



Weaverthorpe Wellsite

Waste Management Plan

Environmental Permitting (England and Wales) Regulations 2016

- **Application for a Bespoke Mining Waste Operation with Flare**
- **Application for a Bespoke Installation**

ISSUE No.	Description
250527	Draft for Client Review
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1. PURPOSE AND CONTEXT

This Waste Management Plan forms part of an application to the Environment Agency to authorise the undertaking of specific 'permitted activities' at the proposed Weaverthorpe Wellsite (herein referred to as the 'Wellsite'). In the context of onshore oil and gas operations, a number of activities are considered applicable to the environmental permitting regime.

The Wellsite within which the 'permitted activities' are undertaken is considered a 'regulated facility' under The Environmental Permitting (England and Wales) Regulations 2016, as amended (EPR2016) [\[Ref.1\]](#). A 'mining waste operation' is considered a 'regulated facility' under EPR2016. Throughout the life of the Wellsite, this Waste Management Plan shall be considered a live 'operating technique' and must be complied with as it forms part of the environmental permit.

The primary purpose of the Waste Management Plan is to demonstrate that the 'mining waste operation' will meet the requirements of EPR2016 and, in turn, the Mining Waste Directive (MWD) [\[Ref.2\]](#) and the Waste Framework Directive (WFD) [\[Ref.3\]](#).

The Waste Management Plan sets out the necessary measures to ensure that extractive waste is managed in a controlled manner without endangering human health or harming the environment. The purpose of the Waste Management Plan is to demonstrate how Egdon Resources U.K. Limited (herein referred to as the 'Operator') will minimise, treat, recover and dispose of extractive waste whilst taking into account the principle of sustainable development.

The Waste Management Plan has been produced in accordance with EPR2016 which has been transposed, in part, from the MWD.

The Waste Management Plan has also been compiled based on the requirements and guidance from the Environment Agency's How to comply with your environmental permit guidance 6.14 [\[Ref.4\]](#).

The Operator is proposing to construct a wellsite ~850m to the east of the village of Foxholes located within the administrative boundary of North Yorkshire Council and within Foxholes with Butterwick parish. The boundary with the East Riding of Yorkshire lies approximately 350m to the east.

The Wellsite is located ~2 Km to the west of Wold Newton, ~15 Km south of Scarborough and ~16 Km northwest of Bridlington.

The Wellsite will be constructed to accommodate the drilling of an exploratory borehole to evaluate the potential for natural gas accumulations within the Sherwood Sandstone target formation.

An application to the Environment Agency is being proposed under EPR2016 to apply for a 'Mining Waste Operation with Flare', as defined by reference 1.8.6 of the Environment Agency (Environmental Permitting and Abstraction Licensing) (England) Charging Scheme [\[Ref.5\]](#).

For clarity, domestic legislation derived from European Union legislation such as the MWD and WFD continues to have an effect in domestic law following the UK's withdrawal from the European Union in accordance with the European Union (Withdrawal) Act 2018 [\[Ref.6\]](#). The MWD and WFD are therefore still applicable to this Waste Management Plan and activities performed by the Operator.

All figures included in this document, for example volumes, tonnages, formation depth represent best estimates at the time of document production, and may change, as operations develop.

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2. SCOPE

This Waste Management Plan is applicable to the Weaverthorpe Wellsite and all operations conducted therein. It is applicable to the Operator, its contractors and subcontractors and may be used in support of an application to the Environment Agency for an environmental permit under EPR2016.

This Waste Management Plan is the principle document for the management of all extractive wastes associated with the Wellsite.

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3. ABBREVIATIONS AND DEFINITIONS

":	Inch – A unit of linear measure equal to one twelfth of a foot (2.54 centimetres)
≤:	Less than or equal to sign. Used to show that a value is less than or equal to another value
%:	Percentage – A rate, number, or amount in each hundred.
~:	Approximately
BAT:	Best Available Technique
BOP:	Blowout Preventer
BSOR1995:	The Borehole Sites and Operations Regulations 1995
BTEX:	Benzene, Toluene, Ethylbenzene, Xylenes
CaCl ₂ :	Chemical formula for Calcium Chloride
CCTV:	Closed Circuit Television
CH ₄ :	Chemical formula for Methane
Cl:	Chloride Ions
CO ₂ :	Chemical formula for Carbon Dioxide
CQA:	Construction Quality Assurance
DCR1996:	The Offshore Installations and Wells (Design & Construction, etc) Regulations 1996
EGMBE:	Ethylene Glycol Monobutyl Ether
EPR2016:	The Environmental Permitting (England and Wales) Regulations 2016, as amended
EWC:	European Waste Catalogue also referred to as LoW (List of Waste)
FIT:	Formation Integrity Test
Groundwater Activity:	Has the meaning given within Regulation 2 of EPR2016
H ₂ O:	Chemical formula for Water
H ₂ S:	Chemical formula for Hydrogen Sulphide
ha:	Hectare – A unit of square measurement equal to 10,000 square metres
HDPE:	High-density polyethylene
HSE:	Health, Safety and Environmental

IED:	The Industrial Emissions Directive aims to prevent and reduce harmful industrial emissions, while promoting the use of techniques that reduce pollutant emissions and that are energy and resource efficient.
Installation Activity:	Has the meaning given within Regulation 2 of EPR2016
Kg:	Kilogram – A unit of mass equal to 1,000 grams
Km:	Kilometre – A unit of measurement of length equal to one thousand metres
LOT:	Leak-off Test
m:	Metre – A unit of measurement of length equal to one hundred centimetres
m³:	Cubic metre – An SI unit of volume with a length, height, and width of one metre, with 1,000 litres of space.
MDBGL:	Measured Depth below ground level
Mining Waste Facility:	Has the meaning given within Regulation 2 of EPR2016
Mining Waste Operation:	Has the meaning given within Regulation 2 of EPR2016
MWD:	The Mining Waste Directive – Directive 2006/21/EC of the European Parliament and the Council on the management of waste from extractive industries.
N₂:	Chemical formula for Nitrogen
NGR:	National Grid Reference
NO:	Chemical formula for Nitrogen Oxide
NORM:	Naturally Occurring Radioactive Material
NSTA:	North Sea Transition Authority
O₃:	Chemical formula for Ozone
OEUK:	Offshore Energies UK
Operating Technique:	Documents approved by the regulator to ensure compliance with the issued permit
Operator:	Has the meaning given within Regulation 7 of EPR2016
Permitted Activities:	Any activity or operation defined within Schedule 1 to 29 of EPR2016
Regulated Facility:	Has the meaning given within Regulation 8 of EPR2016
RKB:	Rotary Kelly Bush used as a reference point for vertical measurements.
SR2015 No.1:	The Environment Agency's Standard Rules for 'The management of extractive waste not including a waste facility, generated from onshore oil and gas prospecting activities.

TVD:	True Vertical Depth measured from a reference point (RKB for Weaverthorpe-1 Well) to a specific point within the well.
UK:	United Kingdom
VOCs:	Volatile organic compounds
Water Discharge Activity:	Has the meaning given within Regulation 2 of EPR2016
WCU:	Well Clean Up
WFD:	European Community (EC) Directive 2006/12/EC
WM3:	The Environment Agency's Technical Guidance WM3: Waste Classification - Guidance on the classification and assessment of waste
WR11:	Environment Agency's form for 'Notice of the intention to drill for minerals'
WR2011:	The Waste (England and Wales) Regulations 2011

Table 1: Abbreviations and Definitions

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4. OBJECTIVES OF THE WASTE MANAGEMENT PLAN

The objectives of the Waste Management Plan are derived from Article 5 of the MWD and are detailed as follows:

- *To prevent or reduce waste production and its harmfulness, in particular, by considering:*
 - *Waste management in the design phase and in the choice of method used for mineral extraction and treatment;*
 - *The changes that the extractive waste may undergo in relation to an increase in surface area and exposure to conditions above ground;*
 - *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 the community level and with the requirements of the directive, where relevant;*
 - *Putting topsoil back in place after the closure of the mining waste facility or if this is not practically feasible, reusing topsoil elsewhere; and*
 - *Using less dangerous substances for the treatment of mineral resources.*

With regards to the prevention and reduction of waste production, the location of the Weaverthorpe-1 Well was determined by the target formation and geology. The location was also determined by other considerations such as planning constraints, access agreements etc. The design of the Weaverthorpe-1 Well was informed by all of these factors and as such the minimisation of waste from a design basis is constrained by the selection of hole sizes that would achieve the planned targets.

Extractive waste will be stored at surface in dedicated areas within the 'regulated facility'. Extractive waste will have minimal contact with above ground conditions, as they will be confined to enclosed / partially enclosed tanks with exception of natural gas.

Placing extractive waste back into the extraction void is not feasible as the well is cased, cemented and then tested for oil and/or gas. In short, the extraction voids need to remain in order to produce from the well.

The Wellsite will be constructed by excavating top soil and sub soil and stored at the site in a bund acting as both a storage bund and screening against any visible impact from neighbouring properties. The soils will be laid back from whence it came, restoring the site to its pre-development condition and negating any waste.

Where practicable, dangerous substances will be substituted with less dangerous substances for the treatment of mineral resources. However, the substances must be able to fulfil the same function and to the same standard.

- *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 the Directive where relevant.*

Where possible waste will be recovered to surface and re-used for further well operations. Such examples include the re-use of drilling fluid and brine where applicable.

- *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 mining waste facility and by choosing a design which:*
 - *Requires minimal and, if possible, ultimately no monitoring, control and management of the closed mining waste facility;*
 - *Prevents or at least minimises any long term negative effects for example attributable to migration of airborne or aquatic pollutants from the mining waste facility; and*
 - *Ensures the long-term geotechnical stability of any dams or heaps rising above the pre-existing ground surface.*

With regards to the mining waste operation, no extractive waste shall remain at the Wellsite indefinitely. Upon closure of the site, it will be restored to its natural state with the removal of all site surface equipment. The wellhead will be

mechanically cut off below the surface (after the required monitoring period). All extractive waste shall be treated / disposed in accordance with the receiving facilities environmental permit.

5. REGULATED FACILITY

The 'regulated facility' is located in the countryside in the county of North Yorkshire. It is centred on National Grid Reference (NGR) TA 02308 73142 and is located at the following address.

Weaverthorpe Wellsite
 Land North of Butt Lane
 Foxholes
 North Yorkshire
 YO25 3HY



Figure 1: Weaverthorpe Wellsite – Current (Source: Google Earth 17/12/2024)

5.1 Site Location Plan and Site Layout Plan

A number of site plans have been provided within the Site Plans document (04 – Site Plans) and detail the extent of the Wellsite, including its location, site layouts and point source emissions.

A copy of the following plans are provided within the Site Plans document (04 – Site Plans).

- 04A - ZG-ER-WRP1-FH-EPR-04-01 Location Plan 2500 Scale A2
- 04B - ZG-ER-WRP1-FH-EPR-04-02 Location Plan 10000 Scale A3
- 04C - ZG-ER-WRP1-FH-EPR-04-03 Indicative Site Layout Plan - Construction Phase 500 Scale A2
- 04D - ZG-ER-WRP1-FH-EPR-04-04 Indicative Site Layout Plan - Drilling Phase 500 Scale A3
- 04E - ZG-ER-WRP1-FH-EPR-04-05 Indicative Site Layout Plan - Well Testing Phase 500 Scale A3
- 04F - ZG-ER-WRP1-FH-EPR-04-06 Indicative Site Layout Plan - Retention Phase 500 Scale A2
- 04G - ZG-ER-WRP1-FH-EPR-04-07 Indicative Site Layout Plan - Well Abandonment Phase 500 Scale A3
- 04H - ZG-ER-WRP1-FH-EPR-04-08 Indicative Section Plan - Covered Ditch Construction 25 Scale A3

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6. ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2016

6.1 Permitted Activities

The Wellsite has yet to be constructed and does not currently hold an environmental permit. Current Operational Status (Pre-Application)

The Wellsite is located on agricultural land to the north of Butt Lane, near Foxholes, and is currently used for growing a potato crop.

The Wellsite is located ~850m to the east of the village of Foxholes, ~2 Km to the west of Wold Newton, ~15 Km south of Scarborough and ~16 Km northwest of Bridlington and covers an area of approximately 1.3 ha including the access track.

The Wellsite is located within the administrative boundary of North Yorkshire Council and within Foxholes with Butterwick parish.

The closest residential receptors are:

- West Field House – 570m; and
- Foxholes – 870m.

The proposal is to construct a temporary Wellsite within an enclosed and secure compound to drill an exploratory borehole. Should natural gas be encountered as predicated, the drilling rig will be demobilised from the Wellsite and the intention is then to undertake a short term well test. If natural gas is not encountered during the drilling phase, the exploratory borehole will be decommissioned (abandoned) in accordance with industry guidance, the drilling rig and associated equipment then removed and the Wellsite restored to its former condition.

6.2 Proposed Development

The Operator is proposing to undertake four (4) phases of development as illustrated within Table 2.

Phase	Description	Approximate Timescale
Phase 1	Construction of Site Access and the Wellsite a) Access track civils from Butt Lane; construct access track along field boundary b) Install groundwater monitoring boreholes c) Earthworks on well pad; install fencing and gates d) Create perimeter containment system e) Install liner/tertiary containment f) Construct well cellar g) Install temporary matting as usable surface platform	5 weeks
Phase 2	Drilling of the Weaverthorpe-1 Well. a) Set conductor b) Mobilise rig and services c) Drill Weaverthorpe-1 well d) Log well to evaluate reservoir e) Rig down equipment and release drilling rig	8 weeks

Phase	Description	Approximate Timescale
Phase 3	Testing – Dependent on the outcome of Phase 2 a) Mobilise test spread b) 5–7 days operational well test (short term well test), with shut-in periods to gather downhole data c) Gas management via approved ground flare system d) Suspend well to evaluate results e) Remove equipment and facilities	4 weeks
Phase 4a	Site Suspension a) Success case (proven gas from test evaluation): with well suspended, reduce site area size, remove temporary matting, install aggregate to create smaller working platform b) Install a surface water interceptor to manage clean surface water run-off	4 weeks
Phase 4b	Site Restoration a) Failure case (no gas encountered during drilling, or insufficient gas following test evaluation): plug wellbore with cement plugs to surface, cut conductor below ground level and remove well cellar, remove matting and liner, backfill perimeter ditches and restore site to agricultural land	6 weeks

Table 2: Phases of Development

Phase 1 – Wellsite Construction

Construction of the Wellsite will be undertaken during Phase 1 and will include the construction of an access and working site area with a well cellar, perimeter containment ditch and tertiary containment system.

The perimeter containment ditch system will be installed to facilitate easy reduction in site area in the testing success case. The design and installation of the well cellar, together with the design of the tertiary containment system will be subject to review and verification by the Environment Agency, and installed under a Construction Quality Assurance Plan (CQA).

Groundwater monitoring boreholes will be installed during the site construction phase.

The tertiary containment system and perimeter containment ditch ensures that any accidental spillages that may occur during the subsequent phases of operation are contained within the Wellsite.

Security fencing will be installed.

Phase 2 – Drilling Operation

The second phase of the development will include the drilling of an exploratory borehole (Weaverthorpe-1 Well). Following mobilisation of the drilling rig to site, the Weaverthorpe-1 Well will be drilled including a c400m deviated section in a north-westerly direction.

If drilling results are positive then the Weaverthorpe-1 Well will be cased and completed for testing as set out in Phase 4a. If not, then operations will move to abandonment and restoration as detailed in Phase 4b.

Phase 3 – Short Term Well Test

The third phase of the development will include a short term well test of the Weaverthorpe-1 Well. Following demobilisation of the drilling rig, a well test spread will be mobilised to site and will include a Shrouded Ground Flare, a 3-phase separator, waste storage tanks, a slick line unit and a coiled tubing unit.

The test will follow a standard short-term well test permitted under the well test regulations provided by the North Sea Transition Authority (NSTA). This will limit flare activity to a maximum of 96 hours over the full test period. Following the testing period, the Weaverthorpe-1 Well will be suspended to evaluate the results.

Phase 4a – Site Suspension

In a success case, the Weaverthorpe-1 Well will remain suspended and the well head and well cellar left in place, whilst regulatory approvals for production are progressed, developed and submitted.

The temporary matting will be removed, and the site working platform reduced; aggregate will be brought in to facilitate this. A surface water interceptor will be installed during this phase to manage clean surface waters.

The Wellsite will be maintained on a care and maintenance basis until such point as all regulatory approvals for production are progressed or if such approvals are not forthcoming then operations will move to abandonment and restoration as detailed in phase 4b.

Phase 4b – Site Restoration

In a failure case following testing (or failure to gain regulatory approvals as per phase 4a above) the well will be fully abandoned by setting cement plugs in the casing to surface, cutting the conductor below ground level and capping the casing with a welded plate. The well cellar will be removed, as will the perimeter/tertiary containment systems, groundwater borehole systems and the temporary matting (or aggregate). The groundwater monitoring boreholes will be decommissioned and the site will be restored to its original land condition and contours.

6.3 Non-Permitted Activities

Additional activities associated with the development, but not regulated under EPR2016 as a 'permitted activity' includes, but is not limited to:

- Car parking for staff vehicles;
- Provision of welfare facilities for site staff;
- Well and wellsite maintenance; and
- Storage and disposal of non-hazardous and hazardous wastes not directly associated with the permitted activities.

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7. ENVIRONMENTAL LEGISLATION AND APPLICABILITY

The proposed Wellsite has yet to be constructed and does not currently hold an environmental permit.

7.1 Proposed Permitted Activities

The Wellsite will be the subject of several activities which, under current environmental legislation, requires an environmental permit. The Environment Agency regulates all permitted activities under the Environmental Permitting (England and Wales) Regulations 2016, as amended (EPR2016). Under EPR2016, Operators are required to submit environmental permit applications to the Environment Agency to seek approval to undertake such activities.

Onshore oil and gas developments are the subject of the environmental permitting regulations, and as such a number of environmental permits will be required to be obtained from the Environment Agency.

This Waste Management Plan provides details on the proposed waste operations to be conducted at the Wellsite and provides an explanation as to which permitted activities will be required/applied for.

7.2 Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency regulates all permitted activities under EPR2016 and require Operators to submit environmental permit applications to seek approval to undertake such activities. The Operator has assessed the activities associated with the proposed operations and considers certain activities to fall in scope of EPR2016 and therefore require the necessary environmental permits.

7.2.1 Industrial Emissions Activity

Schedule 1, Part 2 of EPR2016 details a number of activities that are classified as an Industrial Emissions Activity including 'Energy Activities' (Chapter 1) and 'Waste Management' (Chapter 5). Energy Activities include the storage of crude oil, whilst Waste Management includes the incineration of waste.

7.2.1.1 Incineration of Natural Gas

Schedule 1, Part 2 of EPR2016 transposes the requirements of the Industrial Emissions Directive, which requires an environmental permit to authorise an installation operation for the incineration and co-incineration of waste, as detailed within Section 5.1.

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.*

The proposed short term well testing phase of operations, which include a Well Clean Up (WCU) and Short Term Well Test, may involve the incineration of natural gas exceeding 10 tonnes per day and therefore an installation permit is being applied for.

7.2.1.2 Oil Storage

Schedule 1, Part 2, of EPR2016 transposes the requirements of the Industrial Emissions Directive, which requires an environmental permit to authorise an installation for gasification, liquefaction and refining activities, as detailed within Section 1.2, Part A(1) including the loading, unloading, handling or storage of, or the physical, chemical or thermal treatment of crude oil.

The proposed exploratory operations may involve the handling and storage and unloading of oil or condensate and therefore under EPR2016 a Standard Rules SR2015 No.2 Crude Oil Storage permit will be applied for.

7.2.2 Mining Waste Operation

Schedule 20 of EPR2016 defines a mining waste operation as being the management of extractive waste, whether or not it involves a waste facility. Under EPR2016, an environmental permit is required to authorise a mining waste operation.

In order to drill, test and undertake well treatments from the proposed Weaverthorpe-1 Well, it is necessary to apply for an environmental permit for a mining waste operation (which includes a flare).

The 'mining waste operation' will consider the extractive waste volumes and waste streams created as a result of both the drilling process and any subsequent testing and well treatment operations.

7.2.3 Groundwater Activity

Under Schedule 22 of EPR2016, 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, under EPR2016. The Environment Agency will then determine whether the groundwater activity needs to be permitted.

During the life of the well, it may be necessary to undertake near wellbore treatments, including the use of liquid CO₂ which falls within the definition of a 'groundwater activity' under Schedule 22 of EPR2016.

Schedule 22 3 (3) of EPR2016 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.

To assist the regulator in determining whether the proposed activities are/are not considered groundwater activities a description of the operations, together with a technical justification as to why the Operator believes these can be excluded under Schedule 22 paragraph 3 (3) of EPR2016, is included within the Waste Management Plan (05 - Waste Management Plan) provided in support of the environmental permit application.

7.2.4 Water Discharge Activity

Schedule 21 of EPR2016 relates to water discharge activities, including the discharge or entry to inland freshwaters, coastal waters or relevant territorial waters of any trade effluent.

For clarity, the Environment Agency has provided the following response with regards to surface water discharges in their pre-application response:

'Please note that with regards to the water discharge activity, providing that the water discharged from the site is only unpolluted rainwater and you are taking necessary measures to prevent pollution we would not regulate this as a Schedule 21 water discharge activity. We may put additional restrictions on discharge to the site during well workover or testing phases.'

The Operator is proposing to discharge only 'clean' surface run-off water from the Wellsite and therefore a surface water discharge permit will not be applied for.

The discharge of 'clean' surface run-off water from the Wellsite will be the subject of a Surface Water Management Plan (13 – Surface Water Management Plan) provided in support of the environmental permit application.

For clarity, the Operator is not proposing to discharge surface run-off water during Phase 2 and Phase 3 operations. Surface run-off water collected within the perimeter ditch during Phase 2 (drilling operations) and Phase 3 (short term well test) will be transferred off site by an Environment Agency licenced waste contractor to an Environment Agency licensed waste treatment facility.

In the event that the Weaverthorpe-1 Well is a success case, 'clean' surface run-off water will be discharged to surface through a Class 1 Interceptor which will be installed following a successful short term well test phase of operations.

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

Under Section 199 of the Water Resources Act 1991 [\[Ref.6\]](#) (as amended by the Water Act 2003 [\[Ref.7\]](#)), 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 designs, together with storage and use of chemicals and drilling muds, accompanies the WR11 application form.

The Weaverthorpe-1 Well will be the subject of an individual WR11 application.

8. WASTE GENERATING ACTIVITIES

A waste is defined in Article 3(1) of the MWD by reference to Article 3(1) of the WFD. The definition is; *'waste' shall mean any substance or object which the holder discards or intends or is required to discard.*

The wastes are defined in Article 3 of the Directive as inert, non-hazardous or hazardous and are as follows:

Hazardous Waste:	A hazardous waste is defined as a waste that has one or more of the fifteen specified hazardous properties listed in Annex III to the WFD. The application of this is determined by the List of Wastes Decision [Ref.9] .
Non Hazardous Waste:	A waste, which is neither classed as inert or hazardous.
Inert Waste:	Waste which does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant and in particular not endanger the quality of surface water and/or groundwater.

A summary of the waste generating activities associated with operations at the proposed Wellsite is outlined below, with a more detailed description of each activity provided within each subsection:

- Wellsite construction activities;
- Drilling of the Weaverthorpe-1 well;
- Near wellbore treatment operations;
- Short term well test;
- Discharge of Surface Water; and
- Well Abandonment and Partial Well Abandonment.

The proposed activities will be undertaken in accordance with the Environment Agency Onshore Oil and Gas Sector Guidance [\[Ref.10\]](#). Well operations will be undertaken in accordance with The Borehole Sites and Operations Regulations 1995 (BSOR1995) [\[Ref.11\]](#), The Offshore Installations and Wells (Design & Construction, etc) Regulations 1996 (DCR1996) [\[Ref.12\]](#) and other relevant legislation standards and guidance.

Non-extractive waste is not subject to an environmental permit under MWD, and as such has not been included in detail.

For clarity, the source of extractive waste concerned within this Waste Management Plan shall be from the proposed Weaverthorpe-1 drilling, short term well test, well workover and well treatment operations.

8.1 Wellsite Construction Activities

The Operator is proposing to construct a temporary Wellsite within an enclosed and secure compound to drill an exploratory borehole. Whilst the surface construction activities are not considered 'permitted activities' under EPR2016, it is important to outline how the Wellsite has been designed to ensure environmental containment should an onsite pollution event occur.

The Wellsite will be constructed by initially removing topsoil and subsoil and relocating it to the western boundary in a separate soil bund which provides mitigation against visual impact to any nearby receptors whilst also storing the soil which will be utilised during remediation of the Wellsite.

If required, the subsoil may be the subject of a 'cut to fill' method which involves the excavation of subsoil from the higher areas of the site and relocating it to the lower areas of the site to create a level plateau.

A well cellar will be constructed in the centre of the Wellsite, from which the exploratory borehole will be drilled. The well cellar will be 2.4m internal diameter with a minimum depth of 2.75m-, constructed with precast concrete rings encased with a minimum 200mm concrete surround (jacket).

A reinforced concrete drilling pad will be constructed at surface, immediately surrounding the well cellar. The concrete pad will be designed and constructed in accordance with the proposed drilling rig loading requirements.

A perimeter containment ditch will be excavated around the perimeter of the Wellsite which will form part of the Wellsite's containment measures ensuring that any surface run-off water and surface spillages are contained within the Wellsite.

A High Density Polyethylene (HDPE) impermeable membrane will be installed across the Wellsite to provide a tertiary containment system which will ensure any surface run-off water and spillages flow to the perimeter containment ditch for subsequent collection by road tanker.

The HDPE impermeable membrane will be protected by two layers of non-woven geo-textile matting which will be placed above and below the HDPE impermeable membrane to provide protection from the underlying ground and from the site surface, reinforcing the site integrity.

The HDPE impermeable membrane will be installed in accordance with a Construction Quality Assurance (CQA) Plan and will be integrity tested during installation overseen by an independent third party CQA inspector.

The HDPE impermeable membrane is incorporated into the well cellar construction to maintain environmental integrity of the Wellsite.

The internal containment ditch will be piped and backfilled (French Drain).

For clarity, the Operator is not proposing to discharge surface run-off water during Phase 2 and Phase 3 operations. Surface run-off water collected within the perimeter ditch during Phase 2 (drilling operations) and Phase 3 (short term well test) will be transferred off site by an Environment Agency licenced waste contractor to an Environment Agency licensed waste treatment facility.

In the event that the Weaverthorpe-1 Well is a success case, 'clean' surface run-off water will be discharged to surface through a Class 1 Interceptor which will be installed following a successful short term well test.

Following the installation of the well cellar and tertiary containment system, temporary track matting will be installed across the Wellsite to provide a working surface. The temporary track matting will be Dura-Base 102mm thick HDPE interlocking matting or similar.

For clarity, in the event of a success case, the area of the Wellsite will be reduced. The temporary track matting will be removed and stone aggregate will be installed across the reduced area of the wellsite.

For clarity, construction operations associated with the development are not the subject of this waste management plan as it is not considered extractive waste. However, the principles of waste management, and in turn The Waste (England and Wales) Regulations 2011 (WR2011) [\[Ref.13\]](#) are applicable to construction waste and shall be managed in accordance with the waste hierarchy.

8.2 Drilling of the Weaverthorpe-1 Wellbore

The Operator is proposing to drill an appraisal wellbore (Weaverthorpe-1) within the Wellsite. In the event that hydrocarbons are encountered, the intention would be to proceed with a short term well test. Should no hydrocarbons be encountered during the drilling phase, the drilling rig and associated equipment will be demobilised and plans will be prepared to restore the site to its former condition.

8.2.1 Drilling of the Weaverthorpe-1 Well

The Weaverthorpe-1 Well shall be drilled in sections with an appropriate drilling rig. The exact well design shall be agreed with the Environment Agency by way of WR11 application prior to drilling of the Weaverthorpe-1 Well.

An indicative well design has been provided within the Chemical Inventory (09 – Chemical Inventory), which shows the structure of the well, the formations being drilled, the drilling fluid being proposed and the casing sizes and setting depths.

The specific casing depth will not rely on the estimate provided within this application but will be determined by the actual formation tops, as determined by sample and log evaluation during drilling of the Weaverthorpe-1 Well.

Drilling fluid additives shall be the subject of approval by the Environment Agency prior to the undertaking of any drilling activities. The Operator is proposing to use a number of drilling additives which have been detailed within the

Chemical Inventory (09 – Chemical Inventory) together with the location on where these additives shall be used within the well.

The drilling of the Weaverthorpe-1 Well is anticipated to last no more than eight (8) weeks and the anticipated extractive wastes during this phase include:

- Waste Clays and Sand;
- Water Based Drilling Fluid;
- Water Based Rock Cuttings;
- Chloride Based Drilling Fluid; and
- Chloride Based Rock Cuttings.

A copy of the Chemical Inventory and Well Schematic (09 – Chemical Inventory and Well Schematic) is provided in support of the environmental permit application.

8.2.1.1 Geological Prognosis

The formations to be encountered during the drilling and construction of the Weaverthorpe-1 Well and their estimated depths are detailed in the Well Schematic included within the Chemical Inventory (09 – Chemical Inventory) provided in support of the environmental permit application.

8.2.1.2 Indicative Well Design

The exact well design will be contingent on the actual conditions encountered during drilling, however an indication of how the Weaverthorpe-1 Well will be constructed is summarised in Table 3.

Hole Section	TVD (RKB) Depth (m)	Mud System	Casing (")	Formation	Cement
16"	15	Water Based	13 ³ / ₈	Cretaceous Chalk Group	Section depth to surface
12 ¹ / ₄ "	280	Salt Saturated	9 ⁵ / ₈	Speeton Clay	Section depth to surface
8 ¹ / ₂ "	780	Salt Saturated	7	Mercia Mudstone	Section depth to within 9 ⁵ / ₈ " casing
6 ¹ / ₈ "	1,125	Salt Saturated	4 ¹ / ₂	Sherwood Sandstone	Section depth to within 7" casing

Table 3: Weaverthorpe-1 Well Construction Summary

8.2.2 Logging

Geological logging is undertaken during well construction to determine whether formations encountered during drilling may contain hydrocarbons. The borehole logs assist the Operator in determining specific zones, which justify subsequent testing. Coring may also be undertaken.

8.2.3 Perforation

In order to establish communication between the formation(s) being tested and the wellbore, the casing must be perforated.

The perforating operation, in particular the use of explosive charges, is regulated by the Police Authority and the Health and Safety Executive. Perforating may be undertaken several times as deemed necessary by the Operator.

Once the casing has been perforated, the fired perforating guns will be recovered at a time determined within the operation.

The anticipated extractive wastes during this phase includes:

- Circulation Fluid / Suspension Brine; and
- Metal Debris / Metal Scrapings.

8.2.4 Well Integrity

Regulation 13 of The Offshore installations and Wells (Design and Construction, etc) Regulations 1996 requires that well-operators ensure that a well is designed, constructed and controlled (throughout its lifecycle) so there can be no escape of fluids from the well and that the risks to strata to which it is connected are as low as reasonably practicable. This is done by (Regulation 14) taking into account the geological strata and formations, and fluids within them and any hazard which such strata and formations may contain at pre-design stage and (Regulation 16) ensuring that every part of a well is composed of material suitable to achieving these purposes.

The design and well activities must be independently reviewed (Regulation 18) and submitted to the Health and Safety Executive prior to constructing the well.

As per the OEUK Well Life Cycle Integrity Guidelines [Ref.14], integrity tests shall be undertaken during the construction of the well. These shall include pressure testing of the casing once cemented and the BOP installed, prior to drilling out the cement shot, to a higher pressure than the maximum potential pressure the casing will be subjected, and then the cement seal around the shoe will be tested by a Leak Off Test (LOT) or a Formation Integrity Test (FIT).

By following these regulations and guidelines to ensure integrity of the well, this should limit the risk of contamination to the environment.

8.3 Well Completion

Once the well has been drilled (in accordance with details included in the WR11) a completion assembly shall be run into the well to allow the production of reservoir fluids. The completion may consist of production tubing, packers, sliding sleeves, down hole pumps or other equipment to allow the reservoir fluids to move to surface. The completion is semi-permanent and will be retrieved at the end of the life of the well or during well maintenance.

On completion of the drilling phase, or prior to testing, circulation runs will be conducted to remove residual muds or debris from the drilling using a clean fluid, as shown in the Chemical Inventory and Well Schematic (09 – Chemical Inventory and Well Schematic). The waste from the circulation run will be managed at surface using the same techniques as the drilling phase.

The anticipated extractive wastes during this phase include:

- Circulation Fluid / Suspension Brine;
- Water Based Drilling Fluids; and
- Salt Saturated Water Based Drilling Fluids.

A copy of the Chemical Inventory and Well Schematic (09 – Chemical Inventory and Well Schematic) is provided in support of the environmental permit application.

8.4 Borehole Clean Up

A clean up assembly will be run into the well and will scrape and remove any debris from the perforations. A clean fluid will be circulated down the work string during the wellbore cleaning operation and will circulate out to surface any debris. The debris, consisting of small steel scrapings, will be separated from the fluid at surface using conventional shakers and circulating tanks. The steel scrapings are anticipated to be very small in volume, due to the design of the perforation guns, insofar as they have been designed to minimise debris by reducing external burrs (steel edges) which form as the jet exists the casing.

The anticipated extractive wastes during this phase include:

- Circulation Fluid / Suspension Brine; and
- Metal Debris / Metal Scrapings.

8.5 Well Test

Upon completion of the drilling phase, the Weaverthorpe-1 Well will be the subject of a well testing phase.

The well testing phase of operations will include a WCU and a short term well test.

The purpose of the short term well test is to evaluate the commercial viability of the hydrocarbon reservoir, if encountered. During the short term well test, hydrocarbons will be produced.

A Waste Gas Management Plan (10 – Waste Gas Management Plan) has been developed for the purpose of demonstrating Best Available Technique (BAT) for the management of waste gas as a result of the short term well testing phase of operations.

A 96 hr flow test will be undertaken.

The anticipated extractive wastes during this phase include:

- Natural Gas;
- Circulation Fluid / Suspension Brine; and
- Formation Water.

A copy of the Waste Gas Management Plan (10 – Waste Gas Management Plan) is provided in support of the environmental permit application.

8.5.1 Well Clean-up Phase

A Well Clean Up (WCU) is conducted when trying to bring the reservoir fluids to surface for the first time, either after drilling, after a period of in-operation or after any maintenance has been conducted in the well. The aim of the WCU is to get the reservoir fluids to surface and flowing at a consistent rate for testing.

A WCU will involve the use of a well test spread, typically consisting of at least a choke manifold, surface safety valve, three-phase separator, fluid storage tanks, vent line(s) and a combustion unit (flare).

Waste gas produced as a result of the WCU shall be managed in accordance with the approved BAT as demonstrated by the Waste Gas Management Plan (10 – Waste Gas Management Plan).

Ordinarily, natural gas flows to surface however, during a WCU the rate of natural gas produced is likely to fluctuate unpredictably. Any natural gas composition data acquired during a WCU may not be accurate due to natural gas being comingled with wellbore fluids.

Once at surface, natural gas and produced fluids will be diverted by temporary pipework to a three-phase separator, which will separate out any hydrocarbon phases, condensate and any formation water.

Condensate, which for clarity is not a waste, will be diverted via temporary pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to a permitted refinery for sale.

Any formation water, which is considered a waste, will be diverted via temporary pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to 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.

Any natural gas separated during the three-phase separation will be managed in accordance with the identified BAT detailed within the Waste Gas Management Plan (10 – Waste Gas Management Plan).

For clarity, it is anticipated that wellbore fluids from the Weaverthorpe-1 Well will consist mainly of dry natural gas and therefore the potential for crude oil, condensate and formation water is limited.

A copy of the Waste Gas Management Plan (10 – Waste Gas Management Plan) is provided in support of the environmental permit application.

8.5.2 Short Term Well Test

Should the WCU phase indicate that hydrocarbons are present then testing operations will continue with the short term well test which is carried out to assess the commercial viability of the well and establish detailed gas composition.

Once at surface, natural gas and produced fluids will be diverted by temporary pipework to a three-phase separator, which will separate out condensate, formation water and associated natural gas.

Condensate, which for clarity is not a waste, will be diverted via temporary pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to a permitted refinery for sale.

Any formation water, which is considered a waste, will be diverted via temporary pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to 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.

Formation water produced during the short term well test 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 the radionuclide's 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 BAT.

Again, any natural gas separated during the three-phase separation will be managed in accordance with the identified BAT detailed within the Waste Gas Management Plan (10 – Waste Gas Management Plan).

The anticipated extractive wastes during this phase include:

- Natural Gas;
- Circulation Fluid / Suspension Brine; and
- Formation Water.

A copy of the Waste Gas Management Plan (10 – Waste Gas Management Plan) is provided in support of the environmental permit application.

8.6 Near Wellbore Treatments

Well treatments may be undertaken following the drilling operations. This may include the use of Nitrogen as a means of lifting or the use of Carbon Dioxide as a means of lifting and wellbore clean up. The same section may be the subject of repeated well treatments in the event the first treatment is only partially successful in cleaning the near wellbore formation. During the treatments a Shrouded Ground Flare will be used.

8.7 Well Lifting Techniques

If the well does not flow (lift) naturally, the following techniques are available to artificially lift hydrocarbons to surface:

- Nitrogen (N₂) lift (Gas Lift);
- Carbon Dioxide (CO₂) lift (Gas Lift); and/or
- Mechanical lift.

The anticipated extractive wastes during this phase includes:

- Circulation Fluid / Suspension Brine;
- Nitrogen (N₂);
- Carbon Dioxide (CO₂);
- Formation Water; and
- Natural Gas.

8.7.1 Nitrogen Lift

To aid the initial flow of hydrocarbons (oil and gas), N₂ may be injected into the wellbore to displace wellbore fluids, reducing its hydrostatic weight. N₂ is classified as an inert waste and venting of such considered a closed loop system, insofar as N₂ is extracted from the atmosphere and is vented back to atmosphere. No N₂ would remain in the formation.

8.7.2 Carbon Dioxide Clean Out

The purpose of a CO₂ cleanout is to assist in the removal of all wellbore fluids and near wellbore debris sustained during the drilling operation, thus restoring near wellbore permeability. In comparison to N₂ lifting, a CO₂ cleanout allows for greater debris lifting as it is circulated down as a liquid and produced back as a gas. The liquified CO₂ is pumped down the well at a pressure, high enough to facilitate the liquified form of the CO₂.

The pressure is maintained within the well as it is pumped down to the target area and is left under pressure to permeate in its liquid form behind the debris of the near wellbore formation, this is applied below the fracture gradient of the formation.

The well is then opened at surface in a controlled manner to reduce the pressure within the wellbore and in turn cause the downhole liquid CO₂ to rapidly change from a liquid to a gas. This process results in a rapid expansion of CO₂, which forces the near wellbore debris from the perforations into the wellbore and back to surface. All liquid CO₂ injected into the formation will return to surface in a gaseous state and will be passed through the three-phase separator.

Whilst the pumping of liquid CO₂ into the perforations within deep saline water bearing formations is a 'groundwater activity', the liquid CO₂ will return to surface in a gaseous state. No injected CO₂ will remain in the formation and therefore the injection of liquid CO₂ is considered de-minimis and can be excluded under Schedule 22 3 (3) of EPR2016 from requiring a groundwater activity permit.

Waste classification and quantities are estimated in Section 9 of this Waste Management Plan.

8.7.3 Mechanical lift

In the event the well is not able to flow to surface naturally a number of lifting techniques are available to the onshore oil and gas industry, including the aforementioned N₂ / CO₂ lift. Another lifting technique is a mechanical lift. The use of mechanical lifting techniques is common place within oil production wells and can take a number of forms.

As a contingency, the Operator may use a mechanical lifting technique known as swabbing to aid in the lifting of wellbore fluids to surface. Swabbing is performed by unloading liquids from the well using a specific tool string incorporating a swab cup assembly that can be run into the wellbore by various means (wireline, coiled tubing or drillpipe). When the assembly is run, the specially shaped swab cups have a tight tolerance on the wellbore casing or tubing and allow both lifting of the liquids from the wellbore and temporary removal of the hydrostatic column within the well.

The methods of longer term mechanical lifting include 'Beam Pump', 'Rod Pumping Hydraulic Pump Jack' and an 'Electric Submersible Pump' all of which are lifting techniques the Operator has identified as being suitable for the well. The techniques involve either running a rod string into the well attached to a downhole pump located in the bottom of the tubing string and the rods are then lifted and lowered into the well by the surface equipment, or by pumping liquids up the tubing from downhole.

A downhole pump does not work effectively when completing a gas reservoir. Downhole pumps are required to be submerged in liquid to avoid becoming 'gas locked'. Therefore, the operator requires certainty that the reservoir fluids to be lifted are mainly liquids prior to running a completion with a downhole pump.

As it is not possible to be certain of the reservoir fluids that will be encountered in an exploration well, a gas lift may be necessary to evacuate the borehole of wellbore liquids to flow reservoir fluids into the well to ascertain their composition in the first instance. Furthermore, if the reservoir liquids are known to have a high concentration of gas, a downhole pump would not be run but a means to evacuate the wellbore of liquids maybe required. In this instance a gas lift may be deemed the most effective method.

Once at surface, natural gas and produced fluids will be diverted by temporary pipework to a three-phase separator, which will separate out condensate, formation water and associated natural gas.

Condensate, which for clarity is not a waste, will be diverted via temporary pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to a permitted refinery for sale.

Formation water, which is considered a waste, will be diverted via temporary pipework to dedicated storage tanks onsite for subsequent offsite removal by a licenced haulier to 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.

Any natural gas separated during the three-phase separation will be managed in accordance with the identified BAT as identified within the Waste Gas Management Plan (10 – Waste Gas Management Plan).

8.8 Well Abandonment and Partial Well Abandonment

In the event that the well is not successful in establishing commercially producible petroleum or the well comes to the end of its producing life, the well will be abandoned in accordance with Offshore Energies UK (OEUK) Guidelines for the suspension and abandonment of wells [\[Ref.15\]](#).

In addition to the OEUK 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;
- Offshore Installations and Wells (Design & Construction) Regulations 1996; and
- Any other legislation relevant at the time.

The Oil and Gas UK guidelines stipulate a well must be constructed by taking into consideration the abandonment of the borehole. Therefore, the initial design and construction of the well(s) 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.

Based on a borehole construction, which complies with the OEUK 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). 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.

The abandonment of the Weaverthorpe-1 Well and restoration of the Wellsite is anticipated to last no more than six (6) weeks.

9. EXTRACTIVE WASTE MANAGEMENT

An assessment of the potential extractive waste arising from the proposed permitted activities has been undertaken.

The information obtained as part of the initial assessment includes each extractive waste's classification, quantity and storage method together with the prevention, minimisation, treatment and disposal options as required by the MWD.

The activities, which result in the production of extractive waste, are as follows:

- Drilling activities including the drilling of the Weaverthorpe-1 Well.
- Near wellbore treatments including Nitrogen lifting and CO₂ lifting;
- WCU and short term well test.
- Well abandonment and/or partial well abandonment.

9.1 Waste Description and Management Arrangements

An assessment of the potential extractive waste arising from the exploratory operations has been undertaken. The potential waste, together with its classification, anticipated quantities, prevention, minimisation, treatment and disposal is provided within this section.

- Table 4 – Waste Clays and Sand;
- Table 5 – Well Suspension Brine;
- Table 6 – Water Based Drilling Fluid (Fresh Water);
- Table 7 – Water Based Rock Cuttings (Fresh Water);
- Table 8 – Water Based Drilling Fluid (Chloride Containing Drilling Fluid);
- Table 9 – Water Based Rock Cuttings (Chloride Containing Drilling Fluid);
- Table 10 – Cement;
- Table 11 – Carbon Dioxide;
- Table 12 – Nitrogen;
- Table 13 – Formation Water / Produced Water; and
- Table 14 – Natural Gas (Incinerated by a Shrouded Ground Flare).

9.2 Waste Description Tables

Waste Clays and Sand				
Waste Classification, Quantity and Storage	Default Classification:	Non-Hazardous	EWC Code:	01 04 09
	Potential Classification:	Hazardous	EWC Code:	01 05 06*
	Estimated Quantity:	20 Tonnes	Dust / Odour Potential:	Limited Potential
	Onsite Storage:	Storage Container	Storage Duration:	<2 Weeks
Operation / Activity	The drilling of the borehole will commence with the drilling and installation of a surface conductor. The near surface clays and sands within which the surface conductor casing will be set will be removed. The clay and sand will be circulated out of the well using either an auger or water-based drilling fluids and return to the surface where it is transferred to an open tank.			
Prevention and Minimisation	The ability to prevent or minimise clay and sand is limited given that the formation needs to be removed to allow the conductor casing to be installed.			
Treatment and Disposal	The clay and sand will be transported offsite via licenced haulier to a permitted facility for treatment and reuse.			
Remaining in the Formation	None, all clay and sand shall be removed to allow the conductor casing to be installed.			
Monitoring	The Operator provides onsite competent supervision to ensure the operation be carried out in accordance with an approved drilling programme. An inspection of the storage tanks that contain the waste clay and sand shall be carried out prior to being used and will be subject to regular visual inspections and annual thickness checks.			

Table 4: Waste Table – Water Clays and Sand

Well Suspension Brine				
Classification, Quantity and Storage	Default Classification:	Non-Hazardous	EWC Code:	01 05 08
	Potential Classification:	Hazardous	EWC Code:	01 05 06*
	Estimated Quantity:	25 Tonnes	Dust / Odour Potential:	Limited Potential
	Onsite Storage:	Enclosed / Partially Enclosed Storage Tank	Storage Duration:	<2 Weeks
Operation / Activity	The well may be the subject of a period of suspension, which is undertaken using brine. In addition, brine is also used as circulation fluid following well treatments to recover spent treatment additives such as acid. Following suspension or circulation operations, the brine will be circulated out of the well to an onsite storage tank. Brine remaining within the well during suspension operations is not considered a waste as it is serving a 'well control' function.			
Prevention and Minimisation	The suspension brine will be stored onsite for subsequent reuse if it is required at a later date.			
Treatment and Disposal	Once the suspension fluid has fully served its purpose, it 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.			
Remaining in the Formation	None. Suspension brine is circulated out prior to well testing and decommissioning operations.			
Monitoring	An inspection of the storage 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 5: Waste Table – Well Suspension Brine

Water Based Drilling Fluids (Fresh Water)				
Waste Classification, Quantity and Storage	Default Classification:	Non-Hazardous	EWC Code:	01 05 04
	Potential Classification:	Hazardous	EWC Code:	01 05 06*
	Estimated Quantity:	25 Tonnes	Dust / Odour Potential:	Limited Potential
	Onsite Storage:	Enclosed / Partially Enclosed Storage Tank	Storage Duration:	<2 Weeks
Operation / Activity	Drilling fluids are used to aid the drilling process by lubricating the drill bit, circulating rock cuttings to surface and by maintaining a prescribed hydrostatic pressure within the well to prevent the uncontrolled release of natural gas or formation pressure.			
Prevention and Minimisation	Drilling fluid waste is minimised by continually reusing the drilling fluid in a closed loop system, sustained by filtering out any rock cuttings and/or 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 drilling fluid system.			
Treatment and Disposal	Drilling fluid becomes a waste when it is no longer required in the operation and will be transferred from the circulating mud system on the drilling rig to a vacuum tanker for removal offsite via licenced haulier to a permitted facility for treatment.			
Remaining in the Formation	None, all drilling fluid shall be circulated out.			
Monitoring	The Operator provides onsite competent supervision to ensure the operation be carried out in accordance with an approved drilling programme. An inspection of the storage tanks that contain the water based drilling fluid shall be carried out prior to being used and will be subject to regular visual inspections and annual thickness checks.			

Table 6: Waste Table – Water Based Drilling Fluids (Fresh Water)

Water Based Rock Cuttings (Fresh Water)				
Waste Classification, Quantity and Storage	Default Classification:	Non-Hazardous	EWC Code:	01 05 04
	Potential Classification:	Hazardous	EWC Code:	01 05 06*
	Estimated Quantity:	20 Tonnes	Dust / Odour Potential:	Limited Potential
	Onsite Storage:	Enclosed / Partially Enclosed Storage Tank	Storage Duration:	<2 Weeks
Operation / Activity	Drilling muds 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.			
Prevention and Minimisation	The ability to prevent or minimise rock cuttings recovery 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 hole size required to install each string of casing which in turn keeps the waste recovery to a minimum. The rock cuttings tank is a fluid separator tank (perforated false floor), which allows drilling mud coating the rock cuttings to percolate down through the false floor where it is collected and pumped back into the closed loop mud system.			
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. Rock cuttings are transported offsite via a licenced haulier to an Environment Agency permitted composting facility where it is blended into compost after the compost has been sanitised.			
Remaining in the Formation	None. Extractive process only.			
Monitoring	The Operator provides onsite competent supervision to ensure the operation be carried out in accordance with an approved drilling programme. An inspection of the storage tanks that contain the rock cuttings shall be carried out prior to being used and will be subject to regular visual inspections and annual thickness checks.			

Table 7: Waste Table – Water Based Mud (Fresh Water)

Water Based Drilling Fluid (Chloride Containing Drilling Fluid)				
Waste Classification, Quantity and Storage	Default Classification:	Non-Hazardous	EWC Code:	01 05 08
	Potential Classification:	Hazardous	EWC Code:	01 05 06*
	Estimated Quantity:	100 Tonnes	Dust / Odour Potential:	Limited Potential
	Onsite Storage:	Enclosed / Partially Enclosed Storage Tank	Storage Duration:	<2 Weeks
Operation / Activity	Drilling fluids are used to aid the drilling process by lubricating the drill bit, circulating rock cuttings to surface and by maintaining a prescribed hydrostatic pressure within the well to prevent the uncontrolled release of natural gas or formation pressure.			
Prevention and Minimisation	Drilling fluid waste is minimised by continually reusing the drilling fluid in a closed loop system, sustained by filtering out any rock cuttings and/or 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 drilling fluid system.			
Treatment and Disposal	Drilling fluid becomes a waste when it is no longer required in the operation and will be transferred from the circulating mud system on the drilling rig to a vacuum tanker for removal offsite via licenced haulier to a permitted facility for treatment.			
Remaining in the Formation	None, all drilling fluid shall be circulated out.			
Monitoring	The Operator provides onsite competent supervision to ensure the operation be carried out in accordance with an approved drilling programme. An inspection of the storage tanks that contain the water based drilling fluid shall be carried out prior to being used and will be subject to regular visual inspections and annual thickness checks.			

Table 8: Waste Table – Water Based Drilling Fluid (Chloride Containing Drilling Fluid)

Water Based Rock Cuttings (Chloride Containing Drilling Fluid)				
Waste Classification, Quantity and Storage	Default Classification:	Non-Hazardous	EWC Code:	01 05 08
	Potential Classification:	Hazardous	EWC Code:	01 05 06*
	Estimated Quantity:	500 Tonnes	Dust / Odour Potential:	Limited Potential
	Onsite Storage:	Storage Container	Storage Duration:	<2 Weeks
Operation / Activity	Drilling muds 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.			
Prevention and Minimisation	The ability to prevent or minimise rock cuttings recovery 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 hole size required to install each string of casing which in turn keeps the waste recovery to a minimum. The rock cuttings tank is a fluid separator tank (perforated false floor), which allows drilling mud coating the rock cuttings to percolate down through the false floor where it is collected and pumped back into the closed loop mud system.			
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. Rock cuttings are transported offsite via a licenced haulier to an Environment Agency permitted composting facility where it is blended into compost after the compost has been sanitised.			
Remaining in the Formation	None. Extractive process only.			
Monitoring	The Operator provides onsite competent supervision to ensure the operation be carried out in accordance with an approved drilling programme. An inspection of the storage tanks that contain the rock cuttings shall be carried out prior to being used and will be subject to regular visual inspections and annual thickness checks.			

Table 9: Waste Table – Water Based Mud (Chloride Containing Drilling Fluid)

Cement				
Waste Classification, Quantity and Storage	Default Classification:	Non-Hazardous	EWC Code:	17-01-01
	Potential Classification:	N/A	EWC Code:	N/A
	Estimated Quantity:	25 m ³	Dust / Odour Potential:	Limited Potential
	Onsite Storage:	Skips	Storage Duration:	<2 Weeks
Operation / Activity	On completion of hydrocarbon production from the well, it is plugged and abandoned. Cement returns from the casing of the well may result in waste cement. In addition, not all cement made at site may be used and therefore some may be surplus.			
Prevention and Minimisation	Careful planning will be taken prior to any cement operation being undertaken 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.			
Treatment and Disposal	Excess returns to surface will be transferred to a number of open top builder's skips onsite for subsequent removal and disposal to an Environment Agency permitted waste facility where it recycled as building rubble for use within the building industry.			
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	The Operator provides onsite competent supervision to ensure the operation be carried out in accordance with an approved cementing programme. An inspection of the open top builder's skips that contain the cement waste shall be carried out prior to being used and will be subject to regular visual inspections checks.			

Table 10: Waste Table – Cement

Carbon Dioxide (CO ₂)				
Waste Classification, Quantity and Storage	Default Classification	Inert	EWC Code:	N/A
	EWC Code	N/A	EWC Code:	N/A
	Estimated Quantity	Unknown	Dust / Odour Potential:	Limited Potential
	Onsite Storage	N/A	Storage Duration:	N/A
Operation / Activity	Liquid Carbon Dioxide is injected into the well to assist in the removal of all wellbore fluids and near wellbore debris sustained during the drilling operation, thus restoring near wellbore permeability.			
Prevention and Minimisation	The use of liquid Carbon Dioxide can be classified as a closed loop system, having first been extracted from the atmosphere during its manufacturing process where it is cooled to a liquid state before being injected into the well. The temperature of the formation changes the state of the Carbon Dioxide from a liquid to a gas, which is then returned to surface and vented back into the atmosphere.			
Treatment and Disposal	Carbon Dioxide that has been extracted from the atmosphere will be vented back into the atmosphere via the ground flare without any treatment being necessary.			
Remaining in the Formation	None. Liquid Carbon Dioxide injected into the well to assist in the removal of wellbore fluids and near wellbore debris will flow to surface in a gaseous state.			
Monitoring	The volumes of Carbon Dioxide will be monitored both in and out of the well.			

Table 11: Waste Table – Carbon Dioxide

Nitrogen				
Waste Classification, Quantity and Storage	Default Classification:	Inert	EWC Code:	N/A
	Potential Classification:	N/A	EWC Code:	N/A
	Estimated Quantity:	Unknown	Dust / Odour Potential:	Limited Potential
	Onsite Storage:	N/A	Storage Duration:	N/A
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.			
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.			
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.			
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 12: Waste Table – Nitrogen

Formation Water / Produced Water				
Waste Classification, Quantity and Storage	Default Classification:	Non-Hazardous	EWC Code:	16 10 02
	Potential Classification:	Hazardous	EWC Code:	16 10 01
	Estimated Quantity:	75 m ³	Dust / Odour Potential:	Limited Potential
	Onsite Storage:	Enclosed / Partially Enclosed Storage Tank	Storage Duration:	N/A
Operation / Activity	Formation water may be produced together with hydrocarbons. Formation water is separated using fluid separation equipment and transferred to cylindrical storage tanks located onsite for offsite removal. The formation water 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 radionuclides analysis by gamma spectrum.			
Prevention and Minimisation	The ability to prevent or minimise recovery of formation water is extremely limited. Formation water cannot be reused onsite due to unknown components within the formation water and high salinity.			
Treatment and Disposal	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 or a bespoke RSR permitted waste treatment facility where it is processed, treated and discharged in accordance with the permitted controls of the treatment facility.			
Remaining in the Formation	None. Formation water naturally occurs within the formation and is only considered as a waste when produced from the well.			
Monitoring	A contamination monitoring programme will be devised and include the wellhead, separator equipment and storage tanks. 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 weekly inspections and annual thickness checks.			

Table 13: Waste Table – Formation Water / Produced Water

Natural Gas (Incinerated by a Shrouded Ground Flare)				
Waste Classification, Quantity and Storage	Default Classification:	Hazardous	EWC Code:	16 05 04*
	Potential Classification:	N/A	EWC Code:	N/A
	Estimated Quantity:	>10 Tonnes per Day	Dust / Odour Potential:	Some Potential
	Onsite Storage:	Enclosed / Partially Enclosed Storage Tank	Storage Duration:	N/A
Operation / Activity	During the short term well test, natural gas is produced from the formation and flowed at different rates to determine the characteristics of the formation, allowing for the determination on whether or not the reservoir is capable of producing commercial quantities of natural gas.			
Prevention and Minimisation	The ability to prevent or minimise natural gas is extremely limited during this operation, as it is required to determine the condition and state of the reservoir.			
Treatment and Disposal	Natural gas is separated from produced fluids at surface and diverted via pipework to the Shrouded Ground Flare located onsite for incineration.			
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	An inspection of the relevant plant shall be carried out prior to being used and will be subject to regular inspections and maintained in accordance with manufacturers recommendations. During the short term well test operations the Shrouded Ground Flare will be supervised during periods of flaring activity to ensure its effectiveness to incinerate the natural gas. In addition, air emissions monitoring will be carried out and includes: - Hydrogen Sulphide (H₂S); - Sulphur Dioxide (SO₂); - BTEX / VOCs; - Nitrogen Oxide (NO); - Methane (CH₄); and - Ozone (O₃).			

Table 14: Waste Table – Natural Gas

Drilling mud may require treatment within the site boundary. An assessment of the potential waste treatment processes confirms that an 'installation activity' would not be required, as the treatment plant will not include a capacity exceeding:

- 50 tonnes per day for non-hazardous waste for disposal - using chemical, biological or physical treatment;
- 75 tonnes per day for non-hazardous waste for recovery - using biological treatment; or
- 10 tonnes per day for hazardous waste.

Drilling mud will form part of a closed loop system with treatment of the mud being limited to physical treatment to filter out cuttings to prolong the use of the mud and reduce overall waste mud volumes. The treatment is not for disposal purposes but rather ongoing recovery.

10. MANAGEMENT OF NON-EXTRACTIVE WASTE

Throughout the various phases of the development, non-extractive wastes will be generated onsite, which may include, but is not limited to:

- Surface run-off water (clean, unpolluted rainwater);
- Waste water and sewage;
- Potential minor fuel oil spills;
- Waste engine, gear and lubricating oils;
- Waste hydraulic oils;
- Oil rags and absorbents;
- Waste oil filters;
- Paper and cardboard;
- Canteen waste;
- Cement;
- Wood;
- Mixed Municipal waste; and
- Metal.

10.1 Treatment of Non-Extractive Waste

Non-extractive wastes will not be treated at the Wellsite. Non-extractive waste will be segregated and stored according to their EWC pending collection and will be transported offsite by a licensed road haulier to an Environment Agency licensed waste treatment / waste disposal facility.

10.1.1 Waste Supervision and Carriers

The Operator is ultimately accountable for waste management at the Wellsite. During operations, the management of waste generated at the Wellsite will be delegated to the Wellsite Supervisor, appointed by the Operator to exercise overall control of the wellsite operations, in accordance with the BSOR1995 and WR2011.

The management of waste onsite will include:

- Management of waste in accordance with the waste hierarchy, as set out in WR2011;
- 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.

The Operator will appoint competent waste dealers or brokers and carriers, responsible for the transportation of all waste streams to the relevant Environment Agency permitted waste treatment facility. Waste dealers or brokers and carriers will hold relevant certificates issued by the Environment Agency, which shall be inspected prior to being appointed.

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11. MANAGEMENT OF NATURALLY OCCURRING RADIOACTIVE MATERIAL

Any formation water produced during the short term well test 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 BAT.

A competent Radiation Protection Supervisor and/or Radioactive Waste Advisor has been appointed to ensure that NORM is managed correctly.

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12. RISKS POSED TO THE ENVIRONMENT AND HUMAN HEALTH

The risks posed by the proposed operations have been assessed as part of the application for an environmental permit.

The risks posed by the proposed 'permitted activities' have been considered within the Environmental Risk Assessment which forms part of any application to the Environment Agency and is considered an 'operating technique'.

The Environmental Risk Assessment (which is qualitative) considers activities that have the potential to cause harm to the environment and human health (pollution damage).

In addition, the Operator has employed the services of specialist consultants to address the risks posed specifically to air, groundwater, surface water and noise. Each impact assessment / risk assessment will be verified by the Environment Agency as part of the permit determination process.

A copy of the following assessments are provided in support of the environmental permit application:

1. Environmental Risk Assessment (07 – Environmental Risk Assessment);
2. Hydrogeological Risk Assessment (08 - Hydrogeological Risk Assessment);
3. Air Quality Impact Assessment (11 – Air Quality Impact Assessment); and
4. Noise and Vibration Impact Assessment (12 – Noise and Vibration Impact Assessment).

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13. POINT SOURCE EMISSIONS

There are a number of point source emissions identified within the Wellsite comprising of emissions to air and groundwater.

13.1 Point Source Emissions to Air

There are a number of point source emissions to air identified within the Wellsite. The primary emission point is the Shrouded Ground Flare used to incinerate waste gas.

The point source emissions are detailed within the Site Plans document (04 – Site Plans) provided in support of the environmental permit application.

13.2 Point Source Emissions to Surface Water

Schedule 21 of EPR2016 relates to water discharge activities, including the discharge or entry to inland freshwaters, coastal waters or relevant territorial waters of any trade effluent.

For clarity, the Environment Agency has provided the following response with regards to surface water discharges in their pre-application response:

‘Please note that with regards to the water discharge activity, providing that the water discharged from the site is only unpolluted rainwater and you are taking necessary measures to prevent pollution we would not regulate this as a Schedule 21 water discharge activity. We may put additional restrictions on discharge to the site during well workover or testing phases.’

The Operator is proposing to discharge only ‘clean’ surface run-off water from the Wellsite and therefore a surface water discharge permit will not be applied for.

The discharge of ‘clean’ surface run-off water from the Wellsite will be the subject of a Surface Water Management Plan (13 – Surface Water Management Plan) provided in support of the environmental permit application.

For clarity, the Operator is not proposing to discharge surface run-off water during Phase 2 and Phase 3 operations. Surface run-off water collected within the perimeter ditch during Phase 2 (drilling operations) and Phase 3 (short term well test) will be transferred off site by an Environment Agency licenced waste contractor to an Environment Agency licensed waste treatment facility.

In the event that the Weaverthorpe-1 Well is a success case, ‘clean’ surface run-off water will be discharged to surface through a Class 1 Interceptor which will be installed following a successful short term well test phase of operations.

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14. WELLSITE MANAGEMENT

14.1 Foul Water and Sewage

The proposed development does not require nor does it propose the installation of a permanent connection to the existing sewerage system. During short duration operations, such as drilling, and short term well testing operations, when the number of personnel onsite will be at its greatest, temporary welfare facilities will be provided onsite, each facility having an independent under-unit sewage tank.

For clarity, no sewage will be directed to any watercourse.

Sewage will be collected routinely 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.

14.2 Wellsite Monitoring

The Operator is responsible for the day to day monitoring of the Wellsite during the proposed operations.

The nominated Supervisor on site will identify potential leaks and emissions from site equipment and materials stored within the Wellsite 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 short duration operations, such as drilling, and short term well test operations, the supervision of the Wellsite will be delegated to the Wellsite Supervisor, appointed by the Operator to exercise overall control of the wellsite operations, in accordance with the BSOR1995 and WR2011.

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 Wellsite. The Wellsite Supervisor will 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 proposed 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.

14.3 Contractor Performance

The Operator is ultimately responsible for any waste generated onsite during the short duration operations and 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 Operator's own Safety and Environmental Management System.

14.4 Security

Security of the Wellsite is provided in the form of a 2m high security fence and lockable access gates. Security facilities will be in place as required, and as set out on the phase layout plans.

Manned security will control access and egress to the Wellsite and 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 BSOR1995.

14.5 Complaints

In the event that a complaint is received from stakeholders, including neighbours, the complaint shall be recorded and investigated in accordance with the Operator's own Safety and Environmental Management System.

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.

14.6 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 BSOR1995, 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 for in three ways: -

1. By the secondary bunding installed for key process areas.
2. By the raised perimeter bund, that provides significant fluid containment for the site area.
3. By the impermeable membrane incorporated in to the design of the Wellsite.

Additional water will be available onsite and should be used to keep areas adjacent to the fire cool to avoid any damage being sustained to the impermeable membrane.

14.7 Incident Reporting and Investigation

All incidents, no matter how minor, are reported in accordance with the Safety and Environmental Management System. A procedure therein provides 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.

15. PROPOSED PLAN FOR CLOSURE AND SITE AFTERCARE

Prior to site closure, abandonment of the well and restoration of the Wellsite, a Site Closure Plan will be developed by the Operator and submitted to the Environment Agency for approval.

As a minimum, the Site Closure Plan will consider both the decommissioning and abandonment of the well(s) and the restoration and aftercare of the Wellsite.

15.1 Well Abandonment and Decommissioning

Upon cessation of activities the well will be abandoned in accordance with industry guidance, in force at the time of well decommissioning. Current industry guidance 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.

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.

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.

Once the well is abandoned, the casing strings will be mechanically cut off at 1.5 m 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.

In addition to industry guidance the well abandonment(s) will be undertaken in accordance with BSOR1995 and DCR1996 and all other applicable industry guidance and standards and reviewed by independent well examiner.

15.2 Restoration and Aftercare

All extractive waste shall be removed from the Wellsite prior to restoration.

All surface equipment will be purged clean, dismantled and removed from the Wellsite. Buildings and structures will be demolished and removed. The containment systems and associated management of surface water will continue to be implemented until all equipment has been removed from the site.

Plant and structures shall be removed from the site; the site surface will be inspected for contaminants and placed within skips pending collection. Any material which shows evidence of contamination shall be segregated and collected independently of its uncontaminated counterparts.

Samples will be obtained throughout the restoration process to demonstrate that there has been no deterioration to the environment. Samples taken will include surface water, groundwater and soil analysis.

The results of the monitoring will form part of the Site Condition Report, which will be issued to the Environment Agency upon an application to surrender the environmental permit.

Upon completion of the restoration phase, the site will be the subject of an aftercare programme to ensure the condition of the land is comparable with adjacent land and its pre-development condition.

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12. The Offshore Installations and Wells (Design & Construction, etc) Regulations 1996 (DCR1996)
Available at: <https://www.legislation.gov.uk/uksi/1996/913/contents>
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Available at: <https://www.legislation.gov.uk/uksi/2011/988/contents>
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