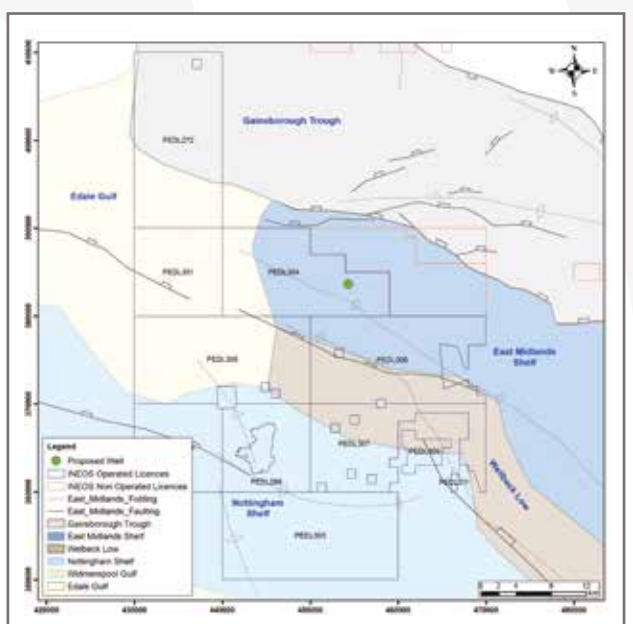
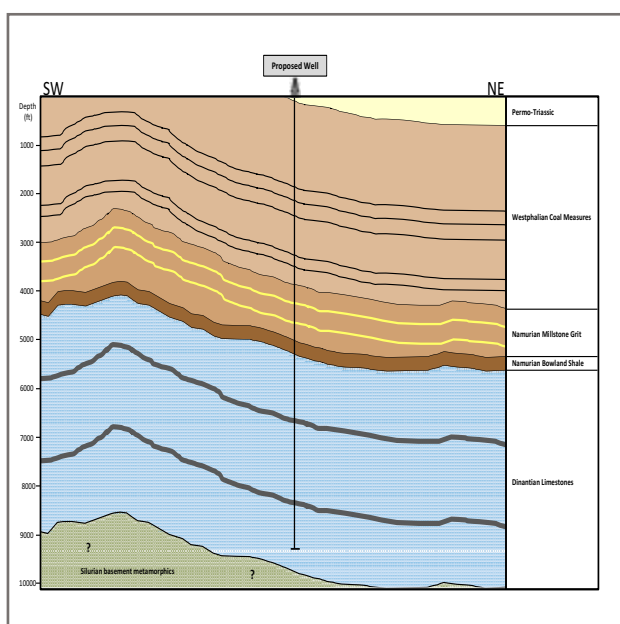
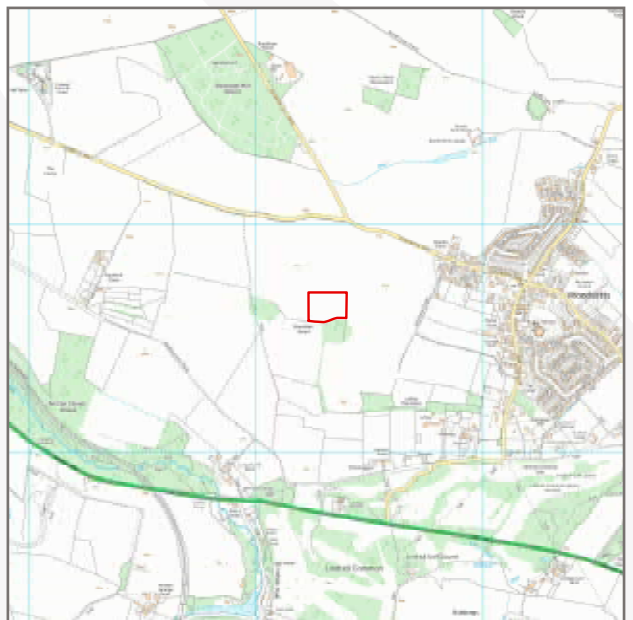
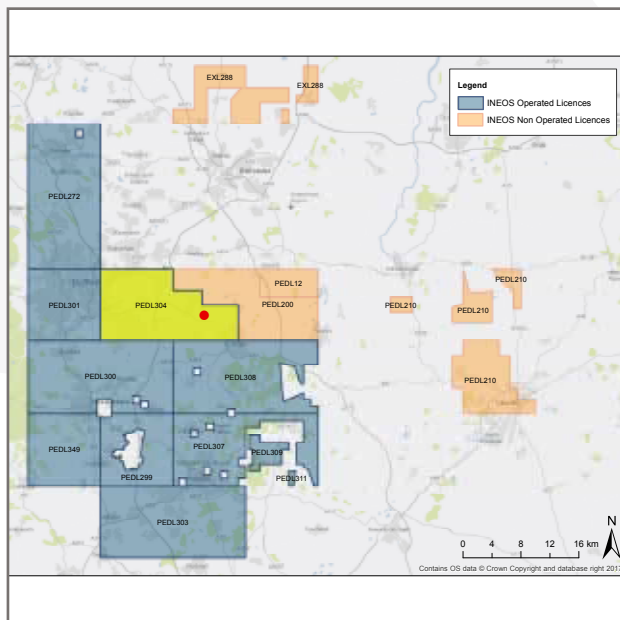


SITE LOCATION

Land to the south of Dinnington Road, Woodsetts was chosen following analysis of existing geophysical data.

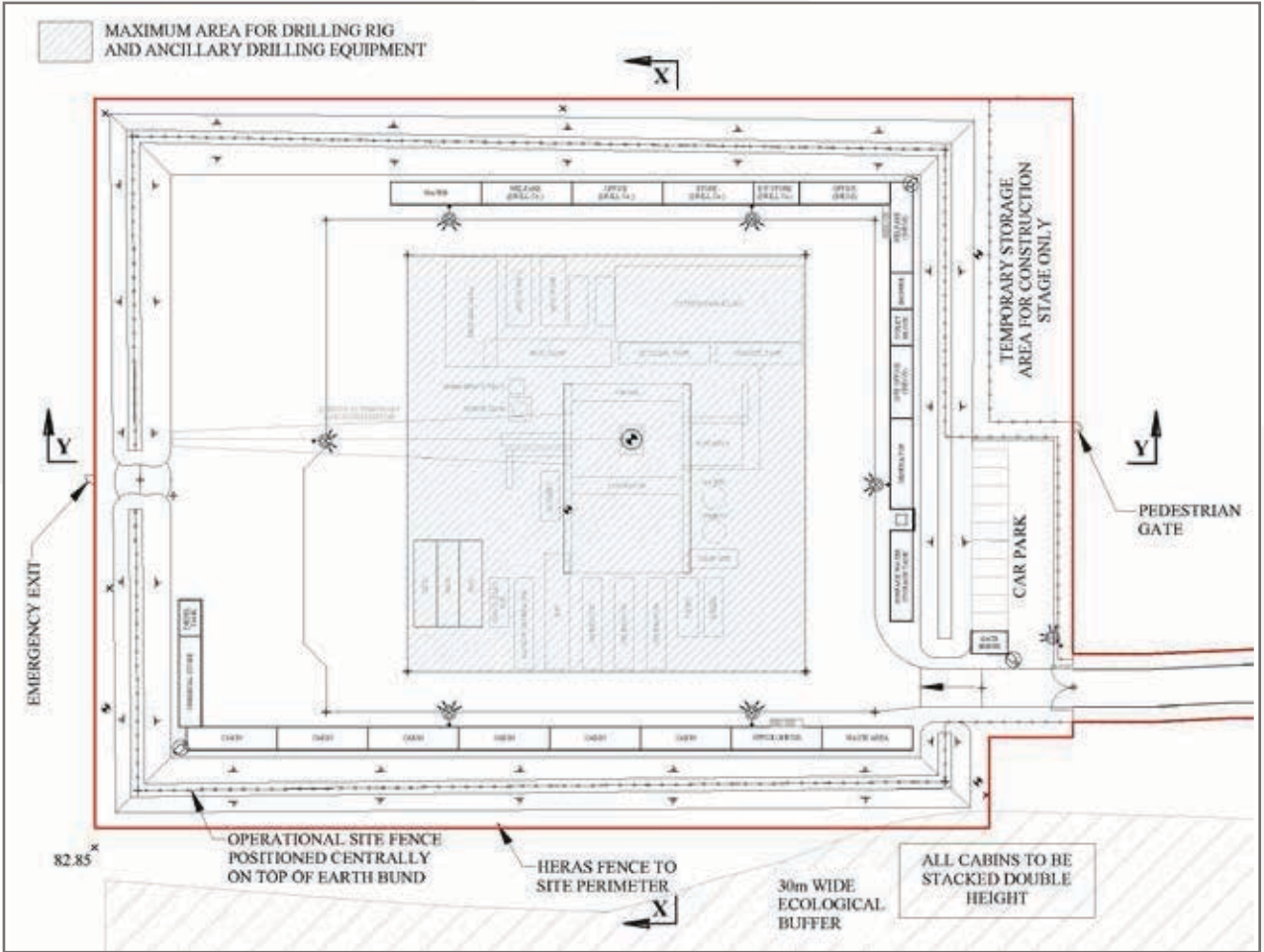


We also took into account the following surface considerations:

- Environmental designations and scheduling
- Agricultural land
- Restrictions in Local Plans
- Groundwater protection zones
- Flood risk areas
- Possible presence of protected species
- Local residences and buildings such as schools and hospitals

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PROPOSED DEVELOPMENT



Stages over the proposed five-year life of the site.
The plan shows the site at **Stage 2**.

Stage 1: Site Development and Establishment – approx. three months

Stage 2: Drilling, Coring and PTT – approx. five months

Stage 3: Maintenance of the Suspended Well Site – retained until restoration

.....
: **Stage 3a:** Possible workover of the
: Suspended Well – up to three weeks
: *Only if required*
: **Stage 4:** Possible Listening Well
: operations – up to three weeks
:

Stage 5: Well decommissioning and site restoration – approx. six weeks

Safety

- Well safety equipment will include a blow-out preventer, vent for emergency venting of gas and methane and radon monitoring
- Emergency response plan would be in place
- Pollution prevention measures including bunding, spill kits and training of staff

WELL DECOMMISSIONING AND SITE RESTORATION



Stage 5: Well decommissioning and site restoration

Well decommissioning

- Mobilisation of workover rig (up to 32m) with lighting, generators and low-level kit
- Cutting the casing 2m below ground level and plugging the well using cement in accordance with the Borehole Regulations

Site restoration

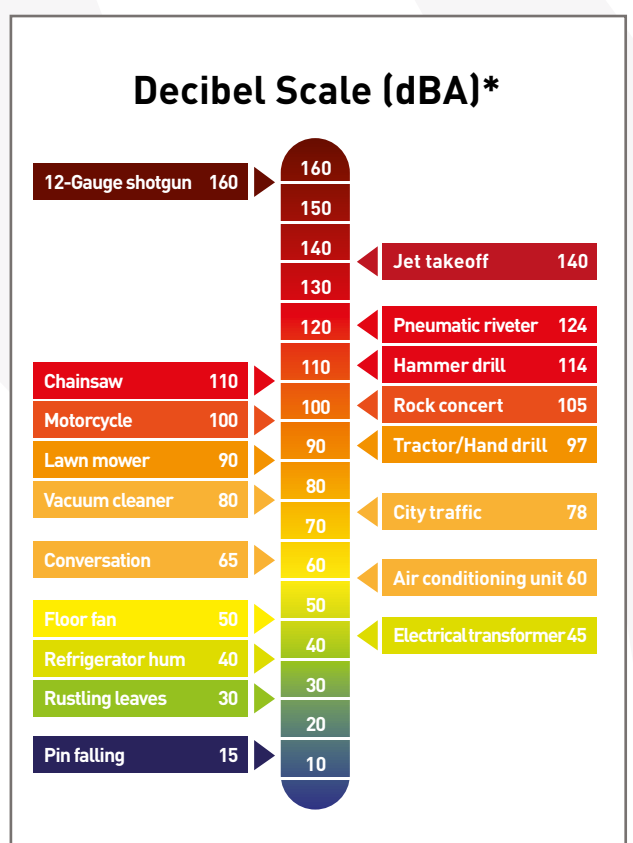
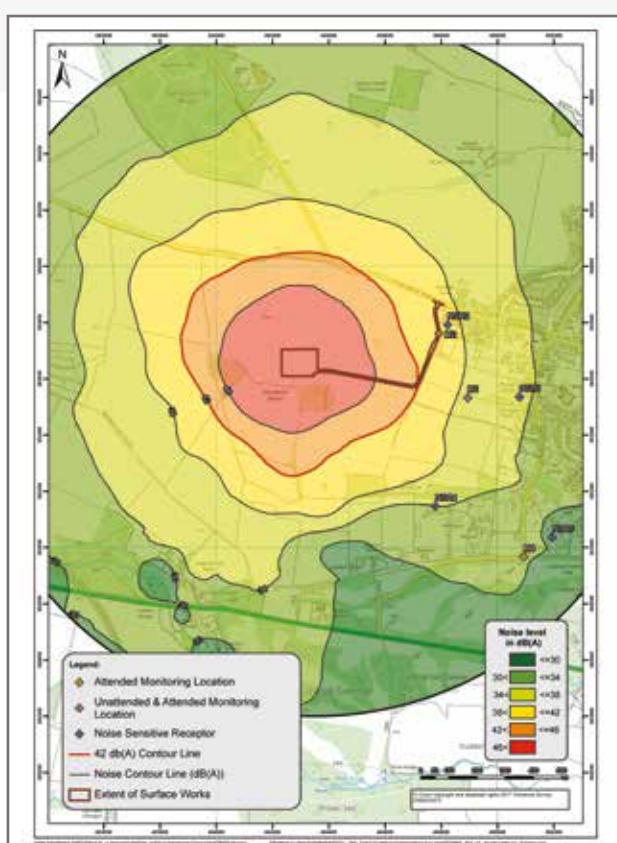
- Removal of site hardstanding, concrete pad and cellar
- Removal of drainage perimeter pipe and site membrane
- Replacement of soils onto site in appropriate weather conditions
- Restoration of site to previous use (agriculture) including reinstatement of field drains
- Restoration of road modifications as agreed with landowner and Highways Authority

NOISE IMPACTS

A noise assessment was undertaken covering construction, drilling and coring activities.

Construction noise may be audible at times but will not exceed regulatory criteria.

The proposal has no significant adverse impacts on amenity.



The project has been designed to have noise levels within the night time noise criteria of 42dB. This is also well within the evening and daytime noise criteria at the nearest house.

Mitigation measures:

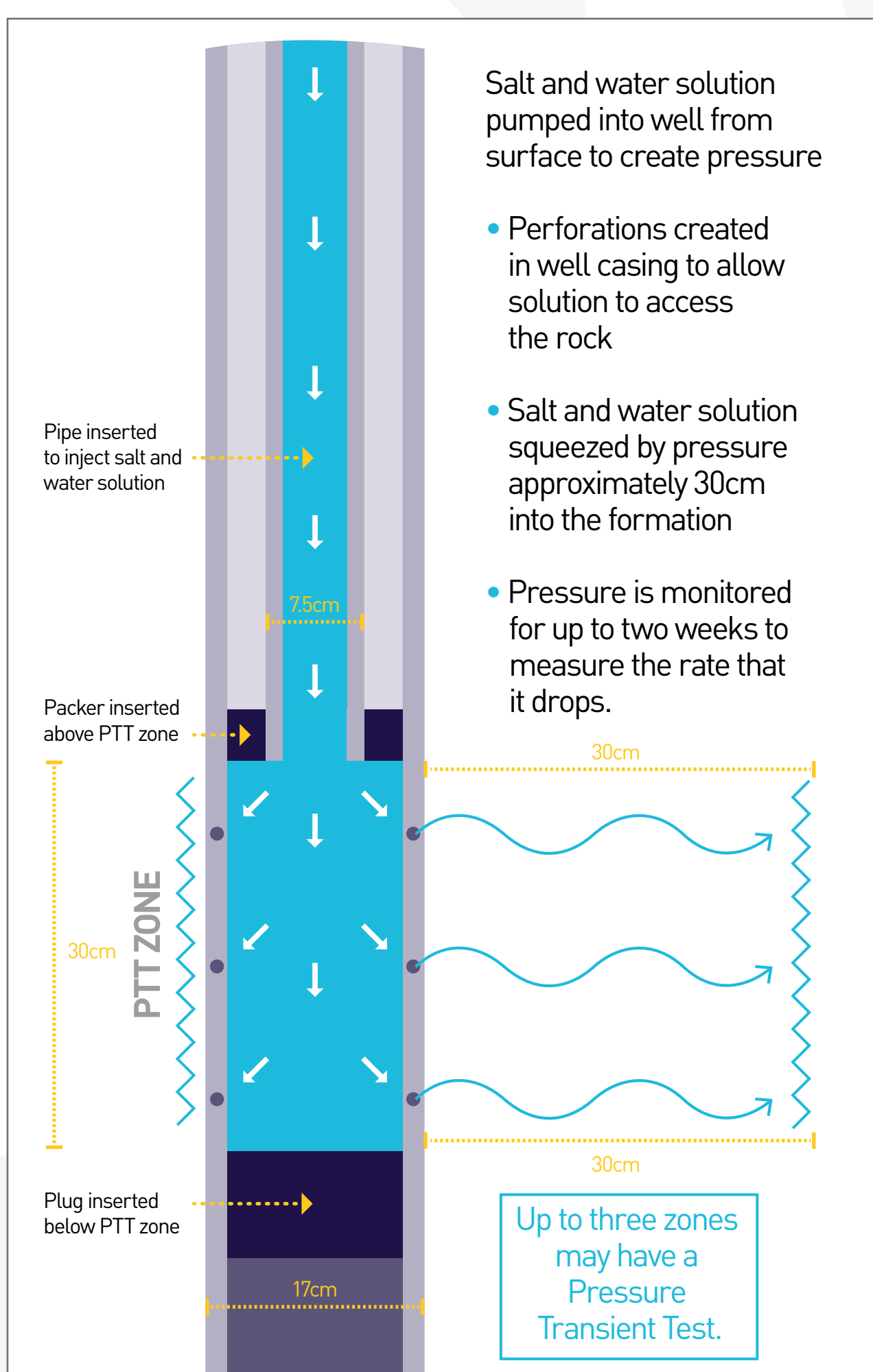
- Use of bunds, screens and double stacked cabins
- Positioning and rotating equipment
- Use of silencers, low noise equipment or enclosures
- Management of vehicle movements and audible vehicle reversing alarms
- Regular maintenance to minimise noise generation

PRESSURE TRANSIENT TEST (PTT)

A PTT is a short duration operation where a small amount (up to 10m³) of a salt and water solution is pumped into a zone within the wellbore and squeezed approximately 30cm into the formation.

The rate of pressure drop in the well will be monitored for two weeks.

This data will indicate if the reservoir is over pressured (encouraging for gas production) or under pressured (less encouraging for gas production).



TRAFFIC MOVEMENTS

- <7.5 Tonnes (light vehicles and crew buses) c.28%



- >7.5 Tonnes (HGV's) c.71%



- Abnormal loads c.1%



- Maximum daily HGV movements 60 (30 vehicles)

Stage	Movements*	Average Daily	Peak Daily	Total days
Construction	2,300	28	70	84
Drilling, Coring & Suspension	3,500	25	70	140
Restoration	1,650	39	60	42
Intervention**	400	25	55	16
Listening operation**	900	25	50	35

* A movement is considered as being either an inbound or outbound trip; i.e. one HGV arriving then departing the site would equal two movements.
**Intervention and Listening Operations only if required.

Measures to protect the environment

Easements for utilities

A 3m standoff from pipelines. Underground cabling will be fenced off. Easements of 3m for overhead powerlines and 1m from roads will also be maintained for all works. A full utility search will be carried out at the site.

Surfacing and lining of site

The site will be lined with a protective geotextile and impermeable geomembrane covered with aggregate. The liner will be installed by a specialist subcontractor and weld jointed to ensure it is watertight. A concrete pad/hardstanding and wellhead cellar will be developed in the site centre for the rig and core well. These will be bunded and separate from the site perimeter drainage system. The cellar will be welded to the membrane to maintain membrane integrity.

Chemical storage

Drilling muds and fuel for the rig and generators will be stored in double skinned steel tanks. Drip trays will be provided under refuelling points and standing machinery.

Site drainage

Surfaces graded to 1/100 fall to ensure that fluids do not pool and become a hazard. Site and drainage sized for a 1 in 100 year flood event. Surface water run-off from the drill floor or spilled fluids will be channelled to a dedicated tank. Surface water run-off from the remainder of the site will flow to a drainage and water storage pipe at the perimeter and collect in a sump/catch pit from where it will be pumped into a double skinned tank. Drainage pipework installed and backfilled with granular material in layers to required depths. Catch pits formed with uPVC inspection chambers and covers. All water will be removed from the site for treatment.

Public Road

Junctions would have appropriate visibility splay for the largest site vehicles.

Boundary treatments

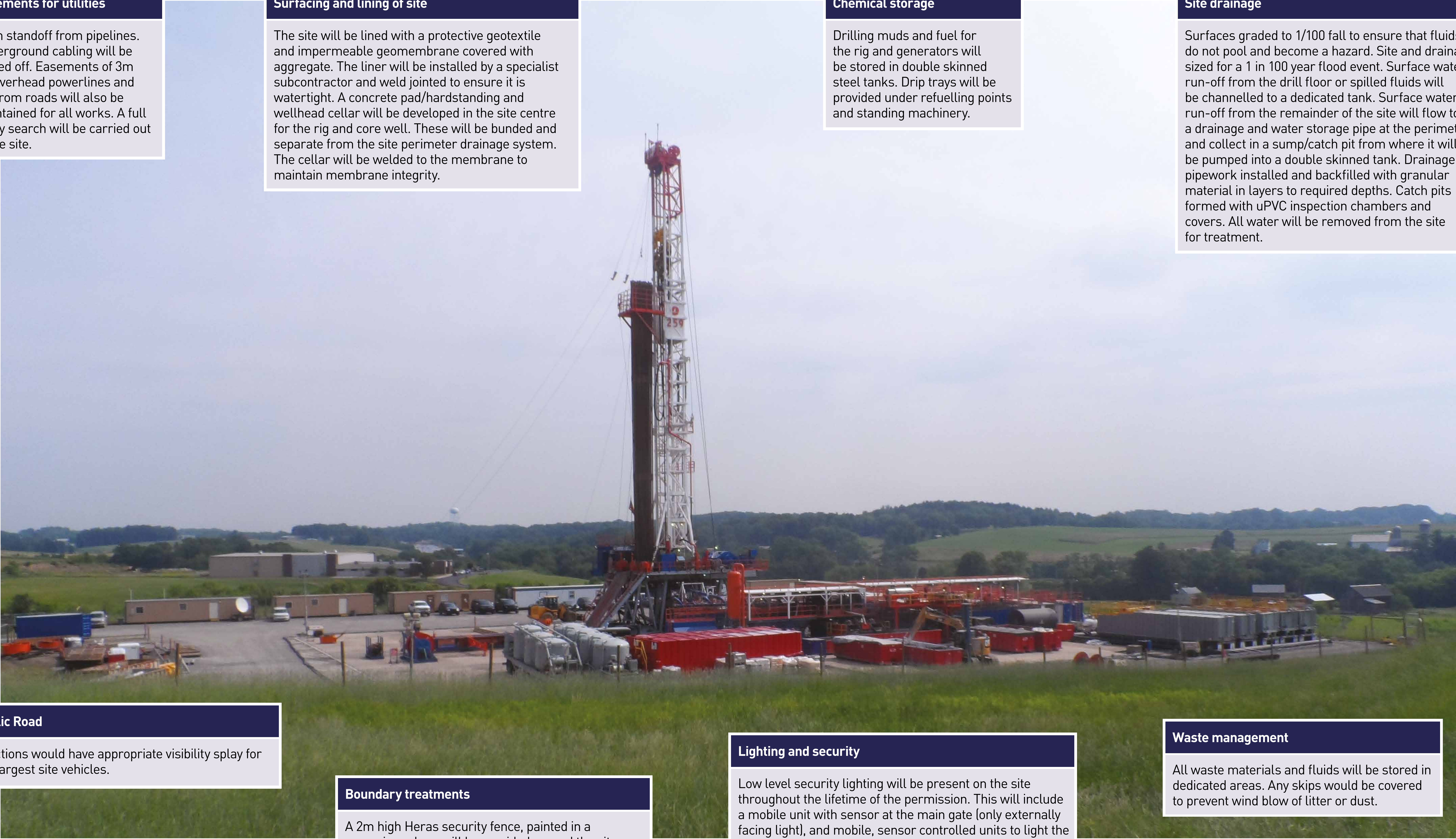
A 2m high Heras security fence, painted in a recessive colour, will be provided around the site perimeter, which will be anchored in the ground. Between the fencing and the site compound, soil bunds up to 2m high and 6m wide with 45 degree batters will be constructed. The bunds will be covered with a grass seeded geotextile blanket.

Lighting and security

Low level security lighting will be present on the site throughout the lifetime of the permission. This will include a mobile unit with sensor at the main gate (only externally facing light), and mobile, sensor controlled units to light the compound floor as needed (approx. 5-9m tall). Lights will be designed to have minimal upward light output rating. Lighting will be angled down and into the site. CCTV will be installed at the site.

Waste management

All waste materials and fluids will be stored in dedicated areas. Any skips would be covered to prevent wind blow of litter or dust.



GENERIC FEATURES OF THE PROPOSED VERTICAL CORE WELL SITE THAT WOULD BE CONSTANT THROUGHOUT OPERATIONS

N.B. Photograph shows features that would not be present throughout operations, but illustrate a standard, similar site at one stage (drilling – Stage 2).

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Features of the vertical core well site during construction

Vegetation removal and stripping topsoil

All soil will be kept separate from other construction activities for restoration. Top 300mm of topsoil will be used for bunding.

Lighting

During construction site lighting will be supplemented with additional mobile, construction lighting masts.

Monitoring boreholes

Installed to allow ongoing monitoring of groundwater.

Site area

The site area has been designed with 1 in 100 falls to channel water to drainage/ water storage on site. Ramps developed for safe access and egress from hardstanding areas. Pedestrian segregation fencing placed on all sides of hardstanding area. Concrete pad developed in centre of site for rig. Drilling platform will comprise 300mm deep reinforced concrete strips lying on waterproof HDPE liner and geotextile membrane.

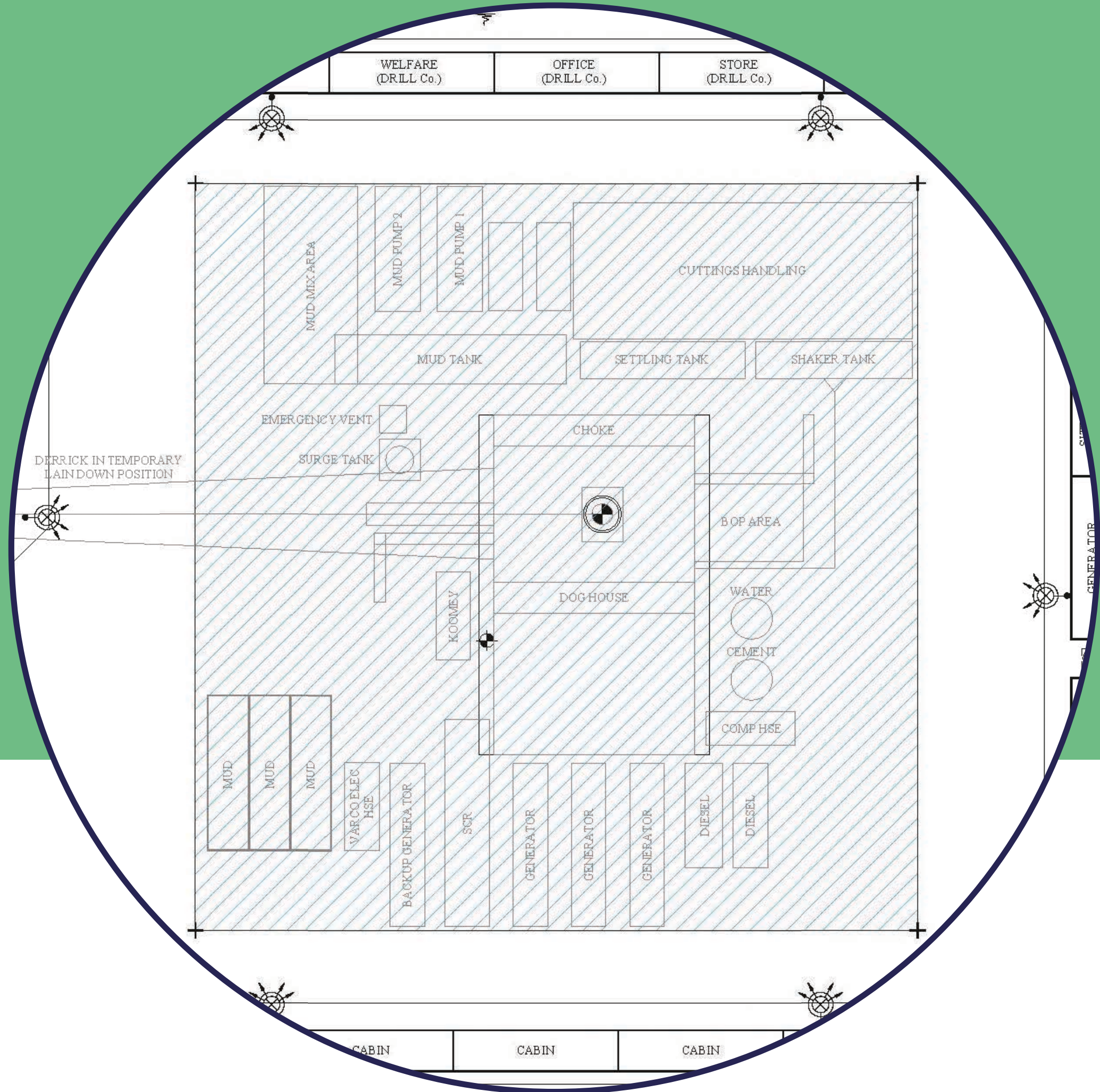


Cut & fill

If the site requires to be levelled, cut and fill may be required. The ground profiling required will be determined at the detailed site design stage and would not affect timings or numbers of plant and equipment required. A balance of cut and fill will be established to keep 'cut' material on site.

Soil bunding

2m high x 6m wide soil bunds formed from topsoil scraped from the site. Subsoil will be stored separately if required. Soil bunds will be grassed with a seeded geotextile blanket to improve stability and provide visual as well as acoustic screening.



Accommodation and welfare facilities

Offices and welfare facilities will be provided to accommodate personnel and space for workshops and storage. Site facilities, toilets and shower blocks are self contained and not connected to sewer. Solid and liquid waste are removed from site by licensed contractor as needed.

Features of the vertical core well site during drilling and coring

Drilling fluids

Drilling fluids are used to cool the drill bit and to circulate drill cuttings back to the surface. The fluids will be stored within a closed-loop system comprising mud pumps and mud tanks with cuttings removed as they are circulated from the well.

Safety equipment

The well is not a production well so no flare is proposed on site, though the rig would incorporate a blow out preventer, methane monitoring and an emergency vent, in the unlikely case of an unexpected gas release.

Drilling rig

Up to 60m high. Additional lighting required to light mast and rig floor for night working. The lighting will be low intensity and angled to the floor to prevent overspill and angled away from sensitive receptors.

Vehicle circulation

A one-way vehicle circulation system will operate on site.

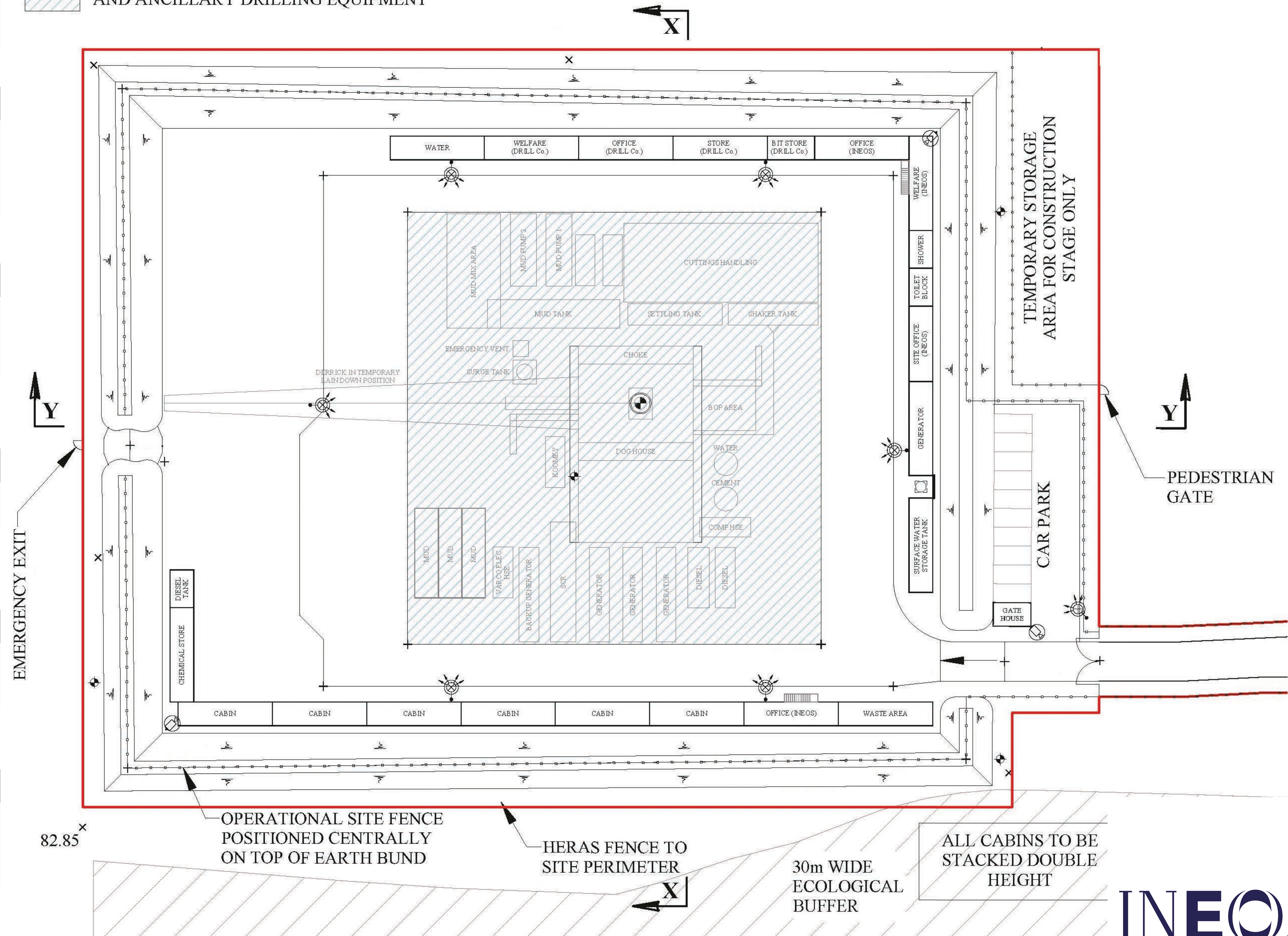
Cabins

Cabins stacked up to two units high will be placed around the perimeter of the site to provide additional acoustic screening.

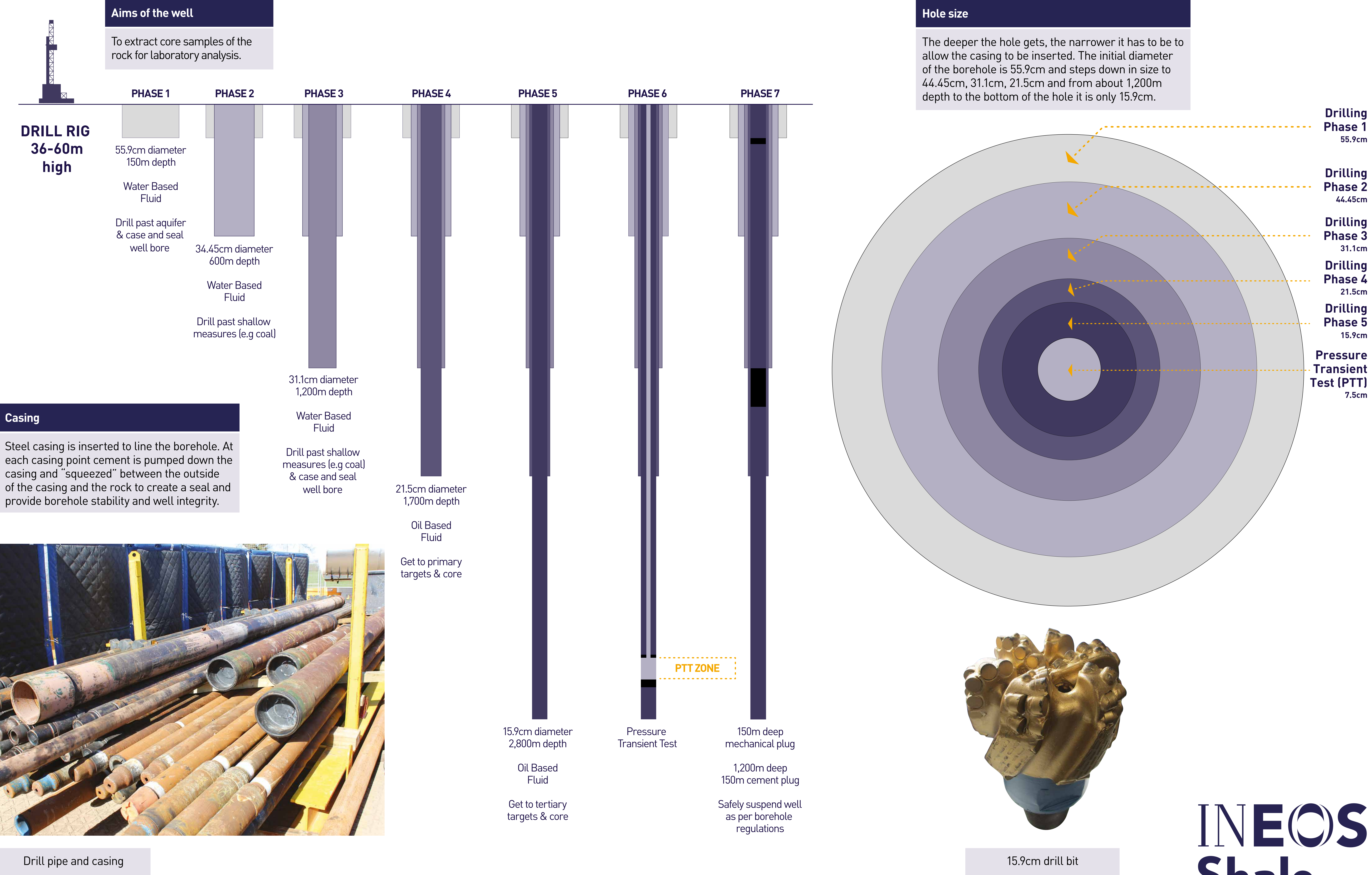
Waste

Solid and aqueous waste, including cuttings, waste mud and cement, will be stored in a designated area in enclosed tanks where necessary and removed by a registered waste contractor.

MAXIMUM AREA FOR DRILLING RIG AND ANCILLARY DRILLING EQUIPMENT



Features of the vertical core well during drilling, logging and PTT



Environmental assessment

Landscape and visual

A Landscape and Visual Impact Assessment has been undertaken in accordance with the Guidelines for Landscape and Visual Impact Assessment, third edition (GLVIA3). The assessment has considered the visibility of the project from local receptors and in relation to the landscape character of the area. The site is located within the East Rotherham Limestone Plateau and 750m to the northwest of the Ryton Farmlands Landscape Character Areas (LCA).

The assessment shows there will be moderate to substantial effects during the drilling and coring stage, particularly within close proximity to the site. Once the drilling is completed it is considered that the landscape impacts will be minor, with the exception of short periods when a rig may be brought onto the site for maintenance of listening activities and during the decommissioning stage. After five years the site will be restored to its current use.

The figure shows the local viewpoints which have been assessed.



Cultural heritage

An assessment has been undertaken of the historic use of the site and potential for archaeological features. This assessment has also consider the potential for effects on the setting of surrounding heritage features.

No impacts on identified cultural heritage assets are predicted as a result of the proposal. The 60m drilling rig will be visible within the setting of four designated assets (Grade II Listed Buildings). However, it is temporary and as a result of the distance between the assets and the components of the proposal, is not predicted to result in a significant long term effect on the setting of these assets.

Desk-based work, including historic aerial photograph analysis and historic map regression, has identified the potential for unknown buried archaeology within the site. The possibility of discovering buried archaeology during ground disturbance works would be managed through standard archaeological investigation processes during the planning and construction process including a non-intrusive geophysical survey in relation to the site.

The figure shows a summary of some the heritage features considered during the assessment.

Ecology

An extended Phase 1 habitat survey has been undertaken in accordance with Joint Nature Conservancy Council guidance. The proposal site is situated wholly within an arable field. The habitat which will be used for the site is of low ecological value, but could support ground nesting birds, typical of farmland areas. Standard approaches will be adopted to avoid any direct effects on breeding birds during site clearance.

Dewidales Wood, to the south of the site, is a Local Wildlife Site and listed Ancient Woodland, this habitat could support a range of birds and other protected species. The woodland will not be directly affected and the site design includes a buffer zone of 30m to the wood to reduce the risk of effects. This buffer accords with guidance to avoid disturbance to protected species and ancient woodlands. Bat activity survey are currently being undertaken, to date a low number of bats have been identified foraging along the northern edge of the wood and westwards. Light modelling work will be undertaken to develop a design which minuses light spill on the woodland edge and connected hedgerows.

Ecological enhancement recommendations would include planting the gaps in the hedgerow linking the two sections of Dewidales Wood with native species of local provenance, including fruit and berry bearing species.

Water environment

The site has been designed to be self contained in relation to surface and ground water meaning there are no discharges from the site to the surrounding water environment.

The site within an area containing the Cadeby Formation Principal Aquifer, Pennine Upper Coal Measures Secondary B Aquifer, and Pennine Middle Coal Measures Secondary A Aquifer. The drilling operations will pass through these underlying aquifers, however, effects to them will be avoided through the drilling and well design including the use of multiple casings, a closed loop mud system and the use of low toxicity drilling muds .

The nearest surface watercourse, within hydraulic connection of the site, is Owlands Wood Dyke, located approximately 1.1km east of the site. Anston Brook is technically closer to the site (approximately 820m to the south) however this watercourse is within a separate catchment and is not hydraulically connected to the site.

The site is not within an area at risk from flooding.

The figure shows the nearest surface water course locations.

Emissions to air

The proposed operations are similar in scale to impacts from a construction site. Dust impacts during the construction of the site will be controlled by using good practice measures e.g. dust suppression during soil stripping, bund formation and site restoration. Vehicles leaving the site will be cleaned to prevent mud being deposited on local roads.

The maximum number of vehicles per day, including HGVs, will be up to 70 vehicle movements (35 two-way trips) per day. This is below the threshold that would normally trigger the requirement for a quantitative air quality impact assessment, based on the non-statutory Guidance published by the Institute of Air Quality Management (IAQM).

The generators and drill rigs are on site in combination is for approximately eight months and therefore has limited potential to affect long-term Air Quality Objectives and Statutory Limit Values. The operation is located in a rural area with low background levels of pollution. The exhaust emissions are hot and will be released from vertical pointing vents with good thermal and mechanical buoyancy which aids dispersion.

No operational emissions of methane or gas flaring are proposed.

Air quality impacts from the project are considered to be of negligible significance.

Woodsetts – Access route

