DOCUMENT 7.7

nationalgrid

Drainage Report (Rev B)

The Yorkshire and Humber (CCS Cross Country Pipeline) Development Consent Order

Application Reference: EN070001

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Deadline 5

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1 Background

1.1 PURPOSE OF THIS DOCUMENT

1.1.1 National Grid has submitted an application for a Development Consent Order (DCO) for the Yorkshire and Humber Carbon Capture and Storage ("CCS") Cross Country Pipeline Development Consent Order described here as the Onshore Scheme.

1.1.2 Under Requirement 16 of the DCO (Document 3.1, Schedule 3) the Onshore Scheme must take place in accordance with the "drainage strategy". This document (Document 7.7) will form the drainage strategy as defined in Requirement 16 to be certified by the Secretary of State for the purposes of the Development Consent Order. Reference is made in this document to the Conceptual Drainage Design drawings (Document 7.7.1) submitted with the application, however, these will not form part of the drainage strategy.

1.1.3 The objectives of this drainage report are as follows:

- to describe the impact of the development on the existing drainage;
- to describe National Grid's approach to land-take with drainage in mind;
- to describe National Grid's approach to assessing the drainage need;
- to describe National Grid's requirements for the installation of drainage; and
- to explain aftercare.

1.1.4 National Grid plc owns and operates the national high-pressure gas transmission pipeline network in the UK and operates the national electricity grid in the UK. National Grid Carbon (referred to in this report as "National Grid") is a non-regulated independent subsidiary of National Grid plc created to develop Carbon Dioxide transportation and storage across the UK. National Grid will be drawing on its expertise in building and running safe and effective pipelines to develop CCS Projects

1.1.5 The Onshore Scheme will comprise the construction of an approximately 67km high pressure cross country pipeline. The associated connecting pipelines and above ground installations (AGIs) (namely a Multi-Junction,

Pipeline Internal Gauge Traps, three Block Vales and an Onshore Pumping Station) result in the total length being approximately 74km.

1.1.6 The DCO will grant powers to construct, operate and maintain the Onshore Scheme. National Grid recognises the effects the Onshore Scheme will have on agricultural field drainage and understands the implications of constructing and installing sub-surface linear pipelines across large distances of predominantly agricultural land.

1.2 KEY COMPONENTS OF AGRICULTURAL LAND DRAINAGE

1.2.1 The majority of the agricultural land along the length of the proposed pipeline relies on artificial land drainage to achieve its yield potential. Land drains provide a means whereby rainfall infiltrating into the soil can drain out of it without causing excessive waterlogging within the soil which would be detrimental to crop growth.

1.2.2 Land drains vary greatly in terms of their age, depth, intensity, nature, size and condition. Early drains were horseshoe clay tiles laid directly onto the soil with open bottoms. These were superseded in the late 19th century by round clay tiles which vary in size from the early drains, which were often only 25- 50mm in diameter, to the drains of the late 20th century which were 75mm in diameter. These clay tiles are usually 300mm long and were butt jointed together with the water from the soil entering the drain through the joints. Modern land drains consist of continuous lengths of corrugated plastic pipe with perforations through which the soil water can enter the pipe. Land drains gradually silt up over time but most existing drains retain some capacity and exhibit some useful function.

1.2.3 The number of drains found will vary enormously. Many old schemes consist of drains (laterals) laid at 5-8m spacings (laid in furrow bottoms when ridge and furrows still prevailed) running usually straight up and down the slope. More modern schemes tend to be wider spaced with laterals 10-20m apart and they are usually laid across the slope. On some of the flat lands where fields are often bounded by deep and well-maintained ditches, the lateral drains will have individual outfalls into the ditch. Elsewhere the laterals will be collected into drains which will consist of larger pipes – “main drains” - conveying the water to suitable single outfall points. The landform in the immediate local vicinity will determine the complexity of any drainage system.

1.2.4 In some fields occasional seemingly random drains will be present rather than an intensive scheme of laterals. These individual drains might be draining a spring or a particularly problematic site – such as peaty soils or a

low area. There are also sometimes present large carrier pipes where ditches have been infilled and culverted.

1.2.5 The type of land drainage encountered along the route of the pipeline depends on the nature of the land and the type of crops being grown. The soils along the route of the Onshore Scheme are very variable. There are areas of light textured soils which are permeable and free draining. Elsewhere there are heavy textured clay soils that tend to be only slowly permeable and subject to seasonal waterlogging. In general terms there are clays and silty soils at the southern end of the route, sandier soils around Holme upon Spalding Moor, free draining chalk on the Yorkshire Wolds, and then mainly glacial-derived boulder clays towards the coast at the eastern end of the pipeline route.

1.2.6 The majority of the route is in arable production and extensive land drainage is expected to exist along the entire route except the Yorkshire Wolds. For example on the heavy clay soils on flat land there are intensive systems of land drains; stone backfill is often found over the drains to help soil water move into them. Elsewhere the soils are free draining - for example on the Wolds chalk where there are no drains at all with a few springs at the periphery of the outcrop.

1.2.7 Land drains vary in depth but lateral drains are typically between 600 and 1200 mm deep whilst piped ditches and drains laid to intercept springs or perhaps to grade pipes through hills out of low areas might be very much deeper.

1.2.8 As-built Drainage Plans (Final Record Plans) of drainage systems installed have been made available for some of the fields along the route. Elsewhere information on existing drains can be obtained by speaking to landowners and occupiers, recording their knowledge, and by examining ditches, soil and land form to predict likely drainage need and schemes.

2 Potential Effect of the Development on Existing Drainage

2.0.1 The Onshore Scheme is expected to affect the existing drainage schemes across the agricultural land in three different ways.

2.0.2 Firstly, the digging of a trench to install the pipeline cuts through the many land drains that already exist. If left severed the water in the drains on the top side of the trench (i.e., the side from which the water would flow) would no longer be able to drain away and would build up causing waterlogging on and off site. This may result in extensive crop loss. However if main drains are severed, the water can force its way to the surface and potentially cause off and on site flooding. Furthermore the severed drainage can lead to excessive waterlogging across the working area which would lead to soil structural damage and would also generate a risk of silt pollution. It is therefore essential that mitigation is put in place so that drains severed during construction works for the Onshore Scheme are able to continue to function throughout and after construction.

2.0.3 Secondly, the top soils will be stripped from the pipeline working width and other working areas and the subsequent trafficking of construction vehicles on subsoil would damage many of the existing land drains along the running track. Mitigation will need to be put in place to maintain the integrity of the land drainage system during and following construction.

2.0.4 Thirdly soil structure can be damaged by the working and handling of the soils in poor conditions. Also the trafficking of vehicles can cause compaction of the subsoil. If the soils become more compact they will have a greater drainage need and requirement than they did in their former unworked condition. If measures to mitigate structural damage to soils during handling are not implemented, compaction is not alleviated and land drainage not remediated then this is likely to extend the period of time required for the soil to recover.

2.0.5 Mitigation is employed to ensure that these potential adverse effects on the existing land drainage are minimised. National Grid has developed substantial experience of constructing pipelines since the 1960s and has developed standards of appropriate land drainage mitigation.

3 Approach to Drainage Assessment Adopted by National Grid on the Onshore Scheme

3.0.1 For the purposes of the DCO application the Order Limits incorporate the land required to construct the Onshore Scheme, and in particular the Order Limits include:

- indicative pipeline route (an indication of a mostly central pipeline route alignment within 100m lateral limits of deviation);
- permanent easement width of 24.4m (area over which permanent rights are sought - which is defined by the alignment of the Pipeline);
- the working width (within which pipeline construction works will take place, which again is defined by the alignment of the Pipeline and is usually 36m wide increasing to 51m at major crossings);
- AGI working areas;
- Temporary Construction Compounds; and
- drainage areas (within which only drainage works are to be carried out).

3.0.2 Initially for the purpose of statutory consultation the DCO Order Limits were wide, to the maximum extent of those field boundaries where drainage was identified as potentially required, to allow some flexibility for the drainage design and the location of drainage outfalls. The announcement of the preferred scheme for the purpose of consultation in the summer of 2013 meant that there was sufficient development of the engineering design for the proposed pipeline route to allow the commissioning of a land drainage survey.

3.0.3 The drainage survey was required to understand the extent and working dynamics of the existing land drainage systems to inform the development of a conceptual drainage design for the Onshore Scheme and so reduce the extent of the DCO Order Limits.

3.0.4 Notification of entry for all surveys on the Onshore Scheme is arranged through an Agricultural Liaison Officer (“ALO”) appointed by National Grid. This is to agree any special access requirements and discuss any concerns, such as interference with farming operations; if there are no specific requirements a courtesy call is still made before taking access.

3.0.5 Agreement to carry out the drainage survey was obtained from the majority of landowners along the route. Where agreement could not be reached the wider Order Limits have remained around the existing field boundaries to remove the risk that potential drainage outfalls have been left outside the Order Limits. This remains to be the case for only Land Plan plots 383 and 387.

3.0.6 As the appointed drainage survey contractor was able to access and carry out surveys on the majority of the land, most of the existing drains and outfalls were identified and the Order Limits reduced accordingly. However, there remain other drainage areas that are noticeably wider but these are not the result of failure to obtain survey access. These locations remain wide due to the effect of local existing drainage and topographic characteristics and together with locations yet to be surveyed, are referred to as 'Flexible Drainage Areas.'

3.1 CONCEPTUAL DRAINAGE DESIGN DEVELOPED FOR THE ONSHORE SCHEME

3.1.1 The Conceptual Drainage Design (shown in Document 7.7.1) comprises an indicative drainage scheme based on the initial drainage survey. It serves to demonstrate to the relevant parties the land drainage to be installed prior to construction, during construction and following construction to enable land drainage systems to function in a way equivalent to former pre-construction conditions. However, the conceptual design may change within the order limits once specific on-site requirements become apparent.

3.1.2 Some remedial drainage works may be required beyond the immediate land temporarily required for construction; this in part has been the reason for the wider Flexible Drainage Areas. The required mitigation drainage will inevitably involve some works outside the main works construction working area (shaded dark and light grey on the Land Plans (Document 2.1)). These additional areas of land identified as potentially necessary to facilitate remedial drainage are shown as hatched on the Land Plans.

3.1.3 The drainage survey involved obtaining all available information on existing drainage, soils, cropping and land form. This involved collating any land drainage records and plans that were available and other relevant information obtained from discussions with landowners and occupiers. These discussions also allowed the landowners or occupiers to raise any other concerns they might have regarding drainage.

3.1.4 Site surveys were undertaken and adjacent ditches and watercourses were observed to identify any existing outfall pipes. Existing chambers and main carrier pipes were also located and recorded.

3.1.5 This information was superimposed onto an Ordnance Survey backdrop (the "Plan"). Old Ordnance Survey maps were then examined and any old field boundaries added to the plans. Most drainage schemes are field based and therefore an understanding of old field boundaries is indicative of main drain locations and also of any piped ditches.

3.1.6 The working area was then superimposed on the Plan together with any available topographical information.

3.2 NATIONAL GRID'S STANDARDS FOR DRAINAGE DESIGN

3.2.1 The Conceptual Design has been based on standards developed by National Grid over the past 40 years. These comprise:

- All identified existing land drains will be intercepted on the top side of the working area by new pipes (headers) of adequate size and depth running parallel with the pipeline. If there are no existing drains (for example on the chalk Wolds) then headers will not be required.
- If the direction of land slope falls in one direction then a single header on the top side would be required. However if the topography rolls with variable land slope then headers would be required on both sides of the working area.
- Suitable connections will be made between the old drains and the new pipes. This will normally be done using purpose-made junctions with badly silted drains likely to be connected into the new headers using permeable backfill (stone laid into the drainage trench).
- The new headers will, wherever possible, use the same outfalls as those used by the original drainage pipes and mains. If this involves any increases in drainage catchments or flows to existing mains then these will be upgraded or an offsite main installed to take the water safely into receiving watercourses. All outfalls will be within the Order Limits and will be subject to any necessary Internal Drainage Board, Local Authority or Environment Agency consents.
- The new headers will be installed at a depth just below that of the existing drains, unless specific on-site characteristics make such an arrangement impossible. This may require the dredging of the receiving ditches and watercourses in places where existing drains have become submerged or buried in silt.
- If topography, outfall locations or landownership boundaries mean that the headers have to cross the proposed pipeline ("cross-pipeline connections"), the number of such crossing places will be kept to a minimum. These drains, whether they are pre-existing or new mains, will be severed by the pipeline, and will have to be re-

connected so that the integrity of the field drainage is preserved throughout construction.

- Post-construction drainage shall be installed to ensure that the reinstated land is drained effectively. Following construction new drains will be installed (restoration drains) which will replace those that formerly existed within the working strip which will have been damaged or destroyed. Additional drains will also be required to help the soil structure recover quickly. These drains will have stone backfill (permeable fill) so that effective subsoiling can be undertaken (subsoiling creates cracks and fissures in the soil profile to break up the subsoil and alleviate compaction, the fissures created are run into the stone backfill of the drains).
- Wherever possible the restoration drains will run parallel with the pipeline. However in places it may be necessary to orientate these across the pipeline- for example to intercept steep slopes.
- Unless otherwise directed by National Grid, crossing of the pipeline trench by land drains will be kept to the absolute minimum whilst still providing an adequate drainage system.
- If drains have to be connected across the reinstated pipeline trench, for example, either the cross connecting headers or the continuation of severed field drains, National Grid will ensure that there is a firm bed prior to installation. In these circumstances, these drains will be supported by a concrete lintel and will be solid, not perforated, pipe. This is to maintain the integrity of the reinstated ground above the pipeline, that is, the prevention of the accumulation of water in this area will reduce the risk of subsidence. Before cross-connecting, the existing drains either side of the cross-connection will be cleared to the edge of the working width. The installation of drains over the pipeline is resisted wherever possible specifically to minimise the risk of subsidence, and the potential risk of subsidence to the integrity of the drainage system.
- All new land drains are to have an underdrainage function only. They will not be used for draining soil laden water from the working areas.
- Subsoiling and other soil loosening techniques are a crucial part of the soils' rehabilitation and will be undertaken, wherever required, following construction.
- Restoration drains may be required in areas where there are currently no existing drains. This will depend on the drainage and soils' need which will be determined following construction. Soakaway outfalls may be required if restoration drains are installed in these areas if there are no natural outfall locations.

3.2.2 Mitigating drainage requirements will not just be considered along the pipeline. Other areas, for example access tracks or temporary construction compounds, may also require the installation of headers and restoration drains.

4 Consultation

4.0.1 Since the early stages of the development of the Onshore Scheme in 2011, National Grid has been in regular contact with landowners and occupiers to gain access for environmental surveys, geophysical surveys and, in places, intrusive geotechnical investigations. Frequently landowners and occupiers have asked how the Onshore Scheme would affect their field drainage.

4.0.2 In addition to these contacts, National Grid held two rounds of voluntary consultations in June to August 2011 and June to July 2012, to ensure that landowners, occupiers and other stakeholders were kept up to date on the latest developments of the Onshore Scheme and had an opportunity to provide feedback and raise any concerns.

4.0.3 Statutory consultation and publicity for the Onshore Scheme in accordance with sections 42, 47 and 48 of the Planning Act 2008 was undertaken from 23rd September to 2nd November 2013. As part of which, nine public exhibitions were held at locations along the Pipeline route. These exhibitions lasted for five hours, with the first hour of each event given specifically over to landowners and occupiers of the land within the Order Limits. These persons with interests in land ("PILs") were specifically invited to attend to discuss the Onshore Scheme and talk through any concerns; drainage matters were, as expected, frequently raised.

4.0.4 Following these consultation events National Grid contacted all landowners who did not attend the consultation events and offered to arrange meetings to discuss the Onshore Scheme and their own concerns. During these meetings landowners were asked about land drainage to enable National Grid to benefit from their site specific knowledge and experience. Copies of relevant drainage plans were also requested for use by National Grid - these requests were well received and copies were provided where available.

4.0.5 A review of feedback from the statutory consultation also confirmed that a common concern raised by landowners and occupiers was the effect the scheme would have on the drainage, how National Grid are to protect these during construction, and how National Grid is to ensure they are correctly reinstated post construction.

4.0.6 On completion, the drainage survey resulted in a reduction of the Order Limits to the working width with 'thin strips' of order land protruding out to

the relevant outfall locations. The results of the survey led to the preparation of Conceptual Drainage Design drawings (Document 7.7.1).

4.0.7 The Conceptual Drainage Design drawings have been discussed with landowners as they relate to their land and feedback has been noted. In some cases the Conceptual Drainage Design has been amended to accommodate landowners' and occupiers' preferences. National Grid will continue to consult and liaise with landowners and occupiers throughout the whole process of drainage design and installation.

5 Drainage Works

5.1 REVIEW OF CONCEPTUAL DRAINAGE DESIGN

5.1.1 Prior to construction the Conceptual Drainage Design drawings (Document 7.7.1) will be reviewed again in liaison with the relevant landowners. This is to take into account:

- changes to the Pipeline route made (within the Limits of Deviation set by the DCO) during detailed design;
- changes made to the pre-existing land drainage systems since the preparation of the plans;
- changes on the land since the preparation of the plans; and
- any additional information that may be available either from the landowners records, or internal drainage boards/ lead local flood authority and Environment Agency.

5.1.2 Additional surveys will be carried out as required. Where surveys have not been completed to date a survey will be undertaken prior to entry for construction to identify the outfall locations within the order limits.

5.1.3 The drainage survey undertaken to date identified some drains where the location, size, condition and depth are not precisely confirmed. The Conceptual Drainage Design is based on certain assumptions that have been made in relation to those drains.

5.1.4 Intrusive investigations (using an excavator) may be required at certain key places to accurately determine the location of drains that would be intercepted, and that may provide an outfall for headers.

5.1.5 The results of these additional consultations, surveys and investigations could necessitate changes in the design. However these changes will not require any drainage outside the DCO Order Limits. In effect these changes will evolve the conceptual design to the detailed design.

5.1.6 All relevant and necessary consents will be obtained before drainage works begin from the relevant Internal Drainage Board / Lead Local Flood Authority and, in the case of outfalls to main rivers, the Environment Agency.

5.2 PRE-CONSTRUCTION DRAINAGE

5.2.1 The Detailed Design will identify places where header drains are required to intercept the existing drains. These drains will be installed when the working width (typically 36m wide) has been delineated/ fenced but prior to the main construction process and generally before any top soils are stripped from the working width. These header drains will be installed at a depth just below that of the existing drains and will be of adequate size to take the peak flows from the areas they drain.

5.2.2 The purpose of these drains is to ensure that all existing land drains that are severed by the new pipeline are intercepted and taken to a new suitable outfall. This ensures that there is no damage to existing drainage schemes, maintains the crop growth and development outside the area taken for construction, and also helps to keep the working area dry.

5.2.3 The headers will require outfalls. Wherever possible these will be taken directly into existing ditches but in many places they may outfall into existing drains which run across the pipeline working width. This will therefore require the cross drains to be taken over the new pipeline to, wherever possible, existing mains on the other side of the working width. If the existing mains are not suitable then new offsite mains are required to take the water from the headers across offsite land to discharge into a suitable ditch or carrier pipe. These can be accommodated within the Order Limits. Such drainage works outside the working width will typically require a strip of land 10m wide.

5.2.4 The working width is fenced off and the top soil is stripped and stored to the side. The subsoil is excavated from the pipe trench and stored on the opposite side of the working width to the topsoil to avoid any contamination.

5.2.5 As-built Drainage plans will record the existing drains that are connected into the new header and the location and depth of the newly-installed drainage pipes. Any drains severed during trenching activity will be recorded and the number checked against the drainage design drawings to ensure that they have all been located and connected into the new system. Any variation from the drainage design due to conditions on site will be recorded on the As-built Drainage Plan.

5.3 CONSTRUCTION DRAINAGE

5.3.1 Cross drains that have been installed as part of the pre-construction drainage to take water from the header to the outfall will be severed during the excavation of the pipe trench. During construction these drains will be replaced immediately and maintained throughout construction. The cross

drains will have adequate support to prevent any potential problems caused by subsequent settlement in the pipeline trench. The integrity of the cross drains will be checked at the end of the construction period.

5.4 POST-CONSTRUCTION DRAINAGE

5.4.1 Post –construction restoration drains will be laid following installation of the pipeline but prior to the reinstatement of the topsoil. These drains replace the original ones that will have been damaged or destroyed by the construction process. In combination with soil loosening they will assist soil rehabilitation by facilitating water movement through the soil.

5.4.2 Restoration drains will normally be laid parallel with the pipeline. The number of drains required will depend on the amount of soil structural damage that occurs during construction. The post- construction drainage system is installed as per the detailed design but if any unidentified drains are discovered during construction within the working areas they are connected into the new system.

5.4.3 Restoration drains will be installed wherever required that is, not just along the working width but all other areas of land taken temporarily for construction that are adversely affected by the construction process. This includes, for example, land used for temporary construction compounds.

5.4.4 Restoration drains will outfall directly into ditches or into existing mains. As-built records will be kept of all new restoration drains laid.

5.4.5 The subsoil is also deep-ripped (“subsoiled”) across the working width to a depth below that of normal cultivations following reinstatement. This removes compaction (which exacerbates poor drainage) and the top soil is then reinstated when weather, soil and site conditions are acceptable. Once completed a set of As-built Drainage plans are given to the landowners and occupiers for their records.

5.4.6 During construction a National Grid drainage inspector is present at all times to monitor and record the drainage installation to accurately compile the as-built drainage plans. In addition, the landowner or occupier can access the working width during construction to monitor the works and check the drainage. This can be arranged by contacting the Agricultural Liaison Officer (ALO) to ensure that there is adherence to site safety and security requirements. Each landowner and occupier is given contact details of the appointed ALO with whom they can liaise in advance of National Grid taking possession. In the majority of cases the ALO will already have met with the landowners and occupiers to discuss the Onshore Scheme.

6 Drainage After Construction

6.0.1 The land drains and systems are the property and responsibility of the landowner, or occupier in some cases of tenanted land. Therefore either the landowner or the occupier is responsible for all routine maintenance and repair.

6.0.2 If, however, after construction the landowner or occupier can demonstrate that National Grid's activities have caused a fault with the field drainage, either that laid by the Onshore Scheme or elsewhere on the land but as a result of the Onshore Scheme, National Grid will either repair any damage or compensate for any reasonable losses and costs incurred as a result of the fault.

6.0.3 As landowners and occupiers are on the land significantly more often than National Grid, and are therefore more familiar with their own land, they will be in a first-hand position to observe and report any issues and defects. This is especially the case at key times in the agricultural calendar when they take access for farming operations. Landowners and occupiers are more than often concerned about post-construction defects and the impact on cropping yields so invariably report matters promptly to National Grid.

6.0.4 Defects are reported to National Grid (to, for example, National Grid's Lands department or pipeline maintenance technicians), or via their land agents, who would in turn report to National Grid. Once reported National Grid will jointly inspect with the landowner or occupier, and where necessary and appropriate a remedial plan is agreed. National Grid will either seek to agree a remedial plan with the landowner or occupier, or agree a suitable compensation package to enable the landowner or occupier to address the defect himself.

6.0.5 However, in the absence of reaching an agreement, National Grid would be able to make its own judgement of the appropriate remedial measures. National Grid would use the powers, if awarded, under Article 28(4) of the draft DCO. This requires that National Grid must restore the land to the reasonable satisfaction of the landowners once it has given up possession taken temporarily. Further, Article 28(5) provides the landowner with an entitlement to compensation "for any loss or damage arising from the exercise in relation to the land of the provisions of any power conferred by [Article 28]."

Glossary

As-built Drainage Plan	A plan depicting the drainage in the field, usually prepared by a drainage contractor or National Grid following installation of a new drainage scheme.
Flexible Drainage Areas	Areas outside the pipeline working width required for land drainage only.
Header drain	A new length of land drain, usually installed parallel to the pipeline on the upslope side, for the purpose of intercepting existing land drains severed by the pipeline and discharging to a suitable outfall. A header drain may also be referred to as a 'cut-off', 'interceptor' or 'connector' drain.
Soakaway outfall	An excavated pit in the subsoil that is infilled with drainage stone to facilitate drainage away from the reinstated area. Usually installed where no alternative natural outfall locations are available.
Subsoiling	A process by which cracks and fissures in the soil profile are created to break up the subsoil and alleviate compaction. The process comprises a rig of tines that is towed trough the soil either by a bulldozer or a tractor. May also be referred to as deep tining or ripping.
Restoration drain	Drainage that is installed post-construction to enable drainage and restoration of the reinstated soils; also referred to as post-construction drainage.
Running track	The section of the working width comprising exposed subsoil that is used for vehicle access along the pipeline route during construction.
Temporary construction compounds	Temporary areas set up to accommodate site offices, workshops, stores for materials and equipment, waste management areas, and pipe storage areas, among others, to support the construction of each stage of the authorised development.
Top-side	The upslope side of the working width.
Working width	Area within which the construction and installation of the pipeline is carried out. typically 36m wide but increased to 51m where the pipeline needs to cross obstacles such as roads, railways, watercourses other pipelines etc.