



Preston New Road Exploration Site Construction Method Statement

Appeal# APP/Q2371/W/15/3134386 Lancashire Application# LCC/2014/0096

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Construction Method Statement				
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1.0 Scope and Purpose of Construction Method Statement (“CMS”)

The purpose of the CMS is to describe the method of site construction work for Cuadrilla Bowland Ltd (Cuadrilla) Preston New Road exploration site development. The CMS identifies a number of planning conditions applicable to the phase of operation and how they will be complied with on site. Supplementary management plans support the CMS and will be referenced for further information. These include the following plans

- Arup: Traffic Management Plan;
- Arup: Biodiversity Mitigation Strategy;
- Arup: Landscape Management Plan;
- Arup: Noise Management Plan;
- Construction Method Statement; and
- Cuadrilla’s Complaint Procedure

This CMS has primarily been prepared in accordance with the requirements of condition 12 of the planning permission issued by the Secretary of State on 6th October 2016. This states:

“No development hereby approved shall commence until a Construction Method Statement for the construction phase of the access and the site has been submitted to, and approved in writing, by the County Planning Authority. The Statement shall provide for:

- a. The location of parking of all vehicles of site operatives and visitors (on site);*
- b. The erection and maintenance of security and noise fencing;*
- c. A scheme for recycling/disposing of waste resulting from construction work (there shall be no burning on site);*

The approved Construction Method Statement shall be adhered to throughout the construction phase of the site.”

The CMS has also been prepared to address the requirements of the following conditions. Table 1 below provides a reference to planning conditions and where the relevant information can be found within the CMS.

Table 1: CMS and Planning Conditions Index

Planning Condition	Section of CMS
Condition 4 The development shall be carried out, except where modified by the conditions to this permission, in accordance with the approved plans received by the Director of Planning and Environment on 2 June 2014: <ul style="list-style-type: none"> • PNR-EW-001 Location Plan • PNR-EW-002 Location Plan: Surface works • PNR-EW-003 Parameter Plan • PNR-EW-004 Parameter Plan: Sections 	Appendix A



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Planning Condition	Section of CMS
<p><i>Condition 8</i></p> <p>No part of the development hereby approved shall commence until a scheme for the construction of the site access works to Preston New Road and internal site access road (which shall provide details of the construction of the access points to the main site access and to the occasional access for National Grid and shall include details of width of access, surfacing, kerb radii, visibility splays retaining as much of the existing hedgerows as possible, fencing, gates, soil stripping, storage and drainage) have been submitted to, and approved in writing by the County Planning Authority. The site access works shall be completed in accordance with the approved scheme, details and plans prior to the commencement of the development of the site access road and exploratory works compound.</p>	<p>Section 3.0</p>
<p>Condition 10</p> <p>No part of the development hereby approved shall commence until details of the location (and which shall be within the planning application boundary), design and specification of wheel-cleaning facilities or other measures to prevent the tracking out of material or debris onto the public highway have been submitted to, and approved in writing by the County Planning Authority. The wheel cleaning facilities or other measures approved pursuant to this condition shall be installed and thereafter maintained in working order and be used by all Heavy Goods Vehicles leaving the site throughout the construction and restoration phases of the site to ensure that no debris from the site is deposited by vehicle wheels upon the public highway. Throughout the operational life of the site, the access road shall be maintained in a way to prevent the tracking out of material or debris onto the public highway.</p>	<p>Section 4.4</p>
<p>Condition 12</p> <p>No development hereby approved shall commence until a Construction Method Statement for the construction phase of the access and the site has been submitted to, and approved in writing, by the County Planning Authority. The Statement shall provide for:</p> <ol style="list-style-type: none"> a. The location of parking of all vehicles of site operatives and visitors (on site); b. The erection and maintenance of security and noise fencing; c. A scheme for recycling/disposing of waste resulting from construction work (there shall be no burning on site); <p>The approved Construction Method Statement shall be adhered to throughout the construction phase of the site.</p>	<p>Section 3 & 4.5</p>
<p>Condition 15</p> <p>All available topsoil and subsoil shall be stripped from any part of the access road, site compound and interconnections to the national gas and water grids before that part is excavated or is traversed by heavy vehicles, or before plant or machinery, or roads, buildings, plant yards or stores are constructed on it. All stripped topsoil and subsoil shall be stored in separate mounds within the areas identified on plan no PNR-EW-001 for their use in the restoration of the site.</p> <p>Condition 16</p>	<p>Section 3 Appendix B</p>



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Planning Condition	Section of CMS
<p>No topsoil's or subsoils shall be exported from the site.</p> <p>Condition 17</p> <p>All topsoil and subsoil mounds shall be graded and seeded within one month of their construction and thereafter retained in a grassed, weed free condition throughout the duration of the development pending their use in the restoration of the site.</p>	
<p>Condition 19</p> <p>Site construction and restoration including:</p> <ul style="list-style-type: none"> • Delivery or removal of materials, • Construction of the site access and compound • Installation of the interconnections to the national gas and water grids • Works associated with the delivery and removal of plant and equipment associated with all drilling and extended flow testing of gas monitoring works during the exploration and appraisal phases of the site <p>Permitted Hours of work: 07.30 to 18.30 hours Mondays to Fridays (except Public Holidays) 08.30 to 12.00 hours on Saturdays (except Public Holidays) Not permitted Sundays or Public Holidays.</p>	Section 3.0
<p>Condition 23</p> <p>All foul drainage shall be discharged to a sealed watertight tank fitted with a level warning device to indicate when the tank needs emptying. Upon emptying the contents of the tank shall be removed from the site completely.</p>	Section 3.0
<p>Condition 24</p> <p>Buffer zones with a width of not less than 1m shall be maintained between the perimeter mounds or edge of the drilling compound and the site perimeter ditches within which there shall be no vehicle movements, storage of materials, excavation, or other construction activity.</p>	Section 3.0
<p>Condition 32A</p> <p>Prior to the commencement of development, a detailed dust management plan for the access and site construction, interconnections to the national gas and water grids and restoration of the site and access phases of the site shall be submitted to the County Planning Authority for approval in writing. The dust management plan shall include details of the equipment to be used, location of such equipment, details of how dust is to be monitored and the results to be made available to the County Planning Authority. Monitoring shall be carried out and the results of such shall be submitted in writing to the County Planning Authority in accordance with the approved management plan.</p>	Section 4.1



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Planning Condition	Section of CMS
<p>The approved dust management plan shall be adhered to throughout the development of the access and site construction interconnections to the national gas and water grids and restoration of the site and access phases of the site and restoration phases of the site.</p>	
<p>Condition 33</p> <p>Prior to the commencement of each phase specified in condition 3, a scheme for the lighting/floodlighting of the site must be submitted to the County Planning Authority and approved in writing for that phase. The scheme for each phase shall include details of:</p> <ol style="list-style-type: none"> a) Type and intensity of lights; b) Types of masking or baffle at head; c) Type, height and colour of lighting columns; d) Location, number and size of lighting units per column; e) Light spread diagrams showing lux levels at the site boundary and calculation of the impact of these on nearby residential properties; f) The maximum hours of employment of the proposed lighting relative to the proposed nature of the operations. <p>Thereafter the lighting/floodlighting shall be erected and operated in accordance with the approved scheme throughout the operational life of the relevant phase.</p>	Section 3.0
<p>Condition 34</p> <p>No development shall commence until details of the colours of the external cladding or finish of the acoustic fencing, sand silos, flare stacks and drilling rig have been submitted to and approved in writing by the County Planning Authority. The details shall provide for the colour finish to be a single or combination of browns, greens and greys.</p> <p>The fencing, sand silos, flare stacks and drilling rig shall be painted in the approved colours prior to or within 2 weeks of their arrival on site and thereafter maintained in the same colour(s) throughout their presence on the site with the exception of plant and equipment required for short durations associated with well operation activities.</p> <p>Condition 34A</p> <p>No corporate logos of any nature shall be displayed on any of the plant and equipment that would be visible above the height of the acoustic fencing or on the acoustic fencing, security fencing or access gates to the site.</p>	Section 3.0
<p>Condition 36</p> <p>Prior to the commencement of development, a scheme identifying the height, location and appearance of any security fencing which may be required to be installed on the site shall be approved by the County Planning Authority. It shall not include fencing of more than 4.5m in height. Only security fencing in the approved scheme shall be erected on the site. Any security fencing installed shall be removed upon the conclusion of site decommissioning.</p>	Section 3.0 Appendix C
<p>Condition 43</p> <p>No development shall commence until a scheme for archaeological work in accordance with</p>	Section 4.2



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Planning Condition	Section of CMS
a written scheme of investigation has been submitted to and approved in writing by the County Planning Authority. The archaeological work contained in the approved scheme shall be undertaken during all soil stripping exercises.	

The following appendices are referred to within the CMS:

Appendix A: Site Drawings

- PNR-EW-001 Location Plan
- PNR-EW-002 Location Plan: Surface works
- PNR-EW-003 Parameter Plan
- PNR-EW-004 Parameter Plan: Sections

- PNR-ARP-CH-011 Access Junction General Arrangement, Tracking and Visibility
- PNR-ARP-CH-013 Access Junction Landscaping and Pavement Construction
- PNR-ARP-CH-015 Access Road Cross Sections and Long Section
- PNR-ARP-CH-018 Compound Construction Landscaping
- PNR-ARP-CH-019 Compound Construction Earthworks
- PNR-ARP-CH-023 Surface Water Drainage

Appendix B: Arup Soil Handling For Clients & Contractors

Appendix C: Security & Acoustic Fence Drawing

- PNR-ARP-CH-020 Compound and Access Road Details

Appendix D: National Grid Entrance

Appendix E: Dust Monitoring Locations

2.0 Induction & Pre-start Planning

Before the construction works begin the construction contractors operational team will attend a HSE contractor on-boarding session organised by Cuadrilla as part of the site induction.

Once the contractor has been on-boarded construction operations can begin. During the pre-start planning stage the Site Manager will liaise with the statutory undertakers and undertake a desk study to identify all known underground and overhead services. Prior to any excavation works being undertaken the Site Manager will arrange for Ground Penetrating Radar (GPR) Surveys and CAT scan surveys to be carried out by trained operatives to locate buried services.

Trial trenches and trial holes will be excavated by hand dig, in accordance with HSE Publication HSG47 "Avoiding danger from underground services", prior to any mechanical excavation to locate and positively identify known buried services. This procedure will also locate and positively identify any services not indicated during the desk study but subsequently located during the GPR Surveys and Cable Avoidance Tool ("CAT") scans.

Buried services identified will be recorded on "As Built" record drawings.



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3.0 Construction Management

All construction and restoration operations will be carried out in only within with the following times:

Monday to Friday 07:30 to 18:30 hours and Saturday 08:30 to 12:00 hours. No work shall place on Sundays or public holidays.

The construction works will be undertaken as outlined in the CMS and in accordance with the approved plans referred to in condition 4:

- PNR-EW-001 Location Plan
- PNR-EW-002 Location Plan: Surface works
- PNR-EW-003 Parameter Plan
- PNR-EW-004 Parameter Plan: Sections

3.1 Site Accommodation

The following site offices and welfare cabins will be provided throughout the duration of the construction works comprising the following facilities:

- Rest facilities for up to seven staff and operatives
- Table and chairs
- Hot and cold water provision
- Microwave oven and kettle
- 240v electric points
- Fully flushing WC in private toilet area
- Washing, changing and drying facilities
- Storage area
- Generator
- Fuel, Water and Waste storage

Welfare facilities will be sealed with a watertight tank with level warning device. All foul drainage will be vacuum sucked and taken off site for disposal to a permitted waste treatment facility by an authorised waste carrier.

3.2 Access off A583

Access to the proposed location of the well pad is off the public highway Preston New Road, Little Plumpton. Provision will be made within the site boundaries to avoid the need for delivery vehicles to be stacked/parked on Preston New Road or any of the surrounding roads.

The access road will be 8.0m wide at the entrance reducing to 4.0m after approximately 50m from the tie-in with Preston New road as detailed on plan PNR-ARP-CH-011. This will enable two way traffic flow at the site entrance. Once past the 50m tie with Preston New road the access track tapers down to a single lane. Approaching the well pad the site access reopens to a 8m wide road to accommodate two way traffic movement. Once the existing services have been located and protected where applicable then the existing kerbs and verge will be removed to



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allow the access point to be constructed. The access will be created by importing, placing and compacting layers of 6F5 to the design levels as indicated on the plan PNR-ARP-CH-011. Placing and compaction will be undertaken fully in accordance with Series 600 of The Specification for Highway Works ("SHW"). Due to the variability of the quality of 6F5 and the permissible constituents as defined by the SHW no demolition material or recycled aggregates will be used and that all 6F5 material will be crushed quarried aggregate. The access road will utilise natural percolation into the ground to drain surface water.

Kerbs will be laid to the new access junction alignment using mechanical lifting equipment to reduce the impact of manual handling injuries.

Following installation of the kerbs MOT Type 1 subbase will be imported, placed and compacted to the detail as shown on drawing PNR-ARP-CH-013. Compaction will be with an appropriately sized vibrating twin drum roller, typically a Bomag 120 or similar, operated by a competent operative with the appropriate CPCS qualification. The base course and binder course will be machine laid by a specialist surfacing contractor to levels determined from the newly installed kerb lines. The surface course will not be laid until all construction works have been completed to avoid damage to the permanent works.

The initial enabling works activities will be undertaken with welfare provided via a mobile welfare van until such stage that the works compound has been established and secured. The welfare van will have a sealed watertight tank with level warning device.

A temporary compound for welfare and car parking will be established. All vehicles will be situated on an impermeable membrane to protect the soil. The location of the temporary parking will be located adjacent to the construction area. No vehicles will be parked on the A583 or verges unless required for temporary construction activity purposes e.g. unloading materials or equipment.

Existing hedgerow and trees will be removed by a specialist landscape contractor. Removal of tress and hedges will be conducted fully in accordance with the Biodiversity Mitigation Strategy and Landscape Management Plan to provide visibility splays for safe access and egress of the site.

Following completion of the temporary site compound, site access junction and wheel washing facilities the works will commence on the main access road. Topsoil will be stripped using tracked excavators with topsoil formed into bunds and treated as described above. The topsoil strip will be undertaken prior to any construction traffic being permitted on the area in accordance with Landscaping, Biodiversity and Archaeological requirements. The access road will be excavated to formation with spoil loaded into dumpers for deposition in temporary stockpiles adjacent to the side of access road for re-use. The access road will be constructed in accordance with drawing PNR-ARP-CH-015 with imported MOT Type 1 subbase placed and compacted in layers.

For occasional visit by National Grid they would utilise the entrance outlined in Appendix D. The entrance uses an existing gated entrance and kerb radii along the A583. The access track would comprise of a gravel track from the gated entrance to the national grid compound. Soil stripped for the excavation of the access track will be stored on site surrounding the national grid compound with natural percolation for drainage.



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3.3 Security Fencing

Once the access road has been constructed up to the perimeter of the proposed well pad location a temporarily fenced off area using 2.0m high, anti-climb, Heras type fencing or equivalent which will be double clipped and braced in accordance with the manufacturer's recommendations. Twenty four hour manned security will be provided.

A specialist fencing contractor will attend site to begin erection of the main security fence.

The proposed fencing will be as detailed on drawing PNR-ARP-CH-020 and is to be 4 metres in overall height. A 1.2 metre high post and wire fence (stock proof fence) will also be installed around the well pad.

The security fencing will be made up of a 2.4 metre high standard prison mesh fence at the bottom with the top 1.6 metres made up of a "Powerfence" system. The system will be zoned to allow for activation at the upper and lower fence levels independently and also to allow the system to be de-energised by area and zone for servicing or repairs. The fence will secure the entire perimeter of the site but not the access track.

The security fence will be subject to ongoing regular inspections to ensure the fence remains in good condition. Any defects identified shall be reported to the Site Manager and subsequently raised with the installer to repair the defect.

The security fence will not display any corporate logos. The appearance of the security fence is shown in figure 1.

Figure 1: Indicative photos of the security fence.



3.4 Main Earthworks

On completion of the temporary site compound the main earthworks operations will be undertaken. The topsoil will be stripped and stored for re-use in covered subsoil mounds as per

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PNR-EW-001. Where topsoil storage is anticipated to be in excess of one month then the bunds will be treated with herbicide and grass seeded by a specialist landscape contractor as required. All material will be appropriately banded in a suitable part of the site as indicated on drawings PNR-ARP-CH-018 to 020 and in accordance with the ARUP "Soil Handling Guidance for Clients and Contractors". Topsoil will be stripped from the initial section of the access junction and access road as well as from the proposed construction compound area using a tracked excavator. All topsoil will remain on site within the site boundaries. The topsoil will be stored in shaped bunds approximately 4.0m high.

Concurrently to the topsoil strip a geotextile, e.g. Terram 1000, will be laid before placing a 200mm layer of MOT Type 1 subbase to form temporary hard standing for welfare and car parking. Sufficient parking spaces will be provided for the anticipated numbers of staff, operatives and visitors; approximately 15 vehicles. Segregated pedestrian walkways will be provided within the temporary site compound using proprietary pedestrian barriers to separate vehicles and pedestrians. A temporary site welfare and accommodation compound for welfare and car parking shall be established. All vehicles will be parked on the temporary stoned geotextile area. The location of the parking area will be situated adjacent to the main site works. No vehicles will be parked on the A583 or verges.

Once the topsoil strip is completed the cut/fill operation will be undertaken using trained and competent operatives. Line and level for all earthworks will be controlled by a site engineer using a combination of traditional profiles and batter rails together with laser levels and GPS assisted location. The subsoil will be excavated and placed into areas of fill or perimeter bunds as detailed on drawings PNR-ARP-CH-018 to 020. Subsoil previously excavated and stored during construction of the access road will be re-excavated and used in construction of the fill areas and perimeter bunds as necessary.

Working concurrently with the earthworks operations will be the installation of the drainage system, including headwalls, manholes and valves which will be undertaken by experienced groundworks operatives. Drainage will be installed in accordance with drawing PNR-ARP-CH-023.

Following the completion of the earthworks and hardstanding the groundworks operatives will undertake the construction of the concrete works to the well pad and drilling cellar.

The areas will be excavated and trimmed to formation with the membrane and blinding concrete placed immediately. The membrane will be lapped and joined with the membrane below the hardstanding in accordance with the manufacturer's recommendations. Competent steel fixers will fix the required rebar/mesh with competent joiners fixing the formwork. Bases and kickers will be formed and poured initially with the walls following on immediately after stripping the base/kicker formwork.

All earthworks materials and compaction will comply with series 600 of the Specification for Highway Works. Material will be in accordance with Specification for Highways Works Table 6/1 and compaction will be undertaken using appropriate plant in accordance with Table 6/4.

Geogrid layers, membranes will be placed and MOT Type 1 subbase will be imported, placed and compacted on the prepared earthworks formation to form the finished hardstanding area. Type 1 subbase will be in accordance with clause 803 of the Specification for Highway Works and will be compacted using appropriate plant in accordance with Table 8/4 of the Highway Specification.



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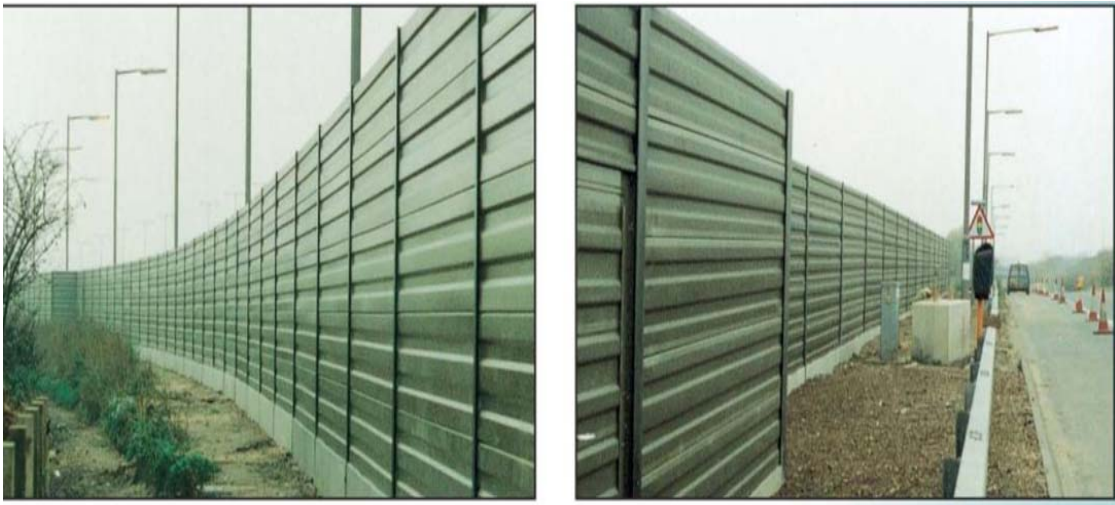
The works area will include a 1.0m buffer zone around the perimeter of the site. No storage of plant or materials will be permitted within the buffer zone. The buffer will be demarcated using Netlon type fencing (or similar) mounted on steel fence pins. Post installation of the membrane, fence pins would be prohibited. Either chapter 8 barriers or equivalent barrier system would be used or a demarcation line identified on the pad stone.

3.5 Sound Barrier Wall

The installation of the sound barrier wall could be constructed either before, concurrently or on completion of the earthworks and hardstanding. The sound barrier wall will be 4 metres high with razor wire attached to the outside facing top of the fence as detailed on drawing PNR-ARP-CH-020. The colour of the sound barrier wall will be painted in accordance with the Landscape Management Plan without any corporate logos.

The acoustic fence will be subject to ongoing regular inspections to ensure the fence remains in good condition. Any defects identified shall be reported to the Site Manager and subsequently raised with the installer to repair the defect. The appearance of the sound barrier wall is shown below in figure 2.

Figure 2 Indicative Appearance of Sound Barrier Wall



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4.0 Environmental Management Controls

This section of the CMS provides environmental control measures to be employed during the construction phase of the development and to satisfy planning conditions.

4.1 Dust Management

The management of dust will be carried out in accordance with IAQM guidance.

The dust management plan shall apply to all stages as outlined in condition 32A; site construction, interconnections to the national gas and water grids and restoration of the site and access phases.

As per planning condition the table below identifies equipment to be used during the construction and restoration of the site (including national grid and water mains connection). Due to the mobility of the plant and equipment the location will vary depending on the tasks being carried out by the plant.

Table 2: List of construction equipment

Access Road & Site Pad/ National Grid Connection & Waste Mains Connection
Tracked Excavator (71t)
Dump Truck
Dumper
Tracked Excavator (22t)
Dozer
Vibratory Roller
Wheel Wash
Wheeled Mobile Crane
Lorry
Diesel Generators
Hiab
Small tools
Welfare Unit

Source: Arup May 2014, Environment Statement

The following dust mitigation measures will be adopted at the site:

- Review existing baseline dust data;
- Workforce education regarding dust impacts and mitigation measures;
- Display contact information as per complaints procedure for the community to raise dust complaints;
- Undertake daily onsite and offsite inspections, where receptors including roads are present, to monitor dust, record inspections results, and make inspection records available to local county planning authority;
- Plan site layout so machinery and dust generating activities are located away from receptors as far as possible;
- Inspect and log sources of dust and potential receptors during construction phase;

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- Set appropriate speed limits (10mph) for site vehicles to minimise dust generation;
- Keep surfaces swept and damp down with water at regular intervals during dry weather;
- Minimise drop heights into haulage vehicles and dumpers;
- Ensure cutting and grinding operations are adequately shielded or wetted;
- Sheet over lorries carrying dry materials to or from site;
- Use the dry wheel wash, for appropriate vehicles;
- Store fine dry materials in containers or provide adequate protection from the wind;
- Position stockpiles away from residential areas or watercourses;
- Clean up or damp down any spillage of dry dusty materials;
- Erect screens or sheeting around dusty activities;
- Regularly remove waste material from site;
- Notify a line manager if work activities are causing poor air quality;
- Burning materials on site is prohibited;
- Avoid using poorly maintained plant;
- Avoid dry sweeping of large areas;
- Turn plant and vehicles off when not in use; and
- Follow up complaints in accordance with the procedure.

A 12 month baseline of dust monitoring has been collected surrounding the site. The baseline will provide a reference point to identify elevations during the site construction activity.

Dust monitoring points will be established on all sides of the works area which includes the main site build and water grid connection. See Appendix E for details.

Depositional Gauges (“DGs”) will be deployed around the site as part of a multifunctional dust monitoring stations previously used at Preston New Road (PNR) to record the air quality baseline. These multifunctional monitoring stations facilitate the direct measurement of several parameters at one fixed location. Deposition (dust fall) rate at a particular location is measured by placing a Frisbee dust gauge in the horizontal plane to collect dust particles as they are deposited out of the air and onto the surface of the Frisbee gauge. The inverted Frisbee gauge is mounted horizontally on a pole approximately 1.75m-2.5m above the ground.

Directional depositional records the quantity of particles travelling past a particular location in a given time is termed dust flux. This will be measured by placing a sampling device in the vertical plane to capture the dust as it passes by in a particular direction.

The dust flux is expressed in units of mass per unit area in the vertical plane per unit time, e.g. milligrams per square metre per day ($\text{mg m}^{-2} \text{day}^{-1}$), although metrics other than mass (e.g. staining effect) can also be measured.

Directional adhesive dust flux gauges take the form of an adhesive strip system which measures the soiling of a white adhesive surface over a known period and gives a measurement of the deposition (as percentage Effective Area Coverage (%EAC) per day) using a reflectometer.

PM_{10} & $\text{PM}_{2.5}$ i.e. particulates with a diameter of 10 microns or less and particulates with a diameter of 2.5 microns or less are measured utilising the DG station but they operate via the use of a gravimetric pump.



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The pump effectively draws in air through a filter head containing filter paper of a known weight (this varies per filter with each individual weight recorded) for a known period of time (usually 24hrs) at a known rate (10 l.min⁻¹). The filter paper is then re-weighed with the weight difference providing the ambient air concentration (following calculation).

The below summary table provides directional and depositional dust sampling methodology and analysis.

Table 3: Dust Monitoring Methodology

Measured Parameter	Sampling Method	Sampling Period	Analysis Method	Detection Limit
Depositional Dust	Combined Frisbee Dust Deposition & Adhesive Strip Directional Gauge	1 Month	Gravimetric & reflectance FD01	1mg
PM ₁₀ Dust	Pumped Gravimetric sample	24 hours	Gravimetric	5ug
PM _{2.5}			MORD2	

In the unlikely event of a complaint resulting from dust emissions, the complaint will be managed in accordance with Cuadrilla's Complaints Procedure.

For the installation of the national grid connection the location of the works is to be constructed at a distance which would render the existing dust monitoring points ineffective. A further dust monitoring station will be deployed 2 months before installation works commence and will be maintained during the construction works of the national grid connection. The location of the monitoring station will be located to the west of the national grid connection compound between the site works and the nearest receptor. The dust mitigation measures outlined previously in bullet points, where appropriate, shall be utilised to control dust during the national grid compound construction.

The results of the dust monitoring will be made available to County Planning Authority on a monthly basis. The report will identify the previous month's dust data benchmarked against baseline data.

4.2 Archaeological Investigations

A trained and competent archaeologist will be present on site with a watching brief during all soil stripping operations.

Excavation will be undertaken utilising a (typically) 30T excavator fitted with a range of buckets, including a wide toothless bucket. A 9T dumper will be used for the management of arising. One archaeologist will be deployed to supervise each mechanical excavator engaged with ground reduction; no intrusive machine work will be carried out in the absence of an archaeologist.

Operating under the supervision of a competent archaeologist, the excavation gang will lift and strip

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surfaces and overburden deposits in a systematic, logical manner and in line with Appendix B "Soil Handling Guidance". As far as is reasonable and practical, the machine will use long, shallow sweeps of the bucket to remove materials in successive level spits of a depth of approximately 200mm or less across as wide an area as possible. The supervising archaeologist will ensure that, where practicable, the excavator does not rut, compact or otherwise damage buried or exposed archaeological features and deposits by crossing previously stripped areas or by digging too deep across a limited area. All machine stripping will be carried out at a speed which will leave a good standard of finished surface, i.e. a smooth, even and clean surface, with a minimum of smearing, polishing and rutting. If in the unlikely event of remains being encountered the archaeologist has the authority to stop machinery operating and investigate the remains.

All arising will be appropriately bunded in a suitable part of the site as indicated on drawings PNR-ARP-CH-018 to 020. Bunds will be sealed at a safe height and angle of repose.

Supervised stripping will proceed in successive spits until whichever of the following is encountered first:

- the uppermost horizon of significant archaeological remains;
- the base of the compound construction level;
- the base of any service or drainage runs and pit excavations; or
- the upper surface of the natural geology.

Once groundworks reach the natural geology no further archaeological works within that area will be required and groundworks in that area will resume unmonitored. At this stage bulk earthworks operations will be undertaken to excavate to formation level and place geotextiles and fill materials.

The stripped areas, including the edges if necessary, will be inspected for archaeological remains and, if required, they will be cleaned sufficiently to enhance the definition of features. Mechanically excavated spoil will be monitored in order to recover artefacts that will assist in meeting the aims of the project, before being removed to a designated storage area.

During supervision of the mechanical excavation, should archaeological remains be identified, the archaeologist will stop the machine so that they can examine what has been revealed. In the very rare event that the findings are extremely fragile, the archaeologist may cease excavation within that part of the site. The archaeological features or deposits will be demarcated with Netlon fencing or candy tape. The archaeologist will inform the contractor, Cuadrilla, and County Planning Authority of the discovery of the features. Ordinarily, the archaeologist will utilise the machine to strip the soil from around the feature of archaeological interest, gradually expanding this area until the limits of the archaeological find are defined.

At the end of each day the archaeologist will provide a report on the progress of the archaeological works, including information on progress and findings, together with any other salient information.

Following a review of the findings it may be necessary to undertake some form of further archaeological investigation of some of the remains identified within the site footprint in order to mitigate any damage associated with the construction works.

Any sampling will be appropriate and proportional to the importance, quantity, and complexity of the archaeology exposed, as well as its perceived research value. The following sections are typical, provisional, methodologies which can be adopted once Lancashire County Archaeological Service ("LCAS") and Cuadrilla have agreed the full scope of works associated with any sample



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excavation.

Any archaeological investigation will be designed to recover data sufficient to allow for “preservation by record” as a form of mitigation, and establish the extent, date, character and significance of the archaeological remains. The primary aims would be:

- to characterise the overall nature of the archaeological resource and to understand the process of its formation;
- to create a detailed plan of all archaeological features;
- to establish the character of those features in terms of cuts, soil matrices and interfaces;
- to establish in outline a dated sequence of structures and/or deposits and thus to define changes in site organisation over time; and
- to recover, where appropriate, representative ecofactual and palaeoenvironmental samples to provide evidence of function and past land use.

Selected archaeological deposits, features, and/or structures will be excavated to the extent that they are sufficiently characterised and understood, particularly in terms of extent, date and function; this will involve cleaning and excavating a representative range of components.

Cut features identified against the edges of the excavation will not be excavated below a safe working limit unless it is confirmed by LCAS that they are of exceptional importance. Should any particularly deep-cut feature, such as a well pit, be revealed this will be manually excavated to a safe working limit. Thereafter, if LCAS wishes to see the further excavation of any such feature, this could be achieved by reducing the general area of the feature (i.e. a 1m 'cordon') using a machine to allow further safe manual excavation.

All information identified in the course of the site works will be recorded stratigraphically, using a system, adapted from that used by Centre for Archaeology Service of English Heritage, and in accordance with ClfA standards (2008b), with sufficient pictorial record (plans, sections, and photographs) to identify and illustrate individual features. Primary records will be available for inspection at all times.

All finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (“UKIC”) First Aid For Finds, 1998 (new edition) and the recipient museum's guidelines, likely to be the Museum of Lancashire. All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum's archive curator.

Any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

Any human remains uncovered will be left in situ, covered and protected. No further investigation will continue beyond that required to establish the date and character of the burial. Cuadrilla, LCAS, and the local Coroner will be informed immediately. If removal is essential, the exhumation of any funerary remains will require the provision of a Ministry of Justice licence, under section 25 of the Burial Act of 1857. It is likely that the discovery of human remains will necessitate a revision to this project design and to the proposed resources. The removal of human remains will be carried out with due care and sensitivity under the environmental health regulations.



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The recovery of adequate samples of environmental material can provide useful information for an understanding of processes acting upon the site and for placing the site within a wider ecological context. Bulk sediment samples of approximately 40 litres will be collected from any suitable (undisturbed, uncontaminated and of non-modern origin) deposits or features of demonstrable anthropological origin for the recovery of plant and faunal remains.

Reporting will be undertaken in two sub-stages. The first will comprise the compilation of the Watching Brief Findings Report. This will comprise a brief overview of the findings, a summary of the collated archive, a rapid assessment of the analytical potential of the different elements of the archive, and a proposal and programme for any appropriate analysis..

The second stage will involve the complete results of the investigation, including any analysis undertaken, will be presented within a Site Summary Report. All reports will be submitted to the County Planning Authority.

4.3 Lighting

It is proposed to limit the all construction work (well pad and site access) as far as possible to daylight hours, however, should the programme dictate working outside summer months then temporary, localised task lighting along with localised lighting for walkways will be used. The lighting will be low powered and restricted to the task area. No light spill shall be allowed above the horizontal plane. On deployment of the task lighting a visual check will be conducted to ensure that lighting spill is not impacting or in the direction of sensitive receptors. A curfew of 19:00 hours will be set to turn off task based lighting to ensure operational staff can leave the site in a safe manner. ILP Guidance Notes For The Reduction of Obtrusive Light (GN01:2011) recommends a curfew 23:00 hours when not specified.

As outlined within Appendix O of the Environmental Statement, O1.2 (Arup 2014) temporary task lighting specifications are as follows:

- SMC ECO 90 mobile lighting tower
- Mast – Maximum Height (metres): 9010mm, zinc plated consisting of a grey colour mast
- Mast Rotation: 360°
- Lamp Specification: 4 x 400W 230v metal halide
- Lamp Control: 12v 45° movement actuator which is adjustable to ensure the lamp can be directed to the correct position

The location of the task based lighting will move to meet the construction needs. Therefore task lighting will be temporary and of a short duration not requiring fixed columns. As a result the spread of light will be consistent with the findings established within the Environment Statement. The task based lighting will have a source intensity of 5 kilocandelas (kcd) and will not exceed the pre curfew limits of source intensity as defined in ILP GN01.

Table 4 provides further mitigation measures to manage the SMC ECO 90 mobile lighting tower to ensure that the positioning of the lighting does not go above the horizontal plane.

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Table 4 : Examples of typical mitigation measures as recommended by ILP GN01.

Description	Example of Non-Compliance	Example of Good Practice
Luminaires with no upward light spill (i.e. horizontal 'flat glass' lens, compact light source for better light control)		
Luminaires correctly specified and installed to efficiently place the light on the task area and not beyond		
Area lighting with horizontally mounted asymmetric luminaires		

The following mitigation measures will be applied during the construction phase:

- Where possible minimise the height of lighting towers (to approximately 6m);
- Use the site cabins etc. to provide shielding of the lighting from beyond the site;
- All lighting will be aimed to where it is required utilising;
- Adhere to ILP/ CIE guidance; and
- Use the lowest power sources as reasonably practicable

Security Lighting

Twenty four hour security will be deployed during the construction of the site. The security team will utilise torches for routine patrols and working at night. Task lighting maybe utilised outside curfew hours to manage security incidents to ensure the incident is managed in a safe and efficient manner. Cuadrilla will track and record the use of task lighting and justification for its deployment outside curfew hours. The lighting will be deployed to focus on the task and where possible be below the horizontal plane.

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4.4 Wheel Washing and Site Cleaning

Once the new access has been surfaced a wheel cleaning facility will be installed immediately beyond the surfaced area. This is identified in drawing PNR-ARP-CH-013. A dry wheel wash system will be installed on the outbound lane of the new access road which all delivery wagons will have to drive over prior to leaving site during the construction phase.

The dry wheel wash unit uses a bar system which provides efficient wheel cleaning along with environmental benefits, e.g. no waste water, no diesel use, no concrete sump installation, no queues of vehicles waiting for the jet wash.

The wheel wash will be monitored by a trained operative to ensure that wagons are suitably clean to exit onto the public highway. The wheel wash is easily maintained and cleaned by lifting the unit, using the lifting points along the sections and removing the debris with a site based loading shovel or bucket. The dry wheel wash system will be monitored and cleaned out at least weekly or more often if required.

As a precaution a road sweeper will be kept on standby to ensure that in the unlikely event of debris or mud being deposited on the A583 then it will be cleared as soon as practicable. Site representatives will conduct daily visual checks during construction to monitor tracked mud being taken onto the public highway to inform whether a road sweeper is needed.

The dry wheel wash will typically be as shown in the photograph in figure 3. A standard system is approximately 20m long, with 2 x 3m on/off ramps and 2 x 7m centre sections and can clean up to 15 vehicles per hour if necessary.

Figure 3: Indicative photo of proposed wheel wash



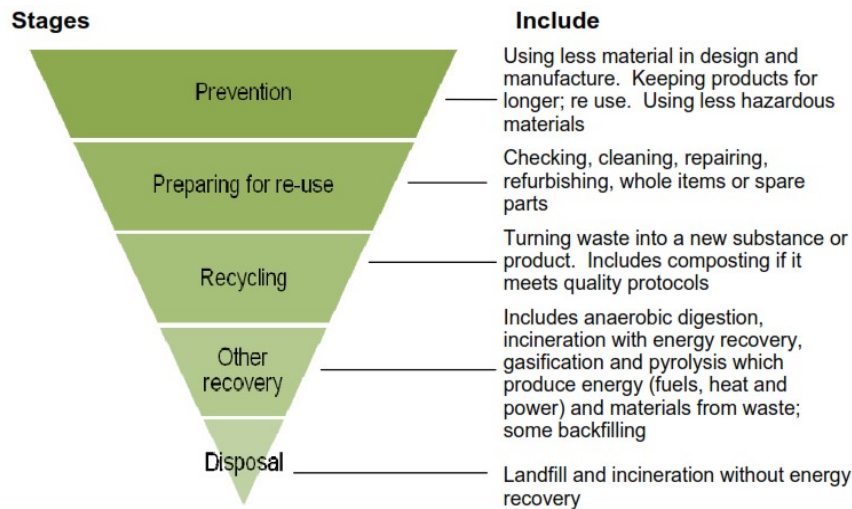
Once constructed the well pad and access road will be a combination of tarmac surface and aggregate. This will mitigate against mud and debris being tracked out onto the public highway. Regular visual inspections of the highway will form part of ongoing compliance checks conducted by operations during the lifecycle of the project.

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4.5 Waste (Scheme for Recycling and Disposal)

Waste will be managed in accordance with the waste management hierarchy, shown in figure 2 providing the best environmental option for disposing waste generated.

Figure 2: Waste Management Hierarchy



The list of waste expected to arise during construction are provided in Table 5 to be completed by the contractor on site:

Table 5: List of Construction Waste

Date of Review:								
List of Waste	EWC Code	Estimated Quantity (tonnes)	Actual Quantity Generated (tonnes) (calendar months)				Comments: Deviations from estimated quantity	% sent for recycling
			1	2	3	Total		
Vegetation	17 09 04	40					To be completed on site	To be completed on site
Concrete	17 01 01	2					To be completed on site	To be completed on site
Mixed Construction	17 09 04	32.2					To be completed on site	To be completed on site
Various Waste Oils and lubricants	13 07 03*	1					To be completed on site	To be completed on site
Other Waste Streams:	Please insert on site	Please insert on site					To be completed on site	To be completed on site

Source: Appendix Q Environmental Statement– Resource and Waste, Arup, May 2014

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Waste generated during the construction phase will be recorded per calendar month. Generated waste data will be sourced from Waste Transfer Notes and Consignment Notes. The waste contractor will provide a monthly report to Cuadrilla identifying the final location of the waste disposal and the percentage sent for recycling. Each month the waste generated will be examined to ensure it remains relevant, percentage levels going to recycling, ways to minimise waste generated and ways to improve waste management. The results of the review will be communicated to site operatives via tool box talks and site briefings.

To support the goal of achieving high levels of waste going to recycling, the site will contain an area dedicated to waste disposal. Separate labelled skips, covered and lockable, will be provided for individual waste streams e.g. office & welfare waste, timber, scrap metal, rubble etc. The purpose of segregating waste streams at source is to support the objective of recycling waste streams and preventing cross contamination. All waste will be transported by a licensed waste carrier to permitted waste disposal or recycling facilities.

A wash out area will be provided to allow concrete wagons to clean down prior to leaving site. The wash out area will be a visqueen lined skip situated on an impermeable membrane. Wash water will be left to settle and removed from site in tankers to a licensed recycling facility. Concrete remaining in the skip will be removed from site for crushing and recycling.

4.6 Watercourse and Drainage

All surface water (this does not include foul drainage which will be managed in compliance with condition 23) collected in the perimeter ditch and liquid waste streams will be transported off site for disposal to a permitted waste treatment facility. Unless otherwise agreed in writing with the Environment Agency the site will not discharge from site from the drainage system.

Fuel storage and refuelling will be conducted in a dedicated bunded area a minimum of 10m away from any drain or watercourse. The following control measures will be installed at site:

- Site Manager shall be responsible for overseeing and controlling the keys to the refuelling area to prevent unauthorised access;
- Briefing of environmental controls to all personnel for managing refuelling at site;
- All refuelling activities will be fully supervised;
- Trained spill responders on site;
- Fuel to be stored in a lockable, double bunded bowser;
- Bund area to have a capacity of at least 110% of the maximum capacity of the bowser or double skinned;
- Spill kits to be available at the refuelling area and inspected regularly;
- Drip trays/plant nappies to be available at the point of transfer of fuel/oil;
- All mobile plant to carry a spill kit appropriate to the type and size of plant;
- Static plant to be sited on drip trays or, ideally, plant nappies;
- Arrangements in place for a third party spill contractor to respond to spillages in the unlikely event the local controls cannot handle the spill; and
- Mobile plant to be returned to the site compound, or made secure, at the end of each shift to prevent unauthorised access.



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Any chemicals or raw material stored on site will be managed in accordance with the COSHH (Control of Substances hazardous to Health) Data Sheets. A purpose built, lockable COSHH store will be sited on an impermeable membrane to manage all chemicals.

Bulk deliveries of raw materials will be stored in a dedicated COSHH area. Liquid raw materials will be sited on an impermeable membrane to prevent leaks or spills contaminating the soils. The Site Manager will be responsible for the management of the COSHH area. As per the storage of fuel, spill kits and trained operatives will manage the storage of chemicals and raw materials. Where required sheeting may be deployed over raw materials to prevent damage from the weather subsequently preventing leaks, drips or dust emissions from storage of powder chemicals.

