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Teeside Renewable Energy Plant



Port Clarence Energy Limited

Odour Management Plan

Document approval

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Management Summary

Port Clarence Energy Limited (PCEL) are applying to the Environment Agency (EA) for a variation to their current Environmental Permit (EP) for the Teeside Renewable Energy Plant (the Facility), on Koppers Road, Huntsman Drive, Port Clarence, Stockton on Tees, TS2 1TT. The EP variation application is to convert the Facility from a waste biomass fuelled facility (waste co-incineration facility) to a waste incineration facility.

This Odour Management Plan (OMP) has been produced in support of the development for the Facility, in order to provide details on the provisions which have been taken into account within the design of the Facility to mitigate the risk of nuisance from odour through the commissioning and operational phase of the Facility. It also takes into consideration the risk of fugitive emissions from abnormal and unplanned events, which would include fires and other emergency events.

The Facility will be designed in accordance with the recommended best practice and UK odour management guidance, including the following:

- EA Sector Guidance Note S5.06: *'Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*;
- EA Guidance Note H4: *'Odour Management - How to comply with your environmental permit'*;
- *'An industry guide for the prevention and control of odours at biowaste processing facilities'*, The Composting Association, 2007; and
- *'Odour Guidance for Local Authorities'*, DEFRA, March 2010.

During normal operations, the potential sources of odour are from the odour stack, the main stack, and fugitive emissions from the fuel reception and storage building and reagent, ash and residue storage and handling buildings.

The principal control measures for the mitigation of odours from the Facility are summarised as follows:

- The fuel reception area and storage building will be enclosed and maintained at a negative pressure at all times.
- Air from the fuel reception and storage building and conveyor system will be extracted and processed within the odour abatement system which includes a carbon filter, and emitted for dispersion to the atmosphere via the odour stack.
- Air emitted from the main stack will have low odours because potential odours will have been combusted at high temperatures which is likely to destroy the majority of odours, and any residual odours will be further abated within the flue gas treatment (FGT) system prior to release from the stack.
- Reagent, ash and residues have dedicated storage areas with suitable secondary containment.

Arrangements and responsibilities for the monitoring, reporting, and response to any complaints of odour from the Facility have been identified.

Following completion of detailed design, a system for the periodic review of this OMP is proposed. Any changes to the requirements of this OMP will be submitted to and formally agreed with the EA prior to their implementation.

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1 Introduction

1.1 Background

Port Clarence Energy Limited (PCEL) is applying to the Environment Agency (EA) for a variation to the Environmental Permit (EP) for the Teeside Renewable Energy Plant (the Facility), on Koppers Road, Huntsman Drive, Port Clarence, Stockton on Tees, TS2 1TT. The EP variation application is to convert the Facility from a waste biomass fuelled facility (waste co-incineration facility) to a waste incineration facility, for the processing of RDF as the primary fuel.

During initial pre-application discussions, the EA has advised that an Odour Management Plan (OMP) should be submitted in support of the application. Therefore, this OMP has been produced to support the proposed conversion of the Facility, in order to provide details on the provisions which have been incorporated into the design of the Facility to mitigate the risk of off-site impacts from odour through the commissioning and operational phase of the Facility.

The Facility will be designed in accordance with recommended best practice and UK odour management guidance, including the following:

- EA Sector Guidance Note EPR 5.01: *'Incineration of Waste'*;
- EA Sector Guidance Note S5.06: *'Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*;
- EA Guidance Note H4: *'Odour Management - How to comply with your environmental permit'*;
- *'An industry guide for the prevention and control of odours at biowaste processing facilities'*, The Composting Association, 2007; and
- *'Odour Guidance for Local Authorities'*, DEFRA, March 2010.

1.2 Objective

The objective of this OMP is to identify the abatement measures which have been allowed for in the design of the Facility and the management systems which will be implemented to prevent any unacceptable off-site impacts associated with emissions of odour from the Facility.

2 Site Location and Description

2.1 The site

The site, which extends to an area of some 5.33 hectares (13.17 acres), is located on land at Clarence Works, to the north west of Koppers UK, Port Clarence on the north side of the River Tees.

The northwest boundary of the site is formed by a railway line devoted to industrial cargo traffic. Further to the north lies an area of salt marsh and sunken brine pools that make up much of the natural habitat of the area. The Transporter Bridge stands some 880m to the west south west of the site. Middlesbrough Football Club's Riverside Stadium is situated almost directly to the south of the site on the south bank of the River Tees, some 780m from the site.

Clarence Works is an industrial area with a long history of heavy industry and port related works. The last previous use for the site was as a workshop, but this ended over 50 years ago. Prior to being a workshop, the site was used for steel production. The site and land surrounding has a long and complex industrial history, including: chemical manufacturing; railways; iron works; coal storage, petroleum oil and gas refining; and petroleum, oil and gas storage.

Koppers UK, previously known as Bitmac, is a bitumen processing plant. The site has now been developed with only minor works required to complete the conversion to processing RDF.

The site is presently accessed from the east via a private road which leads to Huntsman Drive which in turn leads to A178, linking northwards to the A1185 and from there westwards towards the A19, A689 and A1(M). This is the designated HGV route from the A19 and A1(M) to Seal Sands.

A site location plan and installation boundary drawing are presented in Appendix A.

2.2 Summary of Site operations

The installation is based around 3 main buildings comprising the turbine hall and boiler house, a fuel reception and storage building. Other main features of the plant include a stack of approximately 111 m in height and an air cooled condenser with additional ancillary infrastructure including;

1. 2 vehicle weighbridges;
2. Offices, control room and staff welfare facilities;
3. Site fencing and security barrier;
4. External hard standing areas for vehicle manoeuvring/parking;
5. Internal access roads and car parking;
6. Cooling fans;
7. Boiler sump;
8. Water tank;
9. Ammonia tank;
10. Flue gas treatment equipment;
11. Bottom ash storage and transfer area;
12. APCr ash silo (x2);
13. Lime silo;
14. Transformers; and
15. Grid connection compound.

The Installation will have a design thermal fuel input capacity of approximately 102 MWth through a single combustion line. As stated previously the installation will combust fuels with a range of net calorific values – 9.0 MJ/kg to 14 MJ/kg,

3 Review of Potential Sources, Pathways and Receptors

3.1 Odour

An odour is the organoleptic attribute perceptible by the olfactory organ on sniffing certain volatile substances. Odorous substances have a property which makes them perceptible to our sense of smell. The chemical compound (i.e. the 'odorant') is volatilised in air and acts as a stimulus which the receptor interprets as an odour.

Typically, odours are detected at very low concentrations of chemicals and compounds in air. The human nose is very sensitive with on average over 5 million scent receptors. Humans can detect concentrations as low as a few parts per billion (ppb).

Odours may be perceived as pleasant or unpleasant. The main concern with odour is its ability to cause a response in individuals that is considered to be objectionable or offensive. Whilst there is often agreement about what constitutes pleasant and unpleasant odours, there is a wide variation between individuals as to what is deemed unacceptable and what affects our quality of life.

3.1.1 Potential sources

The potential point source releases of odour from the Facility are:

- the main stack which releases the abated combustion gases post flue gas treatment;
- The odour abatement system stack, which releases air, extracted from the RDF storage hall, following abatement of odours;

The potential sources of intermittent or fugitive emissions of odour are:

- deliveries of incoming waste derived fuel, during unloading of fuel from waste delivery vehicles in the fuel reception hall;
- vehicle entry and egress from the fuel reception hall, considering the opening of roller doors;
- fuel reception areas have potential of releasing odours to the atmosphere during opening of roller doors or ventilation louvres;
- fuel reception emptying and cleaning;
- the boiler ash and air pollution control residues (APCr) storage area;
- chemical and reagent delivery and offloading (lime, PAC, ammonia);
- emergency releases from unplanned events such as fire
- chemicals used for odour masking; and
- vehicle exhausts.

It is noted that there are other industrial facilities in the area which have the potential to give rise to odour and the potential for in-combination effects. However, the primary focus of this report relates to the activities which are within PCEL's control.

3.1.2 Pathways

Odours released from the sources identified are released to air and have the potential to be conveyed to nearby receptors via transfer through the air. The extent to which odour is detectable is dependent upon the following factors, all of which can exhibit substantial variation over time:

- the nature and magnitude of odour emission released from the Facility;
- the wind direction and wind speed; and
- atmospheric turbulence (vertical and horizontal) and the level of dilution and dispersion odours undergo as they travel downwind.

For example, an odour is much less likely to be perceived when stood upwind of the source, compared to downwind. This is also altered by the strength of the wind and other air turbulence, which can be constantly changing. Therefore, it is unusual for a pathway to be constant, hence the often intermittent nature of odours.

3.1.3 Receptors

The surrounding area is primarily industrial. The closest residential receptor is approximately 840 m to the west of the odour stack. It is not expected for odours from the Facility to be unacceptable at this distance (normally a buffer of 500 m is used to identify odour receptors). However, a selection of the closest residential receptors in each wind direction surrounding the Facility has been used. These are the same residential receptors as used in the air quality assessment submitted with the permit variation application, for consistency.

4 Management and Control Measures

The conversion to processing RDF is subject to completion of detailed design and construction; however, where design information is not currently available, it has been considered within this OMP. Following completion of detailed design, this OMP will be reviewed and updated to include for any additional information in relation to the control measures to be implemented at the Facility. Detailed process design would be programmed following final contract negotiations with the contractors who will be undertaking the construction works.

Prior to commencement of commissioning of the Facility, a commissioning plan will be submitted to the EA for approval. This will include measures to be taken to prove performance of the odour abatement measures detailed in this section. The commissioning plan will include, but not be limited to the following:

- Confirmation of the management arrangements of the waste derived fuel materials imported into the Facility.
- The odour abatement systems which will be implemented throughout the commissioning phase of the Facility.
- Further details associated with the storage capacity of the fuel reception, with storage times of incoming waste derived fuel supplied on completion of detailed design of the Facility. The detailed design information will also be used to support the development of the final OMP.
- The development of waste derived fuel acceptance criteria that limit the types of fuel received at the Facility. This will be supplemented by monitoring of suppliers and the fuel being transferred to the Facility.
- Design and management of the mechanical ventilation system, including odour abatement system, to prevent the release of fugitive emissions from the Facility.
- Design of the building relating to separation and enclosure of building structures where odorous materials may be present, and management of the operation of access doors and ventilation louvres etc. within those areas.
- Identification and management of emergency situations.

4.1 Control measures

4.1.1 Point source emissions

During normal operation, there are two point source odour emissions from the Facility; from the odour stack and from the main emissions stack.

4.1.1.1 Odour stack

The odour stack will be the point source of air emissions following process within the odour abatement system. Air from the fuel reception and storage building will be extracted and ducted to be passed through the odour abatement system. The odour abatement system will comprise bag filters followed by activated carbon beds prior to release to atmosphere via a dedicated stack. The odour abatement system will be designed to operate continuously with the ability to change out the activated carbon once spent.

4.1.1.2 Main emissions stack

The Industrial Emissions Directive (IED) requires that any combustion gases passing through a waste incineration plant must experience a temperature of 850°C or more for at least two seconds. Due to the high temperatures associated with the combustion process, nearly all odorous chemicals will be destroyed. Any residual odorous chemicals will be abated in the bag filters of the flue gas treatment system.

Bag filters are highly effective at removing all sizes of particles and work via two methods:

- Absolute filtration - particles larger than the holes in the filter obviously cannot pass;
- Adsorption - a layer of particles called "filter cake" builds up on the surface of the filter material which consists of reagents (lime and activated carbon) and reaction products. This layer is essential to the proper functioning of the flue gas treatment system. Within this layer, the final acid gas neutralisation and the absorption of heavy metals and complex organic compounds takes place.

The main stack will assist with dispersion of the flue gases as demonstrated in the Air Quality Assessment. Taking this into consideration, it is considered highly unlikely that there will be any malodorous air from the Facility detectable at sensitive receptors.

To prevent fugitive odour emissions from a bag filter failure, there will be online monitoring of the pressure drop within bag filter compartments to identify when there has been bag filter failure. If a change in pressure drop is identified, the relevant bag filter compartments will be isolated to prevent uncontrolled emissions and repaired before being brought back on-line. The particulate abatement systems are designed with suitable redundancy which will enable the bag filters to be changed whilst the Facility is in operation without any reduction in performance of the particulate abatement systems.

An SNCR reagent (ammonia solution) will be injected into the furnace prior to the FGT process to abate NOx. As part of the SNCR system, there may be an occasional "ammonia slip" during operation. This refers to when ammonia salts are formed downstream in the flue gas path, and unreacted ammonia can be discharged to the atmosphere. This is controlled by employing systems to control the rate of reagent dosing to ensure that it is kept to a minimum. The impact of emissions of ammonia from the Facility have been assessed in the Air Quality Assessment submitted in support of the EP application. This has demonstrated that the emissions of ammonia from the Facility will have an 'insignificant' impact upon the environment.

The assessment and management of further abnormal events is detailed in section 6.

4.2 Fugitive emissions

4.2.1.1 Deliveries of fuel for processing

Deliveries of waste derived fuel to the Facility will be via road in enclosed vehicles. Waste derived fuel will not be unloaded until the delivery vehicles are located within the enclosed fuel reception and storage building. This will prevent the release of fugitive odour emissions during transport of the waste derived fuel to the Facility.

The fuel reception and storage building will have sufficient space for the inspection of waste derived fuel deliveries, if needed, and for the potential quarantine of any 'non-compliant' waste derived fuel. All fuel handling, transfer and treatment activities undertaken at the Facility will be contained and undertaken within environmentally controlled buildings which will maintain negative pressure, thereby minimising the potential for the release of fugitive odour emissions from the Facility.

The fuel reception and storage building will have fast opening doors to allow for waste derived fuel deliveries, and a door control system for vehicles entering or leaving the area will be provided, to limit the number of delivery doors and ventilation louvres open at any time to ensure that negative pressure is maintained in the fuel reception and storage building.

The tipping hall will have four tipping bays, although it is not expected for all four tipping bays to be used simultaneously. When delivering waste derived fuel to the Facility, delivery vehicles will reverse into an assigned tipping bay and unload their waste derived fuel into the fuel storage building.

If the waste derived fuel is identified as being 'unacceptable', it will be either rejected and returned to the supplier or quarantined within a dedicated quarantine area prior to transfer off-site. Investigations will be undertaken with the fuel supplier to identify the reason for malodorous materials being imported into the site, and appropriate actions taken to prevent reoccurrence.

In the event these control measures do not minimise the release of fugitive odour emissions, the measures detailed within the action plan (refer to section 7) will be implemented.

4.2.1.2 Waste derived fuel storage areas

There will be four induced draught extraction fans within the odour abatement system, used to maintain negative pressure within the fuel reception and storage building. This will ensure that odour is unable to escape from the fuel reception and storage building. As there are multiple fans, this allows for the continued operation of the odour extraction system should one fail. This is assessed and planned for within section 6 – Abnormal vents.

Anaerobic conditions can lead to the generation of odorous air within the fuel storage building. Incoming waste derived fuel delivered to the Facility will be stored in the fuel storage area for the minimum period of time to prevent the formation of anaerobic conditions within the fuel storage area. The continuous operation of the Facility will minimise the storage times for waste derived fuel within the fuel storage building. Fuel reception areas will be cleared and cleaned during regular maintenance operations. The assessment and management of further associated abnormal events is detailed in section 6.

Where appropriate, prior to periods of planned maintenance, waste derived fuel stored within the fuel reception and storage building will be 'run-down' so that it does not contain significant quantities of old and potentially odorous material during planned shutdown periods. In the event of an extended period of unplanned shutdown, arrangements will be made to stop or divert incoming fuel to the Facility. If required, there is potential to remove and backload waste derived fuel from the bunker in the case of an extended unplanned shut down. In addition, it should be noted that there will be no external handling or storage of waste derived fuel associated with the operation of the Facility.

In addition, during periods of shutdown, the doors to the fuel reception area will remain closed to contain potential fugitive odour emissions, with incoming waste derived fuel stopped or diverted to an alternative treatment facility. The assessment and management of further associated abnormal events is detailed in section 6.

4.2.1.3 Reagent chemical storage and handing

Ammonia, lime and powdered activated carbon (PAC) are used within the FGT system.

Ammonia solution will be stored within a tank in a dedicated storage area, with secondary containment such as bunding. The ammonia solution will be delivered into the storage tank from a

road tanker. When filling the tank, displaced air will be routed back to the road tanker so there is no escape of potentially odorous air.

Lime and PAC will be stored in separate steel silos adjacent to the FGT system. Lime and PAC will be transported pneumatically from the delivery vehicle to the correct storage silo. Exhaust air will be de-dusted using a fabric filter located at the top of the silo – cleaning of the filter will be done automatically with compressed air after filling operations, with the filter inspected regularly for leaks. Silos will also be fitted with high-level alarms.

Fuel/gas oil will be used as the start-up and shutdown fuel by the auxiliary support burners. It will be stored in a dedicated storage tank with suitable secondary containment. Fuel/gas oil will be delivered into the storage tank from a road tanker. When filling the tank, displaced air will be routed back to the road tanker so there is no escape of potentially odorous air.

Boiler feed water will be supplied from an onsite water treatment plant. Boiler water treatment chemicals will be used to control water hardness, pH and scaling and will be delivered in sealed containers and stored in an area with suitable secondary containment (e.g. bunding) within the water treatment room. Various maintenance materials (oils, greases, insulants, antifreezes, welding and firefighting gases etc.) will be stored in an appropriate manner. Any gas bottles on-site will be kept secure in dedicated area(s).

4.2.1.4 IBA storage and handling

Due to the high temperatures, any organic substances within the waste derived fuel will have been destroyed within the combustion process. Therefore, the incinerator bottom ash (IBA) is not odorous and will be managed within the confines of the Facility building within the IBA storage area/building.

IBA is initially wet, or quenched, which both cools the ash and reduces any dust emissions. IBA will then be stored within the enclosed IBA storage and handling building. There will be regular collections of IBA from the IBA storage area for transfer off-site to a suitably licensed waste facility. All ash handling will be undertaken within enclosed buildings, with the ash maintained wet from quenching to prevent the release of dust emissions off site. IBA will be loaded into articulated lorries by front-end loader, within the enclosed IBA storage area.

4.2.1.5 APCr storage and handling

Due to the high temperatures of 850°C or higher, any organic substances within the waste derived fuel will have been destroyed at the high temperatures within the combustion process. Furthermore, the ammonia dosed in the NO_x abatement system will not be dosed into the flue gas stream until after the bag filters. Therefore, the ammonia will not be present in the APCr and will not be odorous.

APCr will be stored within sealed/enclosed silo(s). All silos will be fitted with bag filter protection to prevent the uncontrolled release of dusts during refilling. Maintenance procedures will be developed for routine inspection and testing of the bag filters. The APCr silo will be unloaded by a chute system. Dusty air from the unloading of silo will be extracted and vented to atmosphere via bag filters fitted to prevent the release of dusts from silo unloading operations.

5 Odour monitoring

A programme of odour monitoring will be undertaken at the Facility. This will include the following monitoring regime:

- Olfactory (sniff) testing at the installation boundary; and
- Continuous wind direction and wind speed monitoring using an anemometer.

5.1 Olfactory testing

Olfactory (sniff) testing will be undertaken at strategic locations around the installation boundary on a regular basis. Where odours at the perimeter are identified, this will be reported to Facility's management team. An investigation to determine the source and cause of the odour will be undertaken in accordance with the systems as set out in section 7.

5.1.1 Competent individuals

In order to ensure repeatability of the odour monitoring results, more than one competent odour assessor/member of staff will be on-site at all times. This will ensure that odour monitoring will continue if one individual is away or unavailable. Furthermore, as colds, sinusitis or sore throats can affect the sense of smell, having more than one trained individual will allow the monitoring to continue in the event of illness. However, if all individuals are suffering from illness etc then this fact will be recorded on the odour monitoring forms. PCEL will ensure that the number of trained individuals on-site at any one time, will not exceed four people so to maintain consistency of the results.

It is important for the individuals undertaking the monitoring to not spend, or have not spent, significant time in the waste derived fuel areas, as their sense of smell must not have become accustomed to the odours arising. These individuals should avoid strong foods or drinks (including coffee) for at least half an hour before conducting the monitoring. Furthermore, strongly scented toiletries and the use of deodorisers within vehicles will be avoided.

5.1.1.1 Monitoring locations

The proposed locations for odour monitoring are presented in Appendix C. The locations may be reviewed following detailed design to ensure that there are no accessibility constraints. Where accessibility constraints are identified, suitable equivalent locations which do not have the same accessibility constraints will be identified and agreed.

5.1.2 Monitoring frequency

In order to generate a detailed odour record for the Facility, regular monitoring at the installation boundary will be undertaken. This will ensure a detailed data set will be maintained throughout the year.

Monitoring will also be undertaken upon receipt of an odour complaint to identify and record the odours present at the time of the complaint – refer to section 7.

Monitoring will not be conducted at a set time of day, in order to maintain flexibility and relevance in the monitoring strategy. Instead, the monitoring will be conducted at times when there is a high risk of odour generation, such as during times where there are waste derived fuel deliveries to the site or residues collected for transfer off-site.

5.1.3 Data collection and recording

Before commencing any odour monitoring, the operative will record pertinent details such as date, time, weather conditions and the nature of the activities being undertaken. This is summarised within a proposed monitoring template, contained within Appendix D.

In order to quantify odour at a specific level, the 'intensity' and the 'offensiveness' are recorded. These are based on a scale of 1 to 5 for 'intensity' and 1 to 4 for 'offensiveness'. The levels for the two scales are shown in Table 1 and Table 2 below.

Table 1: *Odour Intensity*

Scale	Intensity Rating
0	No odour
1	Very faint odour (barely detectable, need to stand still and inhale facing into the wind)
2	Faint odour
3	Distinct odour (odour easily detectable while walking and breathing normally)
4	Strong odour
5	Very strong odour
6	Extremely strong odour (probably causing nausea)

Table 2: *Odour Offensiveness*

Scale	Offensiveness Rating
1	No detectable odour
2	Potentially Offensive
3	Moderately Offensive
4	Very Offensive

As well as recording the odour intensity and offensiveness, general comments on the nature of the odour will also be recorded, such as persistence, transience and potential source etc.

5.1.4 Action limits

If a score of 1 is recorded for intensity and offensiveness at a monitoring location, it is concluded that odour from the Facility cannot be detected and no action is required.

If a score of 2 or higher for intensity or 2 or higher for offensiveness is recorded, then a more detailed investigation will be undertaken into the activities being undertaken and the root cause of the odour, refer to section 7.1. This approach aims to identify the source of the odour and suggest possible ways to improve operations at the Facility to prevent odour being generated.

If further investigation is needed, all adjacent facilities to PCEL will be notified of the event and the corrective actions that will be undertaken to mitigate off site impacts.

5.1.5 Wind direction and wind speed

A weather centre including an anemometer will be used to record the wind direction and speed, ambient temperature, air pressure, and humidity, to provide data to inform any investigations into any odour or taint complaints which are received.

6 Abnormal Events

Table 3 identifies those potential abnormal events which may give rise to odour emissions, and planned responses in the event of these potential abnormal events.

Table 3: *Abnormal Events and Response Measures*

Event	Location	Likely Effect	Response Measures	Approximate Timescales for Response
Severely odorous waste derived fuel fuels received	Main process building	Increase in odour within the building while severely odorous waste derived fuel is present. Any fugitive emissions become more serious.	<p>Reject any waste derived fuel which is believed to be severely odorous and does not comply with the waste acceptance procedures, if this is identified before the delivery vehicle has left the site.</p> <p>If the delivery vehicle has left the site, immediately place severely odorous waste derived fuel in the designated quarantine area. Transfer this waste off-site to a suitably licensed waste management facility at the earliest opportunity.</p> <p>Additional deliveries of waste derived fuel from the waste producer may be suspended.</p> <p>If odour emissions are believed to be less severe and the waste derived fuel can be processed, prioritise processing of the waste derived fuel to reduce the duration of time it is stored within the main building.</p>	Immediate
Failure of the odour abatement extraction fan	Facility building	Reduction in negative pressure within the fuel reception, storage and building, and Increased odour concentrations within these areas.	Maintenance engineers sent to rectify the failure.	Immediate
			<p>The building management system will detect the reduction in negative pressure. The odour abatement system comprise of two separate systems, each system having 2 fans – so 4 fans in total. This ensures that the failure of one fan does not prevent the odour abatement system from operating.</p> <p>Facility operations suspended until the problem is rectified.</p>	One day

Event	Location	Likely Effect	Response Measures	Approximate Timescales for Response
			Incoming waste derived fuel stopped or diverted to an alternative waste treatment facility.	
Development of anaerobic conditions in the fuel storage building	Fuel reception and storage building.	Increase in odour within the fuel reception and storage building	Wastes are removed on a first-in, first out principle and during operation waste will be regularly mixed to avoid the development of anaerobic conditions.	Ongoing
Bag filter failure	FGT plant	Pressure drop change over the bag filters	The relevant bag filter compartments will be isolated to prevent uncontrolled emissions and repaired before being brought back on-line. This can be undertaken whilst the Facility is in operation without any reduction in performance of the particulate abatement systems.	Immediate
APC residues handling failure	FGT plant	Uncontrolled release of APCr from APCr handling infrastructure	Contained and sealed transfer systems. Impervious surfaces outdoors. Controlled drainage in areas where residues are stored. Emergency response procedures will be implemented. Clean-up of APCr.	Immediate
Plant breakdown	Any location	Risk of increased impact from any area of site where normal operations are affected during and after the breakdown	A supply of critical spares will be maintained on site. The site will employ maintenance engineers to enact any repairs.	Immediate
			If spares or engineers are not available, the relevant operations and their predecessors in the process will be suspended, if necessary, to prevent significant increase in odour emissions	Immediate
Spills during unloading of chemicals	Chemical storage areas	Risk of dusts and odours	Supervision of chemical unloading activities by competent staff. Impervious surfaces outdoors. High level alarms. Secondary containment for storage vessels.	Immediate

Event	Location	Likely Effect	Response Measures	Approximate Timescales for Response
			Emergency response procedures will be implemented. Clean-up of chemical spills.	
Overfilling of vessels	Chemical storage areas	Risk of dusts and odours	Supervision of chemical unloading activities by competent staff. Impervious surfaces outdoors. High level alarms. Secondary containment for storage vessels. Emergency response procedures will be implemented. Clean-up of chemical spills.	Immediate
Waste derived fuel storage failure	Fuel reception building and circulation roadways	Risk of dusts and odours	Emergency response procedures will be implemented. Clean-up of waste derived fuel.	Immediate
Fire	Any location	Risk of smoke, odour and dust release from burning material.	The fire prevention plan details the preventive measures, detection systems and response to fires. This will include notification to adjacent facilities and residents.	Immediate

In all instances where waste derived fuel processing is required to be suspended, the receipt of waste derived fuel at the Facility will be prohibited and incoming waste derived fuel will be stopped or diverted to an alternative suitably licenced waste treatment facility.

6.1 Emergency planning

This section lists the acknowledged occasions which may have the potential to result in higher odour emissions. Should any of these occur, details of the incidents, corrective actions implemented and mitigation measures to prevent re-occurrence will be communicated to adjacent premises where the incident has potential to impact upon them, as explained in section 6.2.

6.1.1 Abnormal meteorological conditions

Abnormal meteorological conditions such as low wind speed and high temperatures may promote elevated levels of odour either on the site or at nearby sensitive receptors. A wind direction towards sensitive receptors may increase odour levels. Conversely very low wind strength and temperature inversions may minimise dispersion and potentially create a build-up of odour. Elevated climatic temperatures during summer months may also increase odorous emissions.

6.1.2 Staffing issues

Human error and accidents may cause elevated levels of odour to be created either through the stopping or breakdown of the process or the failure of control equipment. Contingency mitigation measures will be developed as part of the detailed design, construction and commissioning of the Facility. This will include procedures to be implemented in case of staffing issues.

6.1.3 Planned odorous events

If at any time it will be necessary to undertake temporary actions that are likely to cause elevated levels of odour, PCEL will contact the EA, adjacent facilities and any other relevant stakeholders in advance to inform them of the operations being undertaken, the associated mitigation plans, and that the elevated levels of odour will be of a temporary nature. Where practicable, such actions will only proceed when the prevailing wind direction can be demonstrated to be away from sensitive receptors.

7 Action Plans/Contingencies

7.1 Complaint investigation

It is possible that odour incidents may be episodic and short-lived, so it is possible that they may not always be picked up by monitoring. Therefore, complaints are a direct indication that odours may be causing pollution, and should be correctly recognized and responded to. The following actions will be taken on receipt of an external odour complaint or the identification of odour at the installation boundary:

- Any complaints received will be logged in the Facility's documented management systems. The EA will be informed as soon as is reasonably practicable after a complaint has been received.
- The site management will be given the details of the complaint as soon as possible, including the location, nature, time, and date of the complaint.
- If complaints are received, relevant monitoring will be undertaken in the area from which the complaint has been received in order to assess the presence of any odours in this area. Where possible, the likely cause will be identified.
- For all complaints reference will be made to the site activities at the time of the complaints, and further onsite investigations will be conducted to determine whether any abnormal operations are (or were) occurring. The following key potential causes of abnormal emissions will be investigated:
 - Is the waste derived arriving in appropriate vehicles?
 - Are there any unusual characteristics evident in the waste derived fuel arriving or on site (composition, age, condition etc.)?
 - Are facility operations in 'normal operation'?
 - Are the extraction and ventilation systems (through main the stack and odour abatement systems) functioning properly?
 - Are there any 'unusual' activities being undertaken at the Facility?
- If investigations identify that the source of the odour is from an off-site source, feedback will be reported to the complainant, and a complaint will be logged with the off-site source of the emissions.
- If the cause of the odour is established to be on-site, appropriate actions will be immediately implemented (refer to Section 6), and actions devised to prevent reoccurrence.
- Feedback will be given to all complainants on the findings of any investigations if they are known, and a summary will be provided of any remedial measures taken to rectify the odour or taint issues and ensure that the problem has been suitably resolved. The complainant will be asked if the perceived problem is still occurring to measure any improvement achieved.
- PCEL would propose to submit a short factual report to the Environment Agency detailing:
 - the complaint(s) received;
 - the investigations conducted;
 - the findings of those investigations;
 - whether the complaint was substantiated;
 - any remedial measures implemented; and
 - any ongoing improvement actions to be implemented.
- Records of all complaints, subsequent investigations, and remedial actions will be retained on site for a minimum of five years. The site management will ensure that records are readily

retrievable and maintained as fit for retention. As applicable, records will be stored in accordance with data protection legislation.

7.1.1 Action plans

In the event that an odour complaint is proven to be justified and attributable to operations undertaken at the Facility, or a 'non-conformance' occurs with the same effect, a defined Action Plan will be implemented.

The following potential 'non-conformances' have been identified:

- abnormal odour emissions occur;
- significant odour emissions are detected onsite that is believed to pose a risk of impacts off-site; and
- significant site odour emissions are detected during off-site monitoring.

In the event that any of the above occurs, the following actions will be taken:

- If not previously undertaken, a walk-around of the entire site and a review of the activities undertaken at the Facility will be conducted in order to identify the likely cause(s).
- Upon identification of the likely source(s), appropriate corrective and preventative measures will be identified and implemented, depending on the outcome of the investigations. The measures will consider, but not be limited to the following:
 - Suspension of the receipt of wastes suspected of being unacceptably odorous.
 - Review of the mechanical ventilation systems and control of negative pressure in the fuel reception and storage building.
 - Review of the operation of the odour abatement system, if the extraction fan is not operating.
 - Review of the effectiveness of waste acceptance procedures.
 - Review of the waste handling system to confirm that rotation of waste within the fuel reception and storage building is in operation.

Details of any odour 'non-conformances' including the nature of the incident, results of investigations, action taken and any required amendments to the OMP will be made available to the Environment Agency on request.

8 Document Review

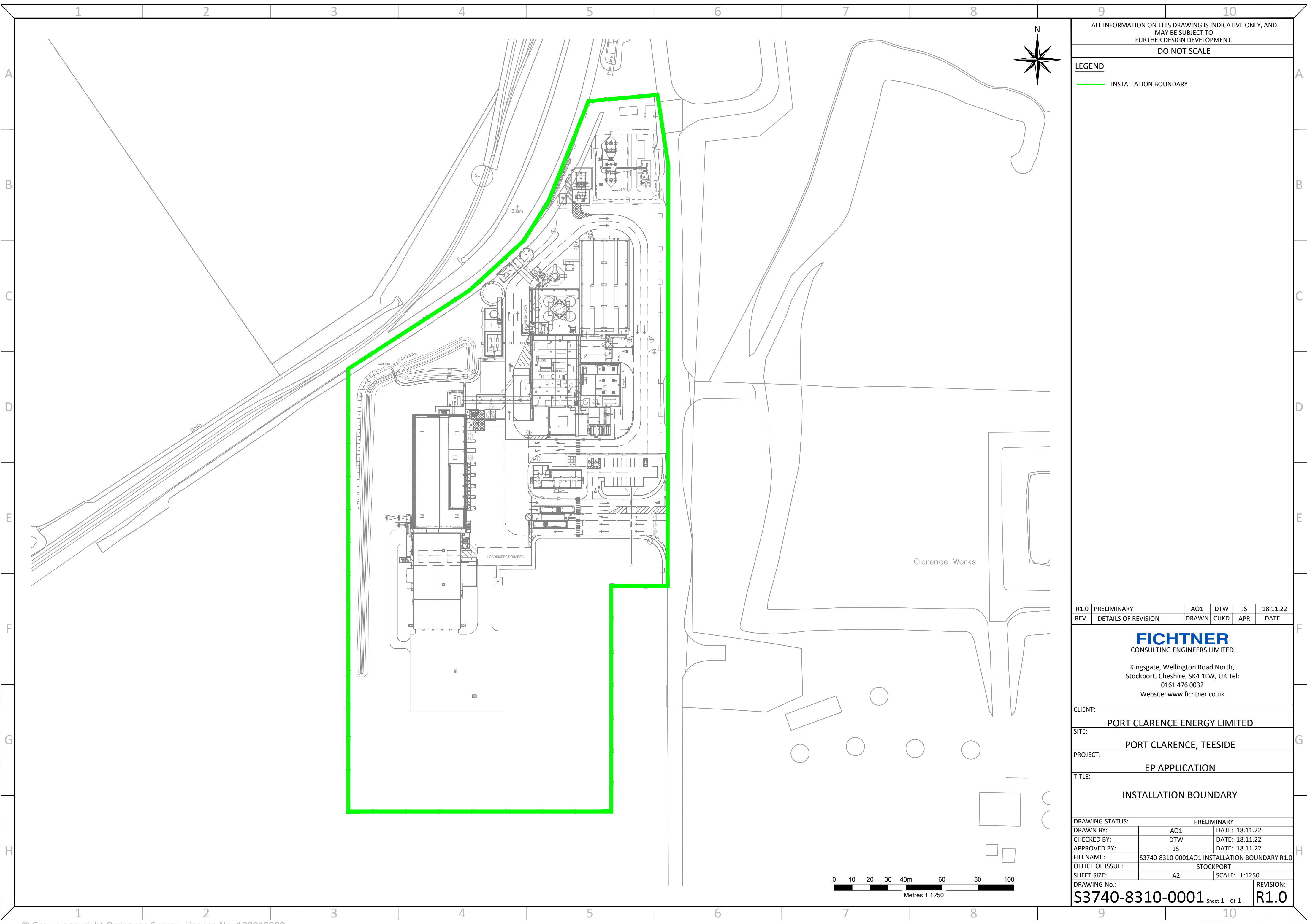
8.1 Review requirement and timescale

This OMP will be formally reviewed by PCEL initially six months after the commencement of operations, and subsequently every twelve months to ensure that the controls described are effective and reflect best available techniques. In addition, the OMP will be reviewed following any relevant changes in site operations or procedures that are likely to have implications from an odour, generation/impact perspective.

Any required changes to the conditions set out within this document will be formally agreed with the EA prior to their implementation.

Appendices

A Installation Boundary



ALL INFORMATION ON THIS DRAWING IS INDICATIVE ONLY, AND
MAY BE SUBJECT TO
FURTHER DESIGN DEVELOPMENT.

DO NOT SCALE

LEGEND

INSTALLATION BOUNDARY

R1.0	PRELIMINARY	AO1	DTW	JS	18.11.22
REV.	DETAILS OF REVISION	DRAWN	CHKD	APR	DATE

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CLIENT:

PORT CLARENCE ENERGY LIMITED

SITE:

PORT CLARENCE, TEESIDE

PROJECT:

EP APPLICATION

TITLE:

INSTALLATION BOUNDARY

DRAWING STATUS:		PRELIMINARY	
DRAWN BY:	AO1	DATE:	18.11.22
CHECKED BY:	DTW	DATE:	18.11.22
APPROVED BY:	JS	DATE:	18.11.22
FILENAME:	S3740-8310-0001AO1 INSTALLATION BOUNDARY R1.0		
OFFICE OF ISSUE:	STOCKPORT		
SHEET SIZE:	A2	SCALE:	1:1250

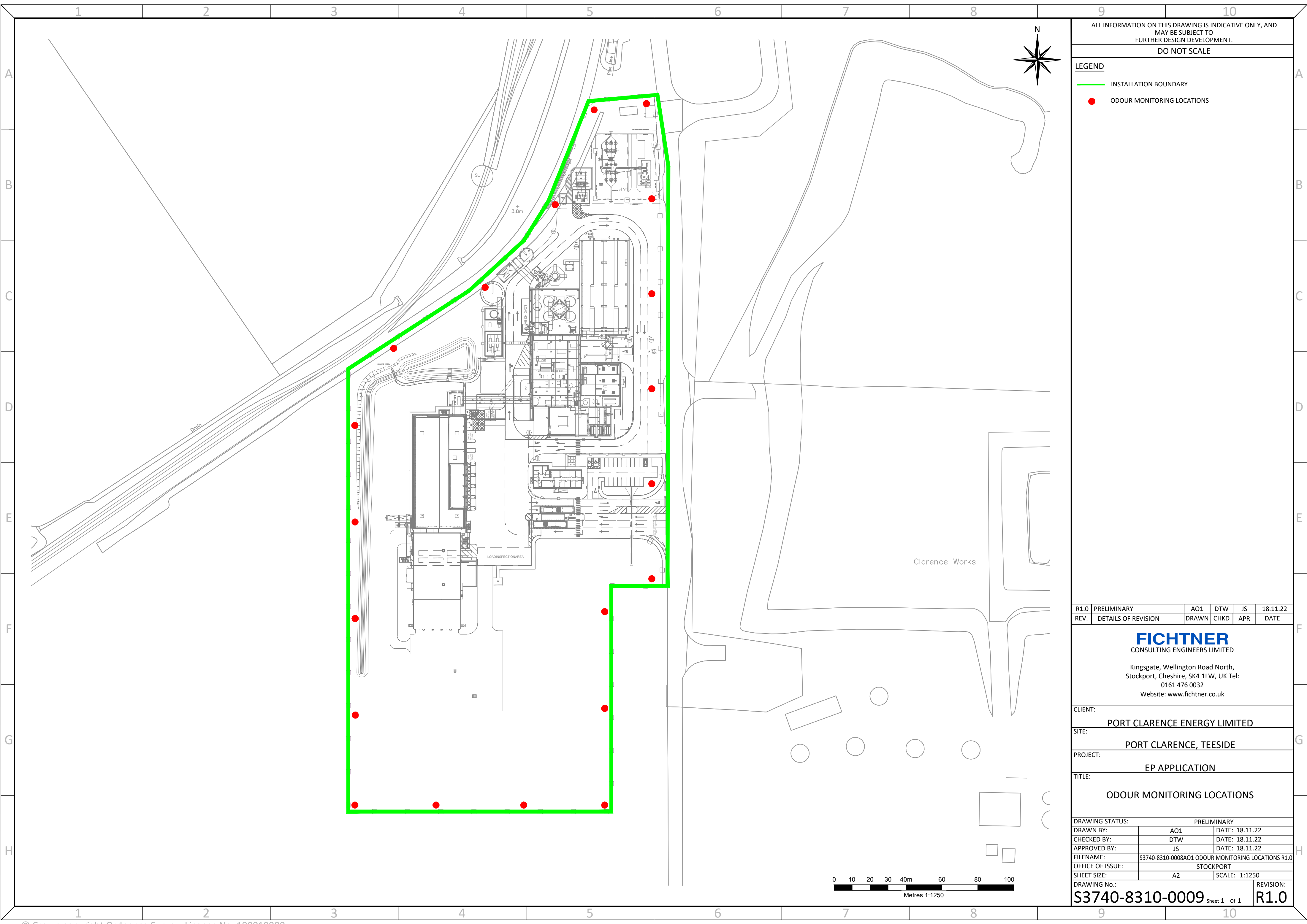
DRAWING No.: **S3740-8310-0001** Sheet 1 of 1 REVISION: **R1.0**

B Sensitive Receptors

Ref	Receptor	Type	Sensitivity	Approximate Distance/ Direction from Installation Boundary (m)	Comments
R1	Saltview Terrace	Residential	High	805	Residential receptor in location towards which winds do not frequently blow and at a distance at which odours from the Facility would not be expected to be identified.
R2	Queen's Terrace	Residential	High	1,130	Residential receptor in location towards which winds do not frequently blow and at a distance at which odours from the Facility would not be expected to be identified.
R3	Middlesbrough college	School	High	950	Receptor downwind of the secondary peak in peak in wind directions at a distance at which odours from the Facility would not be expected to be identified.
R4	Lower East Street	Residential	High	1,194	Residential receptor downwind of the secondary peak in peak in wind directions at a distance at which odours from the Facility would not be expected to be identified.
R5	High Clarence Primary School	School	High	1,412	Receptor in location towards which winds do not frequently blow and at a distance at which odours from the Facility would not be expected to be identified.
R6	Elizabeth House Care Home	Residential	High	1,679	Residential receptor downwind of the secondary peak in peak in

Ref	Receptor	Type	Sensitivity	Approximate Distance/ Direction from Installation Boundary (m)	Comments
					wind directions at a distance at which odours from the Facility would not be expected to be identified.
R7	King George's Terrace	Residential	High	1,638	Residential receptor in location towards which winds do not frequently blow and at a distance at which odours from the Facility would not be expected to be identified.

C Monitoring Locations



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FURTHER DESIGN DEVELOPMENT.

DO NOT SCALE

- LEGEND
- INSTALLATION BOUNDARY
 - ODOUR MONITORING LOCATIONS

R1.0	PRELIMINARY	AO1	DTW	JS	18.11.22
REV.	DETAILS OF REVISION	DRAWN	CHKD	APR	DATE

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CLIENT: PORT CLARENCE ENERGY LIMITED

SITE: PORT CLARENCE, TEESIDE

PROJECT: EP APPLICATION

TITLE: ODOUR MONITORING LOCATIONS

DRAWING STATUS: PRELIMINARY		
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D Odour Assessment Report

Installation		Date	
Weather		Wind (strength / direction)	
Temperature (°C)		Pressure (mbar if known)	
Ground Conditions		Cloud Cover	
General Air Quality		Time: Start	
		Time: Finish	
Activity on Site			

Plan attached showing location & extent of odour

YES / NO

Complaint Received?

YES / NO

If **YES** complete the following:

Date & time complaint received		Number of complaints which may relate to the same source	
Location of complaint			
Grid Reference (if not a property)		Time odour noticed and duration	

Additional Comments:

Action Required:

Signed:

Date:

Test Location & Time	Intensity (1 – 5)	Offensiveness (1 – 4)	“Dilution to Threshold” Ratio	Comments (including persistence, transience, potential source)

Note: The “Dilution to Threshold” Ratio is obtained from the testing individual and is only required if an odour is detectable, i.e. a 2 or higher for Intensity.

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