kg year	0.01		0	
Dieldrin	Kg year	0.01		0	
Hexachlorobenzene	Kg year	0.01		0	
Hexachlorocyclohexanes	Kg year	0.01		0	
Hexachlorobutadiene	Kg year	0.01		0	
Mevinphos	Kg year	0.01		0	
Omethoate	Kg year	0.01		0	
Parathion methyl	Kg year	0.01		0	
Permethrin	Kg year	0.01		0	
Polychlorinated biphenyls	Kg year	0.01		0	
Triazophos	Kg year	0.01		0	
Tributyltin compounds	Kg year	0.01		0	
Trifluralin	Kg year	0.01		0	
Triphenyltin compounds	Kg year	0.01		0	
Atrazin	Kg year	0.1		0	
Pentachlorophenol and its compound	Kg year	0.1		0	
Simazine	Kg year	0.1		0	
Trichlorobenzene all isomers	Kg year	0.1		0	
	Kg year				
Benzene	Kg year	1		0	
Bentazone	Kg year	1		0	
Biphenyl	Kg year	1		0	
Carbon Tetrachloride	Kg year	1		0	
Chloroform	Kg year	1		0	
Chloronitrotoluenes	Kg year	1		0	
4-Chloro-3-Methylphenol	Kg year	1		0	
2-Chlorophenol	Kg year	1		0	
2,4 D non-ester	Kg year	1		0	
2,4 D ester	Kg year	1		0	
Demeton	Kg year	1		0	
1,2-Dichloroethane	Kg year	1		0	
Dimethoate	Kg year	1		0	
Linuron	Kg year	1		0	
Mecoprop	Kg year	1		0	
Napthalene	Kg year	1		0	
Tetrachloroethylene	Kg year	1		0	
1,1,1-Trichloroethane	Kg year	1		0	
1,1,2-Trichloroethane	Kg year	1		0	
Cadmium	Kg year	1		0	
Mercury	Kg year	1		0	
Nonylphenol Ethoxylate	Kg year	20		0	
Nonylphenols	Kg year	20		0	
Octylphenols	Kg year	20		0	
Toluene	Kg year	20		0	
Trichloroethylene	Kg year	20		0	
Xylenes	Kg year	20		0	
Arsenic	Kg year	20		0	
Chromium	Kg year	20		0	

Copper	Kg year	20		0	
Lead	Kg year	20		0	
Nickel	Kg year	20	ns to water	0	
Zinc	Kg year	20		0	
All consented substances not listed above specify					
Table W1 Substances	Kg year	0.01		0	
Table W2 Substances	Kg year	0.1		0	
Table W3 Substances	Kg year	1		0	
Table W4 Substances	Kg year	20		0	
Table W5 Substances	Kg year	100		0	
	Kg year			0	
	Kg year			0	
	Kg year			0	
Commercial in Confidence					
If you need to use these entries please contact your local EA office					
				0	
				0	
				0	
				0	
			Total	**0**	

Emissions Attribute Releases to Land

Organisation Name:	n Resources UK Limited
Case Number:	0

Please check that the data is entered in the correct units.
The Emission Index will only show if the data entered exceeds the threshold.

Please tick box if this sheet is applicable ☐

Substance/Landfill Type	Units	Emission Threshold	Maximum Quantity	Emission Index	Notes
Inert waste	Tonnes year	1000		0	
Non hazardous waste (non biodegradable)	Tonnes year	350		0	
Hazardous waste	Tonnes year	100		0	
Non hazardous waste (biodegradable)	Tonnes year	100		0	
			Total	**0**	

Emissions Attribute - Off-site Disposals to Sewer

Orgasination Name:	Egdon Resources UK Limited	Please check that the data is entered in the correct units.
Case number:	0	The Emission Index will only show if the data entered exceeds the threshold.

Please tick box if this sheet is applicable ☐

Substance	Units	Emission Threshold	Maximum Quantity	Emission Index	Notes
Aldrin	Kg year	0.001		0	
Azinphos-ethyl	Kg year	0.001		0	
DDT all isomers	Kg year	0.001		0	
Endosulfan	Kg year	0.001		0	
Endrin	Kg year	0.001		0	
Fenitrothion	Kg year	0.001		0	
Fenthion	Kg year	0.001		0	
Isodrin	Kg year	0.001		0	
Malathion	Kg year	0.001		0	
Parathion	Kg year	0.001		0	
	Kg year				
Azinphos-methyl	Kg year	0.01		0	
chlorfenvinphos	Kg year	0.01		0	
Diazinon	Kg year	0.01		0	
Dieldrin	Kg year	0.01		0	
Hexachlorobenzene	Kg year	0.01		0	
Hexachlorocyclohexanes	Kg year	0.01		0	
Hexachlorobutadiene	Kg year	0.01		0	
Mevinphos	Kg year	0.01		0	
Omethoate	Kg year	0.01		0	
Parathion methyl	Kg year	0.01		0	
Permethrin	Kg year	0.01		0	
Polychlorinated biphenyls	Kg year	0.01		0	
Triazophos	Kg year	0.01		0	
Tributyltin compounds	Kg year	0.01		0	
Trifluralin	Kg year	0.01		0	
Triphenyltin compounds	Kg year	0.01		0	
Atrazin	Kg year	0.1		0	
Pentachlorophenol and its compound	Kg year	0.1		0	
Simazine	Kg year	0.1		0	
Trichlorobenzene all isomers	Kg year	0.1		0	
Benzene	Kg year	1		0	
Bentazone	Kg year	1		0	
Biphenyl	Kg year	1		0	
Carbon Tetrachloride	Kg year	1		0	
Chloroform	Kg year	1		0	
Chloronitrotoluenes	Kg year	1		0	
4-Chloro-3-Methylphenol	Kg year	1		0	
2-Chlorophenol	Kg year	1		0	
2,4 D non-ester	Kg year	1		0	
2,4 D ester	Kg year	1		0	
Demeton	Kg year	1		0	
1,2-Dichloroethane	Kg year	1		0	
Dimethoate	Kg year	1		0	
Linuron	Kg year	1		0	
Mecoprop	Kg year	1		0	
Napthalene	Kg year	1		0	
Tetrachloroethylene	Kg year	1		0	
1,1,1-Trichloroethane	Kg year	1		0	
1,1,2-Trichloroethane	Kg year	1		0	
Cadmium	Kg year	1		0	
Mercury	Kg year	1		0	
Nonylphenol Ethoxylate	Kg year	20		0	
Nonylphenols	Kg year	20		0	
Octylphenols	Kg year	20		0	
Toluene	Kg year	20		0	
Trichloroethylene	Kg year	20		0	
Xylenes	Kg year	20		0	
Arsenic	Kg year	20		0	
Chromium	Kg year	20		0	
Copper	Kg year	20		0	
Lead	Kg year	20		0	
Nickel	Kg year	20		0	
Zinc	Kg year	20		0	
All consented substances not listed above specify					
Chemical Oxygen Demand	Kg year	10000		0	
Suspended Solids	Kg year	10000		0	
Table S1 Substances	Kg year	0.01		0	
Table S2 Substances	Kg year	0.1		0	
Table S3 Substances	Kg year	1		0	
Table S4 Substances	Kg year	20		0	
Table S5 Substances	Kg year	100		0	
	Kg year			0	
Commercial in Confidence					
If you need to use these entries please contact your local EA office					
				0	
				0	
				0	
				0	
		Total		0	
		Weighting Factor			(Weighting factor = 0.33)
		Weighted Total		**0**	

Emissions Attribute - Off-site Disposals of Waste

Organisation Name:	n Resources UK Limited
Case Number:	0

Please check that the data is entered in the correct units.
The Emission Index will only show if the data entered exceeds the threshold.

Substance	Units	Emission Threshold	Maximum Quantity	Emission Index	Notes
Inert waste	Tonnes year	1000		0	
Non hazardous waste (non biodegradable)	Tonnes year	350		0	
Hazardous waste	Tonnes year	100		0	
Non hazardous waste (biodegradable)	Tonnes year	100		0	
		Total		0	
		Weighting Factor			(Weighting factor = 0.33)
		Weighted Total		**0**	

Emissions Attribute - Off-site Recovery, Recycling, Re-use of Waste

Company	n Resources UK Limited
Permit	0

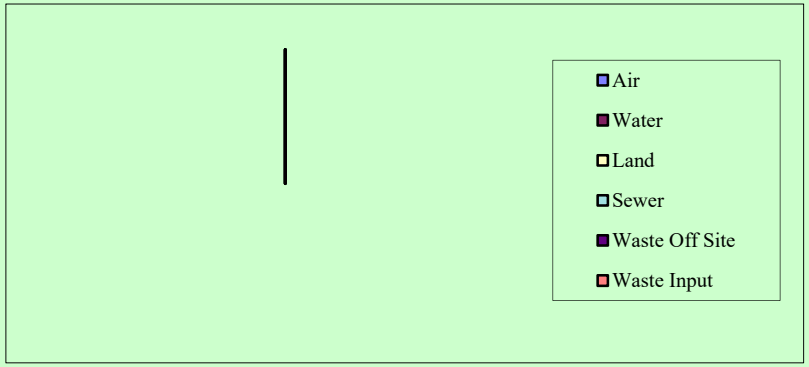
Please check that the data is entered in the correct units.
The Emission Index will only show if the data entered exceeds the threshold.

Substance	Units	Emission Threshold	Maximum Quantity	Emission Index	Notes
Inert waste	Tonnes year	1000		0	
Non hazardous waste (non biodegradable)	Tonnes year	350		0	
Hazardous waste	Tonnes year	100		0	
Non hazardous waste (biodegradable)	Tonnes year	100		0	
		Total		0	
		Weighting Factor			(Weighting factor = 0.1)
		Weighted Total		**0**	
		Off-Site Total		**0**	

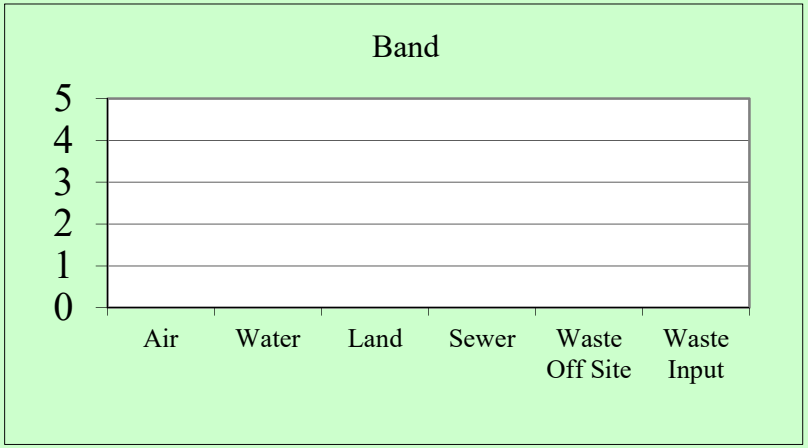
Emissions Attribute Summary Sheet

Organisation:	gdon Resources UK Limited
Case Number:	0

Pathway	**Overall Emission Index**
Air	0
Water	0
Land	0
Sewer	0
Waste Off Site	0
Waste Input	0



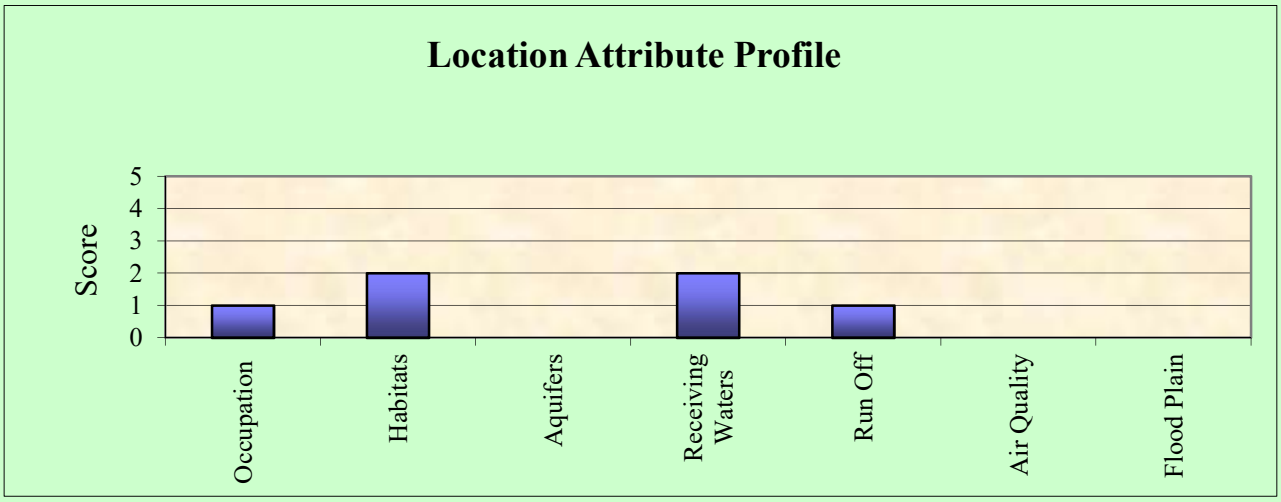
Pathway	**Band**	
Air	0	-
Water	0	-
Land	0	-
Sewer	0	-
Waste Off Site	0	-
Waste Input	0	-



Location Attribute

Organisation Name:	Egdon Resources UK Limited
Case Number:	0

Parameter	Yes/No	Available	Score
Human Occupation/Presence:			
a) if within 50m of the boundary	No	5	1
or:			
b) if greater than 50m but less than 250m of boundary	No	3	
or:			
c) if greater than 250m but less than 1km of boundary	Yes	1	
Statutory sites designated under Habitats Directive or CROW Act 2000:			2
a) if "relevant" under Habitats Directive	No	3	
or			
b) if CROW Act 2000 assessment required	Yes	2	
a) if on an aquifer and within a Groundwater Protection Zone	No	2	0
or			
b) if on an aquifer and not within a Groundwater Protection Zone	No	1	
Sensitivity of receiving waters (information available from Agency's "What's in your backyard" webpages), if:			2
a) grade 5	No	1	
b) river category grade 4 or 3	Yes	2	
c) river category grade 2 or 1 or estuarine	No	3	
a) If there is direct runoff from the site without interceptors or other active control measures	No	2	1
or			
b) If as above but there are interceptors or active control measures	Yes	1	
a) If within an Air Quality Management Zone (AQMZ) and emit pollutant that has been declared for that AQMZ	No	3	0
or			
b) If within 2km of an Air Quality Management Zone (AQMZ) and emit pollutant that has been declared for that AQMZ	No	2	
or			
c) as a) except do not emit pollutants that have be declared for the AQMZ	No	1	
If within a flood plain	No	2	0
Maximum Score = 20	**Total**		**6**
Band A = 0 - 4, B = 5 - 8, C = 9 - 12, D = 13 - 17 and E = 18 - 20	**Band**		**B**



Operator Performance

		Yes/No	Points available	Points scored	Post or group responsible for each requirement	Document reference (*) or date by which systems will be in place (*see para 4.4.2)
Operations and Maintenance section - 20%						
	Effective operational and prev maintenance systems shall be employed on all aspects of the process where any failure could impact on the environment.					
1	Are there documented operating procedures for operations that may have an adverse impact on the environment?	**Yes**	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager.	BSOR Document, Operations Programme, SMS, EMS, Method Statements
2	Is there a defined procedure for identifying, reviewing and prioritising items of plant for which a preventative maintenance regime is appropriate?	**Yes**	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager.	SMS, EMS, Contractors Maintenance Programme.
3	Are there documented procedures for monitoring emissions or impacts?	**Yes**	2.0	2.0	HSE & Production Manager	EMS, Waste Management Plan.
4	Is there a preventative maintenance programme for those items of plant whose failure could lead to impact on the environment?	**Yes**	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Rig Audit, Pre-use and daily checks. Environmental Audit.
5	Does the preventative maintenance programme include regular checks and formal inspections of 'static' items such as tanks, pipework, retaining walls, bunds and ducts?	**Yes**	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	SMS, Contractors Maintenance Programme.
6	Do the operations and maintenance systems include auditing environmental performance?	**Yes**	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager.	SMS, EMS, Contractors Maintenance Programme.
7	Are the reports, results and recommendations arising from audits made available to senior management on a regular basis?	**Yes**	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager.	Daily Reports, Site Audits.
8	In the last two years, has there been any notifiable incident or release for which lack of maintenance was a contributory cause ?	**No**	-2.0	0.0		
9	In the last two years, has there been any notifiable incident or release for which the root cause could not be identified?	**No**	-3.0	0.0		
	Operations and Maintenance Total		**12.0**	**12.0**	**100.0%**	**2.0**
Competence and Training - 20%						
	The Operator shall ensure that all relevant management and operational staff (including contractors and those responsible for purchasing equipment and materials) receive adequate training with regard to their responsibilities under the Permit. Particular attention should be given to the following: **- Minimisation of all potential environmental effects from operation under normal, abnormal, start up and shut down circumstances;** **- Prevention of accidental emissions and action to be taken when accidental emissions occur; and** **- The need to report deviation from the permit.**					
1	Has a training needs assessment been carried out which: - Identifies all posts for which specific environmental awareness training is required; and - Identifies the scope and level to which such training is to be given?	**Yes**	3.0	3.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Job Tender Process, BSOR, Contractors Training Matrix, Industry Guidance.
2	Are training systems in place for all relevant staff that cover the following factors:					
	- the regulatory requirements associated with the Permit as they affect their work activities and responsibilities;	**Yes**	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Job Tender Process, BSOR, Contractors Training Matrix, Industry Guidance.
	- likely potential environmental impacts which may be caused by plant under their control. This should cover both normal and abnormal circumstances;	**Yes**	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	BSOR, Contractors Training, Onsite Training.
	- reporting procedures to inform supervisors or managers of deviations from permit conditions;	**Yes**	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	
	- procedures to be used by supervisors or managers and for the reporting of deviations from permit conditions to the Agency; and	**Yes**	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	BSOR, EMS, SMS. 02/06/2016

Operator Performance

		Yes/No	Points available	Points scored	Post or group responsible for each requirement	Document reference (*) or date by which systems will be in place (*see para 4.4.2)
	prevention of accidental emissions and action to be taken when accidental emissions occur?	Yes	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Job Tender Process, BSOR, Contractors Training Matrix, Industry Guidance.
3	Are the skills and competencies necessary for key posts documented and are records of training needs and training received maintained?	Yes	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Job Tender Process, BSOR, Contractors Training Matrix, Industry Guidance.
4	Do the key posts include contractors, those responsible for liaising with contractors and those purchasing equipment and materials?	Yes	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Job Tender Process, BSOR, Contractors Training Matrix, Industry Guidance.
5	Do you assess the potential environmental risks posed by the work of contractors and provide instructions to contractors about protecting the environment while working on site?	Yes	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Job Tender Process, BSOR, Contractors Training Matrix, Industry Guidance.
6	In the last 2 years, have there been any notifiable incidents or releases, which it has been identified that lack of training was a contributory cause ?	No	-2.0	0.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	
7	Are there industry standards for training in this sector (e.g. WAMITAB) and if so do you apply them? (If no industry standards please leave blank)	Yes	-2.0	0.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Well Control Certificattions.
8	Are individual and organisational training needs reviewed on a regular (e.g. annual) basis?	Yes	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	SMS, Training Procedures.
	Competance Training Total		**17.0**	**17.0**		

Emergency planning - 20%

The Operator shall maintain an accident management plan which identifies potential events or failures which might lead to an environmental impact. The plan shall identify:

- **the likelihood of, and the actions to be taken to minimise, these potential occurrences;**
- **the environmental consequences and an action plan to deal with such occurrences;**
- **The Operator shall have a written procedure for handling, investigating, communicating and reporting of incidents and actual or potential non-compliance with permit conditions including taking action to mitigate any impacts caused and for initiating and completing corrective action.**
- **In the case of abnormal emissions the operator shall;**
  - **investigate and undertake remedial action immediately;**
  - **promptly record the events and actions taken; and**
  - **ensure the Regulator is made aware, as soon as practicable.**

1	Is there an accident plan that complies with guidance covering the following aspects of foreseeable scenarios: likelihood, consequences,actions to prevent, action to take in the event it occurs?	Yes	4.0	4.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Emergency Response Plan, BSOR.
2	Has the plan identified areas where improvement is needed?	Yes	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider	Emergency Response Plan, Audit.
3	Where improvement has been identified, does the plan include an implementation programme with acceptable timescales to the Agency? If not, 2 points will be deducted.	Yes	-2.0	0.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	Emergency Response Plan, Audit.
4	Are there written procedures for handling, investigating, communicating and reporting actual or potential non compliance with operating procedures or emission limits?	Yes	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	SMS,EMS, Accident & Incident Reporting Procedures.
5	Are there written procedures for handling, investigating, communicating and reporting environmental complaints?	Yes	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	SMS,EMS, Accident & Incident Reporting Procedures.
6	Are there written procedures for investigating incidents, (and near-misses) including identifying suitable corrective action and following up implementation of that action?	Yes	2.0	2.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	SMS,EMS, Accident & Incident Reporting Procedures.
7	In the last 2 years, have there been any notifiable incidents or releases for which it has been identified that lack of emergency planning was a contributory cause ?	No	-2.0	0.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	02/06/2016

Operator Performance

		Yes/No	Points available	Points scored	Post or group responsible for each requirement	Document reference (*) or date by which systems will be in place (*see para 4.4.2)
8	Are there audit records of investigations into non compliance, complaints and incidents? Does the audit cover follow up actions? Do the audit reports go to senior managers?	Yes	3.0	3.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	SMS,EMS, Action Log.
	Emergency planning Total		**12.0**	**12.0**		
Organisation - 40%						
	The following aspects of site management procedures and controls may not be in the permit conditions but are likely to have an impact on the Agency resources required to apply the Env Permitting Regulations.					
1	**Do you operate an externally audited environment management system, if so answer one of the following questions. N.B Please enter your Certificate Number, Name of certification body and their UKAS Registration Number in the space for document reference.**					
1.1	Is your Environmental Management System EMAS registered? If yes select Y and go to question 4.	No	20	0		
1.2	Is your Environmental Management System certified to ISO 14001? If yes enter Y and go to questions 3 and 4.	No	15	0		
1.3	Is your system an Environmental Mangement System subject to external audit through a third party audit programme with a published methodology (excludes in-house company audit programme). If yes enter and go to questions 3 and 4.	No	12	0		
	Sub Total		**Max 20**	**0.00**		
2	**If you do not operate an externally audited environmental management system then assess your system against the criteria below:**					
2.1	Has your company adopted an environmental policy and programme which :					
	□ includes a commitment to continual improvement and prevention of pollution?	Yes	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	
	□ includes a commitment to comply with relevant legislation, and with other requirements that the organisation subscribes to?	Yes	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	
	□ identifies, sets, monitors and reviews environmental objectives, independently of the permit?	Yes	1.0	1.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	
2.2	Are there procedures that incorporate environmental issues into the following areas (as supported by demonstrable evidence e.g. written procedures):					
	□ the control of process change on the installation;	Yes	1.0	1.0	Managing Director	
	□ design and review of new facilities (including provision for their decommisioning), engineering and other capital	Yes	1.0	1.0	Managing Director	
	□ capital approval;	Yes	1.0	1.0	Managing Director	
	□ purchasing policy;	Yes	1.0	1.0	Managing Director	
2.3	Are there audits, at least annually, to check that all activities are being carried out in conformity with the above requirements?	Yes	1.0	1.0	Managing Director, HSE & Production Manager	SMS, EMS
2.4	Are they independent? (name the auditing body)	No	2.0	0.0		
2.5	Are there reports annually on environmental performance, objectives and targets, future planned improvements and or facilitate (participate in) local community liaison meetings?	Yes	1.0	1.0	Managing Director, HSE & Production Manager	
3	Does your company produce a public environmental statement? **You may score in this box for ISO 14001 and industry systems but not for EMAS as this is a requiremen for EMAS.**	No	1.0	0.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	

Operator Performance

		Yes/No	Points available	Points scored	Post or group responsible for each requirement	Document reference (*) or date by which systems will be in place (*see para 4.4.2)
4	Within the past 5 years have you failed to meet an improvement condition either set by the Agency in a Permit or Variation by the due date, without prior agreement? (minus 2 for each failure). ADD NUMBER OF FAILURES NOT Y OR N	0	-2.0	0.0	Operations Manager, Wellsite Suspervisor, HSE & Production Manager, Service Provider Managers.	
	Organisational Totals		**20.0**	**9.00**		

Enforcement History (0 to -40% weighting)

					Notice etc	Date Issued	Date Spent
1	**Enforcement , Improvement, Works, Compliance or Restoration Notices issued** in the past year by the Environment Agency under any legislation, by the Health and Safety Executive relevant to the COMAH Regulations or by local authorities under Part I of the Environmental Protection Act 1990 or relevant notice or Abatement Notices issued by local authorities or magistrates courts under Part III of the Environmental Protection Act 1990	0	None 0 1st - 5 2nd -10 3rd or more -40				
2	**Formal cautions, Enforcement Undertakings or Fixed Monetary Penalties issued** by the Environment Agency in respect of offences under any legislation in the last 3 years.	0	None 0 1st - 5 2nd -10 3rd or more -40				
3	**Prohibition, Stop, Suspension or Revocation Notices issued** by the Environment Agency under any legislation, by the Health and Safety Executive relevant to the COMAH Regulations or by local authorities under Part I of the Environmental Protection Act 1990 in the last 3 years	0	None 0 1st - 10 2nd or more -40				
4	**Convictions on prosecutions** brought by the Environment Agency under any legislation, by the Health and Safety Executive relevant to the COMAH regulations or by local authorities (in respect of offences under Parts I or III of the Environmental Protection Act 1990) in last 5 years (10 years where imprisonment was imposed). **Or any Variable Monetary Penalty.** [NB each individual offence counts separately].	0	None 0 1st - 15 2nd or more -40				

Enforcement History Total

		Entered	Spent	Extant	Score
1	Enforcement etc Notices	0	0	0	
2	Formal Cautions etc	0	0	0	
3	Prohibition etc Notices	0	0	0	0
4	Convictions on Prosecutions etc	0	0	0	

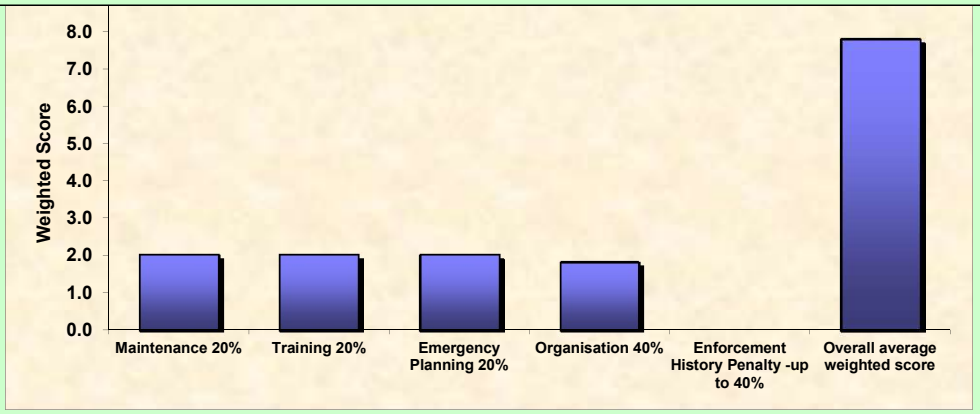
Enforcement History Total (min -40) **0**

Management Performance

9.0

Operator Performance

		Yes/No	Points available	Points scored	Post or group responsible for each requirement	Document reference (*) or date by which systems will be in place (*see para 4.4.2)



Band E= less than 2 D= 2 to 3.99, C= 4 to 5.99, B= 6 to 7.99 , A= 8 to 11	BAND=	B

Company : Egdon Resources UK Limited **Permit: 0**

Data calculations generating the above graph

Summary	Max	Score from above	Normalised to scale out of 10	Weighting	Weighted score
Maintenance 20%	**12.00**	12.00	10.00	20.00	2.0
Training 20%	**17.00**	17.00	10.00	20.00	2.0
Emergency Planning 20%	**12.00**	12.00	10.00	20.00	2.0
Organisation 40%	**20.00**	9.00	4.50	40.00	1.8
Enforcement History Penalty -up to 40%	**-40.00**	0.00	0.00	40.00	0.0
Overall average weighted score					**7.8**

Opra Banded Profile

Organisation Name:	Egdon Resources UK Limited
Case Number:	0

		Profile before any rules or capping applied		Opra Banded Profile used for charging	
Attribute		Number	Band	Number	Band
Complexity		0	A	0	A
		1	B	1	B
		0	C	0	C
		0	D	0	D
		0	E	0	E
Emissions	Air		-		-
	Water		-		-
	Land		-		-
	Sewer		-		-
	Waste Off Site		-		-
	Waste Input		-		-
Location			B		B
Operator Performance			B		B

Organisation Name:	Egdon Resources UK Limited	Case Number:	0

EPR Installations Application Charge Calculation

(excludes Compliance Rating)

Scoring Summary - Financial

Attribute	Band		Score	Total Score
Complexity	A	0	2	0
	B	1	15	15
	C	0	45	0
	D	0	82	0
	E	0	110	0
Emissions to Air	-			0
Emissions to Water	-			0
Emissions to Land	-			0
Emissions to Sewer	-			0
Emissions to Off-site Waste	-			0
Emissions - Waste Input	-			0
Location	B			10
Operator Performance	B			25
		Total Opra charging score		**50.00**

Indicative Fees & Charges (•) England ( ) Wales

Application Fee	£	10,300.00
Subsistence Charge*	£	5,050.00
Substantial Variation	£	5,650.00
Standard Variation	£	2,900.00
Partial Surrender	£	4,950.00
Full Surrender	£	6,350.00
Closure	£	-

** Does not take into account Compliance Rating*

Part A(2) and Part B Activities

Please ensure that you have completed these entries in the Listed Activities sheet. The charge shown will not include any charges associated with Local Authority Part A (2) or Part B activities that form part of the installation.
Refer to Installations Charging Scheme for further details.

Opra Charge Multipliers	
Application	206
Subsistence	101
Substantial Variation	113
Standard Variation	58
Partial Surrender	99
Full Surrender	127
Closure (Landfill only)	

Compliance Rating

Breach Category*	Events	Score per event	Total
1	0	60	0
2	0	31	0
3	0	4	0
4	0	0.1	0
		Compliance Index	**0**

Compliance Rating Band A

Compliance Rating Multiplier 95%

* Under Compliance Classification Scheme (CCS)

Opra Score	
Without Compliance Rating	**50**
Including Compliance Rating	**47.5**
Subsistence Fee:	**£ 4,797.50**