

Sheephouse Wood Minewater Treatment

Planning Application Supporting Statement

November 2010
The Coal Authority

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Mott MacDonald

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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
01	November 2010	J Bagnall	P Charlesworth	P Charlesworth	For issue

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1. Introduction

The recent history of the Barnsley area has been closely entwined with the mining industry. Following the decline and closure of the pits both the socio-economic and environmental impacts have left a lasting legacy. This scheme is required to address the environmental impact of Minewater pollution associated with the former Colliery workings beneath the site.

Currently minewater discharges from two sources near Midhopestones, leading to contamination of two water courses. The main discharge is into Spring Wood Brook subsequently feeding into the Little Don River and then Underbank Reservoir.

This application pertains to the construction of a minewater treatment scheme to address this issue.

Additionally a catastrophic blow out occurred via the drainage adit in February 2002 damaging a section of the A616. A lengthy closure of this important trunk road was necessary whilst the road was re-built. A stopping was placed in the adit to minimise the risk of further failure.

Since this time the water level has built up behind an underground blockage creating the main discharge highlighted above. One of the benefits of the scheme is that the pumping will reduce the head of water behind the adit stopping (currently 20m) and minimise the chance of any future blow out related to the minewater levels.

2. Proposal

2.1 Site Description

The scheme is located on approximately 2.5 hectares of sloping grazing land to the west of the village of Midhopestones. Woodland forms the southern and western boundaries, with stone walls / wire fences enclosing the remaining boundaries. Overhead transmission cables are present near the site running approximately 100m to the north of the site. Another set of low voltage overhead cables are present across the southern part of the site. The adjacent water course of Spring Wood Brook lies to the west of the site.

2.2 Proposal

To be read in conjunction with drawings MMD_257162_C_DR_XX_102 & 103, see Appendix A.

The scheme is designed to remediate the existing discharge into Spring Wood Brook. The process is designed to remove iron from the minewater before discharging this back into the brook. A combination of aeration and retention is used to allow the iron within the minewater to form large particles which subsequently settle out of suspension in the lagoons. The final stage of treatment is to pass the flow through a wetland plant with reeds, which further reduce the chemical content of the discharge.

The chemistry of the minewater has been monitored for the past 10 years. During this period the characteristics of the minewater has been known to change. The effect of this change is that the acidity of the water can increase. This will have a serious effect on the efficiency of the process detailed above. As a result this application includes for an option to be added at a future date for an additional settlement lagoon between the Headworks and Lagoon 1 (this is shown dashed on drawing 102). This extra Lagoon would be used to introduce alkalinity into the minewater and reduce the acidity.

2.2.1 Access

The scheme will be accessed via the existing track to Hand Bank Farm. The new access will start prior to the farm buildings and will run around the northern boundary of the farm before crossing pastureland into the main site area. The track will be constructed using Type 1 stone laid on geotextile, finished with a 20mm to dust topping. Gates and cattle grids will be provided as shown on the planning drawings.

Due to the permeable construction no surface drainage will be provided to the track, as rainfall will either run through the construction or onto the grassed margins. However, filter drains will be added across the pastureland to control sub-surface flows.

Access within the treatment site fencing is via stone tracks. These have only been provided where absolutely necessary for routine maintenance.

Passing points are provided, see Section 4.8.

2.2.2 Headworks

The headworks are located to the northern end of the site and are accessed via a 4m wide stone track. A turning head is provided to allow service vehicles to safely manoeuvre.

A submersible pump will be suspended 35m into the existing borehole (423194mE, 400328mN) and will be used to pump from the redundant mine workings into the head of the system. A flow of 15 litres per second will be abstracted. The controls and electrical metering equipment will be located in a GRP kiosk (approximate dimensions 4000mm x 3000 x 2300m high - a photo of a typical headworks arrangement is included in Appendix E). The pump will be suspended off a support frame, an indicative arrangement is shown on drawing MMD_257162_C_DR_XX_1401, within Appendix A.

The Minewater is pumped from the borehole into the top of the aeration cascade, where the minewater is oxygenated prior to transfer to the settlement lagoon. The cascade is constructed out of pre-cast concrete segments. To minimise visual impact the cascade is set into the ground and earth bunded to the sides, timber fencing is provided around all sides. The cascade is accessed via stone paths / steps.

From the primary aeration cascade the minewater will be transferred into the settlement lagoon via a transfer channel cut into the slope (a photograph of a channel is included within Appendix D). This will be stepped along its length to provide additional aeration and increase retention times.

The scheme will be fitted with a telemetry system this will allow off-site monitoring and automatically issue alarms in the event of a system failure, allowing the pumps to be stopped remotely. The controls will also automatically shut down the pumps in the event of a failure.

2.2.3 Settlement Lagoons

Minewater discharges from the transfer channel into the first settlement lagoon, where it is retained for approximately 24 hours before being channelled to the second lagoon and again held for a day. Between the two lagoons a second aeration cascade is built into the embankment to provide further aeration.

The lagoons are identical in size (57m x 29m x 3.8m deep) and will each hold 3000m^3 of minewater. The lagoons will be formed from earthwork embankments designed to utilise the material on site and avoid the need to import or export large quantities of earth. Each of the lagoons is lined with a high strength plastic membrane to prevent any leakage. The earthwork embankments will be allowed to natural re-grass from the seed bank with the topsoil. Where possible all slopes are kept to a gradient less than 1 in 3 for ease of maintenance.

Flow into and out of the lagoons is controlled via pre-cast concrete weir units at either end. Pipework is also provided to drain the sludge that accumulates in the base of the lagoons into the drying bed.

The lagoons are intended to operate in series. Annually one of the lagoons will be turned off and drained down to allow the sludge to be transferred to the drying bed. Whilst this is being carried out bypass pipework will be used to maintain the flow through the system.

2.2.4 Drying Bed

Sludge from the settlement lagoons is drained into the drying bed where it is left for several months to allow the excess water to drain out. The surplus water is collected in a network of drains underneath the drying bed and is then emptied into the Reedbed.

Once the sludge is suitably dry this is removed from the drying bed using a mechanical excavator, and taken for disposal.

The drying bed is formed from earth embankments (approximate size 50 x 23 x 1.5m deep). Within the base a network of pipes will collect the water within the sludge and discharge this into the reedbed.

The drying bed is located at a lower level than the lagoons to allow the system to fully operate under gravity. A ramped access is provided between the two levels.

A stone access is provided all the way around to allow access for excavators and tipper lorries during the annual de-sludging process.

2.2.5 Reedbed

Like the other principal features detailed above the reedbed will also be formed in earthworks and will be allowed to grass, to take on the visual appearance of the surrounding pastureland. The reedbed will be lined with a plastic membrane and in-filled with 300mm of topsoil to act as a growing medium for the reeds. The water level in the reedbed is maintained at 300mm. As per the settlement lagoons, the water level is controlled via pre-cast concrete weirs located at both ends of the reedbed.

2.2.6 Outlet

From the outlet of the reedbed the Minewater will be piped to a precast concrete headwall discharging into Spring Wood Brook.

2.2.7 Landscaping and Boundary Treatment

Where possible the existing dry-stone walls around the boundary of the site will be retained. A line of semi-collapsed wall will be removed from across the southern part of the treatment site.

The entire site area will be enclosed with a 2.1m high wire mesh fence supported off timber posts. This will be erected for the site works and retained for the permanent site. Due to the low visual impact, this type of fencing has been used on other minewater schemes and is in keeping with rural nature of the surrounding area. A 4 metre wide gate will be installed at the entrance to the treatment area and a personnel gate will be provided to allow access to the discharge point in Spring Wood.

Additional fencing will be provided within the site area to address health and safety issues. These will be either timber post and rail or post and wire fences.

To reduce the slope gradient between the first lagoon and the drying bed a gabion retaining wall will be constructed to the southeast corner of Lagoon 1. This will be between 2 and 3 metres high.

Landscaping proposals are described in further detail within the Ecology Report in Appendix B. In brief these will consist of:

- Planting native trees and shrubs to eastern and southern boundaries of the site. Felled trees will be replaced at a ratio of 3:1.
- Re-colonisation of site area with native grass species.

2.2.8 Services

Overhead electrical lines (low voltage) run across the lower portion of the site, supplying Hand Bank Farm. These are scheduled to be taken down and diverted underground prior to the scheme commencing. The supply to the site will be installed as part of this work.

No foul drainage is provided as part of the scheme as there are no welfare facilities on site.

No permanent water or BT service is required for the scheme.

2.3 Alternative Sites

Prior to submitting the planning application the Coal Authority has considered a number of potential sites located around the existing discharge.

Sites were considered to the south of the site, along the valley of the Little Don River. The chosen site has the following benefits over the other sites considered:

- Proximity to pumping borehole.
- Site is outside flood plain of the Little Don.
- No new access required onto the A616, and potential disturbance.
- Lower visual impact.
- Better ground conditions – poor drift deposits and perched water within river plain.
- No need to remove large quantities of spoil from site.
- Site is in close proximity to the source of the pollution.

2.4 Access Statement

The facility can only ever be operated by able bodied personnel, due to the necessity to access the plant area for maintenance and operation. This will not be possible by anybody except able bodied members of staff, due to the physical nature of the work involved (substantial manual operator input eg removing pipework - lifting pipework / undoing bolt assemblies). Likewise the work could not safely be carried out by ambulant disabled personnel (eg impaired vision) due to the health and safety risks that are present. It would therefore be practically impossible to design the facility to allow the necessary tasks to be safely carried out by disabled personnel.

Unplanned visits to the site would not be anticipated, visits to the site are pre-arranged. Visitors to site shall accompanied by an operator. There is no access to the site for the general public.

3. Planning Policies & Regulatory Compliance

3.1 Planning Policies

3.1.1 National Policies

Planning Policy Statements (PPSs) along with some older Planning Policy Guidance Notes (PPGs) currently set out the Governments policy framework for planning future development and use of land.

3.1.1.1 Planning Policy Statement 9 – Biodiversity and Geological Conservation

PPS 9 addresses biodiversity and geological conservation issues in relation to planning policy. This document has several facets, of relevance to this scheme are:

- *protection of protected and important habitats and species; and*
- *the opportunity for developments to build in beneficial bio-diversity or geological features.*

In answer to PPS9 we are including the following mitigation measures, compensations and enhancements, without detrimentally affecting the 'visual openness' of the site:

- Replacement of habitats lost and improvements to habitats so that they become suitable for badgers and reptiles and which would connect into the existing habitats;
- Installation of small gaps into any security perimeter fencing, if used, to allow the badgers access to forage in the treatment works;
- Erection of three bat and five bird boxes in retained mature trees; and
- Use of native plant species in the landscape design, including the use of plant species which will act as food plants for terrestrial invertebrates and badgers.

This is discussed in greater detail in the Ecology Report within Appendix B.

3.1.1.2 Planning Policy Statement 23 – Planning and Pollution Control

PPS 23 addresses planning policy with specific regard to the control of pollution.

Appendix A of PPS23 states that the environmental benefits that the development might bring should be a material consideration in making decisions on individual planning applications, including;

- *restoration of former habitats;*
- *enhancement or creation of habitats; and*
- *the remediation of past contamination.*

A primary aim of the works is to remediate contamination caused as an indirect result of historic mining in the area by reducing or eliminating the source of the contamination, untreated minewater issuing into the Spring Wood Brook and Little Don River. The reduction or removal of the source contaminants will allow the restoration of the former habitat and plans for the works directly, as described in Section 2 above, will enhance the existing and create other sympathetic habitats within the site.

Appendix A also states that;

- *the possible adverse impacts on water quality and the impact of any possible discharge of effluent or leachates which may pose a threat to surface or underground water resources directly or indirectly through surrounding soils; and*
- *the need to make suitable provision for the drainage of surface water*

should be considered.

Should the current underground minewater levels remain untreated there is a possibility that minewater and associated contaminants will continue to discharge into Underbank Reservoir to the south east of the site. The proposed works would minimise such contamination occurring.

It is proposed that the site will be formed from permeable material, either grassed embankments or stone tracks, and as such the surface water run-off from the site will be no different from the natural drainage occurring on site at present.

3.1.2 Barnsley MBC Unitary Development Plan

The current statutory development plan for the area regulated by Barnsley MBC is the Unitary Development Plan (UDP) adopted in December 2000.

Within the plan there is no specific reference to the remediation of Minewater discharges from existing operational sites, or as a result of previous mining activity. However, the UDP sets out to meet the high level objectives set down by central government. Of these the following are relevant to this application:

- protecting and enhancing high quality environments and wildlife habitats, and improving poor environments; and
- minimising pollution of land, air and water and reduction of the impact of waste disposal.

3.1.2.1 Water Pollution Policy ES3

'The council will, in conjunction with the Environment Agency, use all it's available powers to and influence to prevent the pollution of all surface and underground water and seek to improve their quality consistent with European Union water quality objectives'.

This is the very essence of what the scheme is designed to achieve. The project is part of a larger and ongoing strategy to remediate Minewater discharges in compliance with the Water Framework Directive, see Section 3.2

3.1.2.2 Greenbelt UDP Policy GS7 / PPG2

'Without prejudice and subject to the application of policies GS8, GS8A, GS8C, GS8D, GS8E and GS9 in the UDP, development within the green belt will not be permitted unless it maintains the openness of, and does not conflict with the purposes of including land in the green belt'.

This policy also makes reference to Planning Policy Guidelines 2 : Green Belts (PPG2).

The proposed site lies within land designated as Green Belt. However, we consider that the development as proposed complies with the requirements of Clause 3.12 of PPG2 in so far as the development maintains the openness of the Green Belt, and does not conflict with the purpose of including land in the Green Belt.

3.1.2.3 Visual Amenity Policy GS9

'Development within the Green Belt, or conspicuous from it should not by reason of its siting, materials or design result in significant harm to the visual amenity of the green belt'.

The proposed site is within an area designated as having Borough Landscape Value (WR12).

The visual sensitivity and value of the site have been careful considered as part of the scheme development. The majority of the scheme has been located in a natural dip to make maximum use of the screening offered by the woodlands and topography. The scheme is formed primarily from grassed embankments, which will have a similar visual appearance to the sloping arable land found on site.

Minimal landscaping has been included to reflect what is currently on site. A small number of appropriate trees and shrubs are being provided, as an enhancement.

See the 3D terrain model within Appendix C.

3.1.2.4 Protecting Habitats and Species GS15

'The Council will seek to safeguard important habitats and species from any activities which would cause disturbance, pollution or other damage. All development proposals should, where appropriate, include measures to conserve and enhance existing features of nature conservation interest and to create new nature conservation areas.'

Spring Wood is identified in the Barnsley MBC UDP Volume 13 – Western Rural Community Area as being a Natural Heritage Site and a potential Local Nature Reserve (WR13/11 and WR 13/30). Whilst the site is not within Spring Wood itself, the scheme will enhance the important habitats which exist in the locality of the site by reduction in the current level of water pollution and introducing new habitats as a direct result of the scheme. Section 4 of this document and the Ecology report contained in Appendix B provides further details.

3.2 Regulatory Compliance

3.2.1 Water Framework Directive 2000/60/EC

The Water Framework Directive establishes a framework for protecting the water environment, with the aim of achieving demanding chemical and ecological water quality targets by 2015. It is the aim of the scheme to significantly reduce the chemical contaminants entering the Spring Wood Brook and subsequently the Little Don River, as a result of the current minewater discharges and as a result the biological degradation currently experienced.

The discharge has been identified by the Environment Agency as requiring remediation, currently number 17 on the priority list. The Agency are therefore supportive of the scheme and have been consulted during the schemes development.

4. Environment, Ecology & Heritage

4.1 Ecology

4.1.1 Outline

This is addressed in detail within the Ecology Report included within Appendix B, the following is a summary of the findings of the report.

The proposed Minewater Treatment Scheme (MwTS) site is a species-poor semi-improved grassland field bordered by woodland, mature trees and dry stone walls. There are three Sites of Special Scientific Interest (SSSI) within 2 km, the closest of which lies immediately across Spring Wood Brook. These designated sites would not be impacted by the proposed MwTS development.

An Extended Phase 1 Ecological Assessment carried out in May 2009 identified potential for **bats, badgers, breeding birds and of reptiles** to be present on site. The need for further Phase 2 surveys for bats and badgers was highlighted and a report presenting the findings of those Phase 2 surveys of trees for bat roost potential and monitoring of an annex badger sett adjacent to the proposed site was produced. This report will be submitted in support of the planning application for the scheme.

4.1.2 Implications and Recommendations

Badgers

- The annex badger sett adjacent to the works site showed evidence of activity as did the main sett approximately 100m from the works. There are also disused mine workings beneath the proposed scheme footprint which may connect with the badger tunnels of the annex sett.
- Due to the risk of damaging the badgers' annex sett during the construction works and the potential to cause collapse and trap individuals inside, a **Natural England licence will be required to close the sett following an exclusion exercise.** Permanent exclusion would take place between July and November to avoid disruption to badger breeding.

Bats

- Trees currently affected by the scheme are of low/moderate bat roost suitability. As such these trees need to be checked by a licensed bat worker and an endoscope prior to felling. Tree pruning will also need to be carried out under the direction of an ecologist.
- Any construction and operational lighting would be in accordance with Bat Conservation Trust Guidance.
- One tree adjacent to the working area has a high potential to support roosting bats. This will be protected from construction activities.
- Three bat boxes would be erected in retained mature trees.

Reptiles

- There is a low risk of encountering reptiles on site due to the lack of suitable habitat. However, the dry stone walls provide limited habitat potential and as a precaution would be hand cleared with a watching brief.
- If walls have to be removed as part of the works, a stone pile would be re-established on the site edge, to mitigate for the loss of the stone wall and act as a place to put any individuals that are found.

Breeding Birds

- The site is currently grazed by cattle so offers little vegetation, this will continue until commencement of the works to minimise the risk of nesting. However, the site will be checked for evidence of nesting by an Ecologist immediately before the works commence. If any are found an exclusion zone of not less than 3m will be established and the nests left undisturbed until the chicks have fledged.

Habitats

- There will be the loss of 1.6 Ha of species-poor semi-improved grassland and individual trees. However, the operational minewater treatment facility will create new areas of open water and reedbeds both of which are UK and Barnsley Biodiversity Action Plan habitats.

4.2 Geology

The site is underlain by Lower Coal Measures Formation of Carboniferous (Westphalian B) age, this dips to the north with a fault trending south-west - north-east across the bottom corner of the site. Three coal seams are shown as present. They generally run on a line from north-west to south-east. The seams are the Hard Bed (Gastrioceras listeri), Middle Band (known as Middle Bed in Yorkshire 281 NE 1931 Geological Map) and Soft Bed coals, these are discussed in detail in the Mining Report within Appendix C.

The solid geology is highly weathered as it approaches the surface and is overlain by a band of clay (≈0.6m) and topsoil (0.1-0.3).

4.3 Mining

The site has a history of mineral abstraction. This is reviewed in detail within the Mining Report included within Appendix C.

A number of features were identified that impact on the scheme, these and the measures to address them are detailed below:

- Outcrop of Halifax Hard Seam – This runs east to west cross the centre of the site. The seam is known to have been worked at depth and is likely to have shallow workings. It is proposed that this section of the site will be over-dug down to the seam and re-compacted to ensure that there are no voids associated with shallow workings below the lagoon structure. Exploratory holes have been carried out as part of the recent ground investigation to confirm the position of the seam.
- Old pit – This is located in a fenced area in the north east corner of the site. No works are being undertaken around this feature.
- Drainage adit – This runs north – south from the pumping borehole before emerging in the bank to the North of A616. It is from this adit that the smaller discharge emerges. Limited works are being carried out above the adit (stone access roads), the adit is also at depth +20m through solid geology below the site. As a result this will not impact the works.

A catastrophic blow out occurred via the drainage adit in February 2002. This damaged a section of the A616 and required a lengthy closure of this important trunk road whilst the road was re-built. A stopping was placed in the adit to prevent further failure. Since this time the water levels have built up behind the collapse, leading to the main discharge into Spring Wood Brook.

4.4 Ground Investigation

A ground investigation has been undertaken (October 2010).

As part of this study contamination testing has been undertaken. No issues have been identified with regards to contaminated land.

4.5 Water Quality

The discharge has been identified by the Environment Agency as requiring remediation, currently number 17 on the priority list. The Agency are therefore supportive of the scheme and have been consulted during development of the scheme.

An Environmental Permit application will be submitted to the Environment Agency for the permanent discharge from the scheme into Spring Wood Brook. This cannot be applied for until the Planning Application is submitted.

A Transfer Licence application will also be applied for the borehole abstraction.

4.6 Flood Risk Assessment

Areas within the river plain are classified as Zone 2 & 3 flood risk areas. However, the proposed scheme is located outside the flood plain of the Little Don River (Porter) and as a result will neither reduce the volume available for flood storage, or be directly affected by river flooding. As a result it will have no impact on the flood risk within the local area.

The discharge from the scheme is expected to be 12-15 litres per second, this is consistent with the combined flow from the two current discharges, as a result the scheme will add no additional flows to the river system. It should be noted that the flows are extremely small in comparison to the flow in the Little Don River.

The site is formed from permeable material either grassed embankments or stone tracks as a result the surface water run-off from the site will be no different from the natural drainage occurring on site at present.

4.7 Heritage

From the historical mapping information currently available the site has been used as pastureland for the last 150 years. Any surface mine workings or industrial usage on the site pre-date the historical Ordnance Survey maps.

The South Yorkshire Archaeological Service has been consulted regarding the scheme.

4.8 Noise and Dust

The site will have limited impact on the general public due to the location. The nearest property is Upper Hand Bank Farm located 100 metres to the east of the main site. The properties at Midhopestones lie over 600 metres away.

4.8.1 Construction Phase

The scheme involves a considerable amount of earthworks and as a result there is the potential for dust to be generated during the site works, particularly during periods of dry weather. If required standard water suppression techniques will be used.

The site works will generate noise from plant movement and excavation, the extent of the impact is unlikely to affect the properties in Midhopestones. Work on site will be restricted to normal working hours.

4.8.2 Operational Phase

During normal operation the scheme will have minimal impact on air quality. The Authority has over numerous schemes in operation with no issues associated with odour or dust emissions.

The only source of noise will be the borehole pump which will be virtually inaudible when in use as it will be approximately 35 metres underground.

4.9 Traffic Management Plan

4.9.1 General Design

All access to the site is via Mortimer Road and along the farm access.

The site location is accessed from the A616, this is a main trunk road that is managed and maintained by the Highway's Agency. This route is a good quality single carriageway road that has a 40mph speed limit on the approach to the Midhopestones Crossroad, the junction of the A616 and Mortimer Road, and speed cameras are present at this location. The geometry of the A616 is relatively straight and flat.

A short section of Mortimer Road, north from the cross roads at Midhopestones, is used to access the private farm track to Hand Bank Farm. Mortimer Road passes under a stone bridge, which will restrict the type/height of vehicles that could be used on site to 4.2m. The traffic volumes on Mortimer Road are very low.

The farm access track is unmetalled and narrow (single track). Either side of the track is heavily vegetated and in places steeply sloping. As a result there is no scope for increasing the width of the track. The condition of the track is variable and will require some works to repair potholes in the stone prior to construction. Given the extent and size of vehicles that are using the track repair work will be an ongoing task throughout the construction period. The only property that is accessed via the track is Upper Hand Bank Farm.

Under normal circumstances the track is adequate for the routine site visits, given the very low volume of farm traffic. During the site phase the volume of traffic will require specific works / procedures to manage the traffic, notably:

- Traffic management – lights will be provided on the access track to ensure that vehicles do not need to pass.
- Provision of 2 passing places, 1 of these is positioned at the traffic control point to allow vehicles to be held waiting control to proceed.
- Delivery instructions – to be developed by the Contractor.

4.9.2 Traffic Movements

4.9.2.1 Operational

The site will be visited 2-3 times per week by maintenance staff in a van (Ford Transit Connect or similar sized) to carry out routine maintenance and testing.

The operatives are responsible for a number of sites in the area, and need to carry a significant amount of equipments and tools. It is therefore not possible for the visits to be made using public transport. These visit are essential and cannot be avoided.

Periodically it will be necessary to service the pumps and electrical equipment. This may require a small mobile crane and small flat bed delivery lorries.

Under normal circumstances all visits to site will be during normal working hours. However, in the case of an emergency call out the maintenance staff may need to attend site at any time.

4.9.2.2 De-sludging

Once the site is operational a de-sludging operation will be undertaken every year. This will involve removing the sludge accumulated in the drying bed and disposing of the sludge off-site. This operation will involve excavating dried sludge from the drying bed using a mechanical excavator and removing from site using tipper wagons.

A number of steps have been taken to reduce the impact of this operation.

- A drying bed has been added. The purpose of this is to take the sludge from the Lagoons and allow this to naturally de-water and dry out. The impact of this is that the volume of sludge can be decreased by a factor of up to 10. This dramatically reduces the number of vehicles required to remove the sludge from site (estimated annual sludge production is circa 1300m^3 at 4% dry solids this equates to 87 tanker trips. Dried sludge at 40% dry solids is 130m^3 equating to 10 tipper wagon movements).

It is likely that a single de-sludging event would be carried out over approximately two consecutive days taking place during normal working hours.

4.9.3 Traffic Movements (Construction)

Considerable efforts have been made to reduce the number of vehicle movements to site, primarily from a practical point of view, the site access is narrow and steep but also to reduce the impact to local residents and the broader environment. Specific measures to reduce movements are as follows:

- Earthworks modelled to achieve cut / fill balance on site eliminating the need to import or dispose of material from site. The earthworks volume is 15,000m^3. If 10% of this had to be brought to site this would equate to 1,500m^3 or 185 lorries.
- Use of pre-cast concrete elements reduces the quantity of wet concrete needed to be delivered (large quantity of fresh concrete volume is water which is lost as the concrete dries).
- Use of open ditches for transferring minewater to the lagoons. This reduces the quantities of pipework and pipe bedding needed.

- *Fencing – the construction phase fencing* will be retained for the permanent scheme. This will eliminate the need for a second delivery of fencing and disposal of the construction fencing.
- Access roads these have been reduced by 1400m^2 (420m^3) and replaced by grassed areas, this will be a reduction of 53 lorry movements.
- Re-use of site won topsoil for the reedbed saves 432m^3 of imported material, 54 lorry movements.

Of the remaining elements the largest volume of material will be the stone for the access road (25 lorries = 1000m^3).

Appendices

Appendix A. Scheme Drawings 3
Appendix B. Ecology Report 5
Appendix C. Mining Report 7
Appendix D. Photographs 9

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Appendix A. Scheme Drawings

Drawing Reference	Title
MMD-257162-SHF-PLA-100	Site Location Plan.
MMD-257162-SHF-PLA-101	Site Layout Sheet 1 of 2
MMD-257162-SHF-PLA-102	Site Layout Sheet 2 of 2
MMD-257162-SHF-PLA-103	Elevation from the West
MMD-257162-SHF-PLA-104	Elevation from the South
MMD-257162-SHF-PLA-105	Pumping Area layout

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400500mN
400400mN
400300mN
400200mN
400100mN
400000mN
399900mN
399800mN
399700mN
399600mN
399500mN

422800mE
422700mE
422800mE
422900mE
423000mE
423100mE
423200mE
423300mE
423400mE
423500mE
423600mE
423700mE
423800mE
423900mE

Spring Wood Brook
A616
To Langsett
Hand Bank Plantation
Hand Bank Farm
A616
To Penistone
Mortimer Road
A616
River 'Little' Don
MIDHOPESTONES
To Stocksbridge
Underbank Reservoir

1:2000 0 100m 200m

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gre23123

Notes

1. All dimensions are in millimetres unless noted otherwise.
2. All levels in metres above OS Datum unless noted otherwise.
3. Dimensions must not be scaled from this drawing.

Key to symbols

Existing farm access.

Extent of mine workings (indicative).



Location Plan
Scale N.T.S

Reference drawings

MMD-257162-SHF-PLA-101	-	*Site Layout (Sheet 1).*
MMD-257162-SHF-PLA-102	-	Site Layout (Sheet 2).
MMD-257162-SHF-PLA-103	-	Elevation through Settlement Ponds (West).
MMD-257162-SHF-PLA-104	-	Elevation through Settlement Ponds (South).
MMD-257162-SHF-PLA-105	-	Pumping Area Layout.

Coal Authority mine record plan ref: GCR280.

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	12/11/2010	SAG	For Planning	JAB	PJC

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ENVISION

Title

Sheephouse Wood MwTS
Site Location Plan

Designed	J Bagnall	JAB	Eng check	B Penny	BAP
Drawn	R J Payne	RJP	Coordination	J Bagnall	JAB
Dwg check	B Penny	BAP	Approved	P Charlesw'h	PJC

Scale at A1: 1:2000
Status: PRE
Rev: P1

Drawing Number
MMD-257162-SHF-PLA-100



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mar09pfd

Notes

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2. All levels in metres above OS Datum unless noted otherwise.
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Key to symbols

- Extent of mine workings (indicative).
- Proposed Stone track.
- Existing farm access.
- Grassed access track.
- Trees
- Shrubs
- Overhead power line.
- Distribution chamber.
- Vehicle barrier post.
- Open mesh fencing 2.1m high.
- Buried pipework.
- Existing trees.

Reference drawings

MMD-257162-SHF-PLA-100	Site Location Plan.
MMD-257162-SHF-PLA-102	Site Layout (Sheet 2).
MMD-257162-SHF-PLA-103	Elevation through Settlement Ponds (West).
MMD-257162-SHF-PLA-104	Elevation through Settlement Ponds (South).
MMD-257162-SHF-PLA-105	Pumping Area Layout.

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	18/11/2010	AM	Minor Updates	JAB	PJC
P1	12/11/2010	SAG	For Planning	JAB	PJC

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Title

Sheephouse Wood MwTS
Site Layout
Sheet 1 of 2

Designed	J Bagnall	JAB	Eng check	B Penny	BAP
Drawn	A Marsden	AM	Coordination	J Bagnall	JAB
Dwg check	B Penny	BAP	Approved	P Charlesw'h	PJC

Scale at A1: 1:500
Status: PRE
Rev: P2

Drawing Number: MMD-257162-SHF-PLA-101

Passing point.

Proposed field gates.

Field gates.

Proposed cattle gates.

Proposed cattle gates.

400100mN

400000mN

Passing point, will require field gate and wall relocating.

423300mE

423400mE

423500mE

1:500 0 25m 50m

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Notes

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Key to symbols

- Proposed Stone track.
- Existing farm access.
- Grassed access track.
- Trees
- Shrubs
- Overhead power line.
- Distribution chamber.
- Vehicle barrier post.
- Open mesh fencing 2.1m high.

Reference drawings

- MMD-257162-SHF-PLA-100 - Site Location Plan.
- MMD-257162-SHF-PLA-101 - Site Layout (Sheet 1).
- MMD-257162-SHF-PLA-103 - Elevation through Settlement Ponds (West).
- MMD-257162-SHF-PLA-104 - Elevation through Settlement Ponds (South).
- MMD-257162-SHF-PLA-105 - Pumping Area Layout.

Coal Authority mine record plan ref: GCR280.

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	12/11/2010	SAG	For Planning	JAB	PJC

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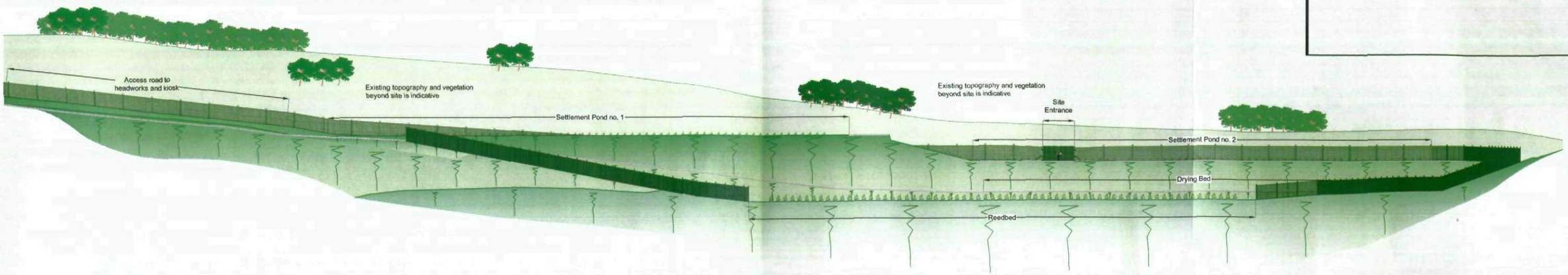
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Sheephouse Wood MwTS
Site Layout
Sheet 2 of 2

Designed	J Bagnall	JAB	Eng check	B Penny	BAP
Drawn			Coordination	J Bagnall	JAB
Dwg check	B Penny	BAP	Approved	P Charlesw'h	PJC
Scale at A1	1:500	Status	PRE	Rev	P1

Drawing Number

MMD-257162-SHF-PLA-102

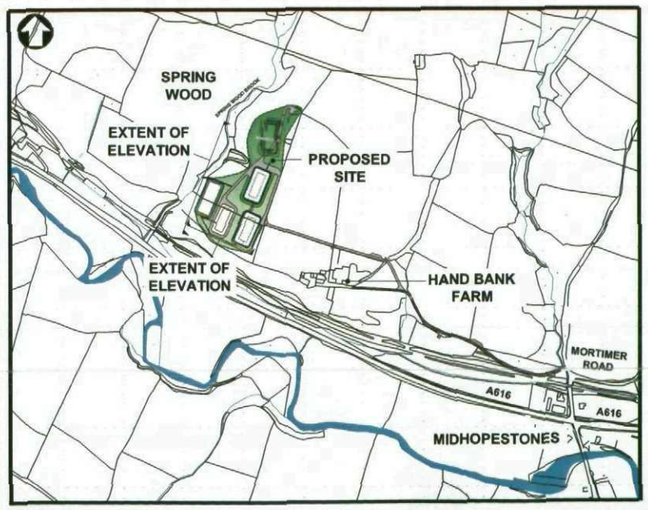


Notes

1. All dimensions are in millimetres.
2. All levels are in metres.
3. Do not scale dimensions from this drawing.

Reference drawings

MMD-257162-SHF-PLA-100	-	Site Location Plan.
MMD-257162-SHF-PLA-101	-	Site Layout (Sheet 1).
MMD-257162-SHF-PLA-102	-	Site Layout (Sheet 2).
MMD-257162-SHF-PLA-104	-	Elevation through Settlement Ponds (South).
MMD-257162-SHF-PLA-105	-	Pumping Area Layout.



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1:250 0 12.5m 25m

1:5000 0 250m 500m

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Title

Sheephouse Wood MwTS
Elevation through Settlement Ponds
Looking from the West

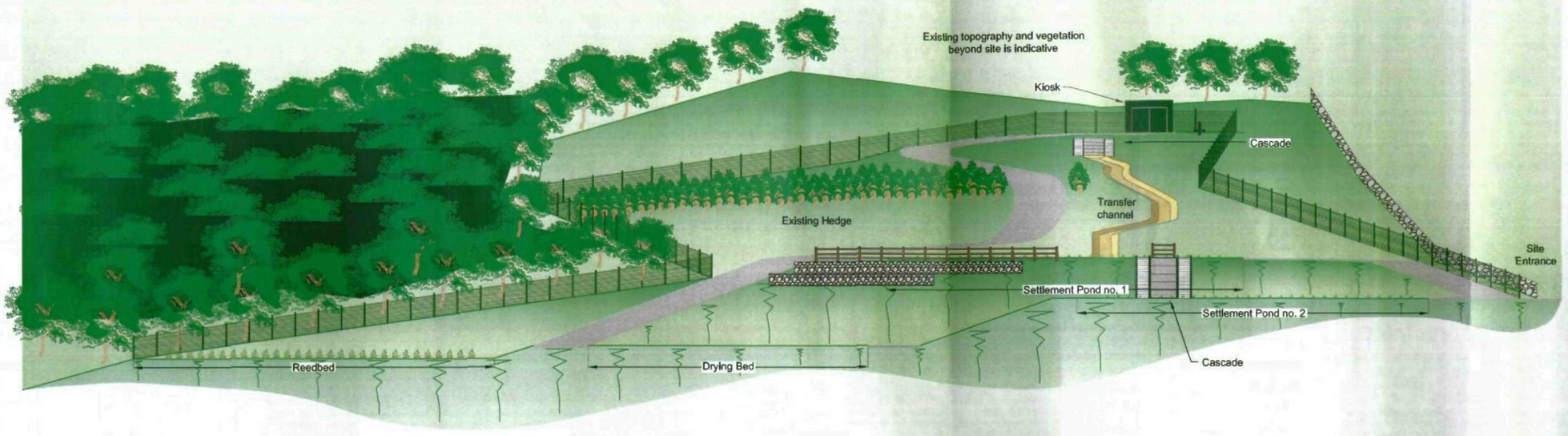
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Drawn	G Broughton	GB	Coordination	J Bagnall	JAB
Dwg check	J Bagnall	JAB	Approved	P Charlesworth	PJC

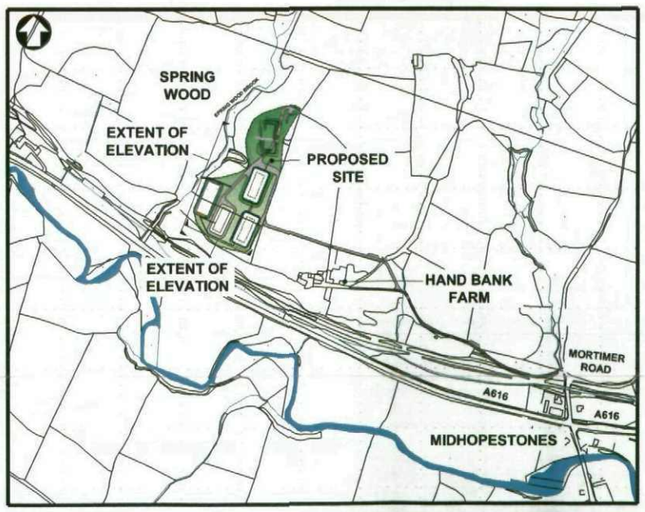
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Status: PRE

Rev: P1

Drawing Number: MMD-257162-SHF-PLA-103





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1:200 0 10m 20m

1:5000 0 250m 500m

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Reference drawings

MMD-257162-SHF-PLA-100	- Site Location Plan.
MMD-257162-SHF-PLA-101	- Site Layout (Sheet 1).
MMD-257162-SHF-PLA-102	- Site Layout (Sheet 2).
MMD-257162-SHF-PLA-103	- Elevation through Settlement Ponds (West).
MMD-257162-SHF-PLA-105	- Pumping Area Layout.

Rev	Date	Drawn	Description	Ch'k'd	App'd
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Title

Sheephouse Wood MwTS
Elevation through Settlement Ponds Looking from the South

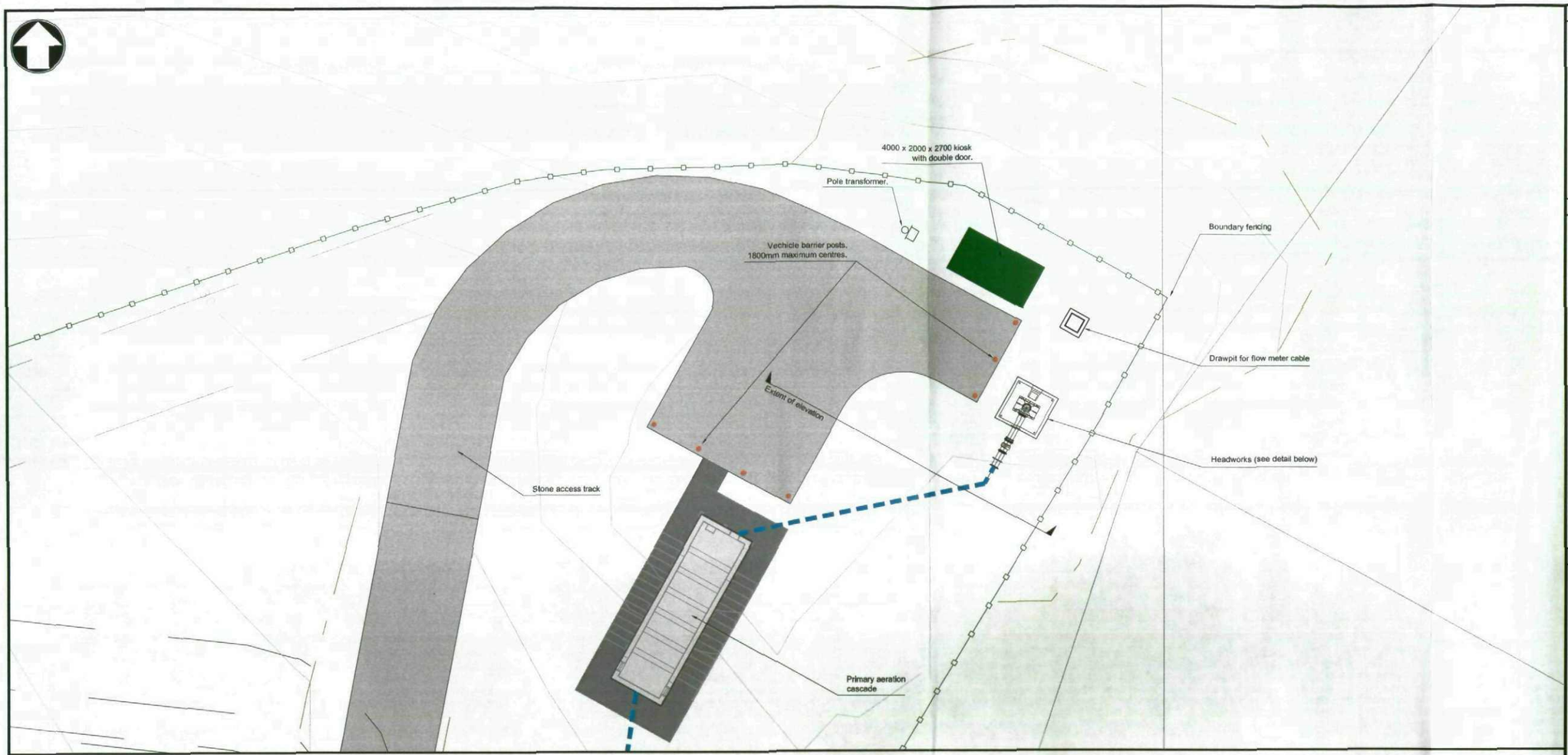
Designed	J Bagnall	JAB	Eng check	B Penny	BAP
Drawn	G Broughton	GB	Coordination	J Bagnall	JAB
Dwg check	J Bagnall	JAB	Approved	P Charlesworth	PJC

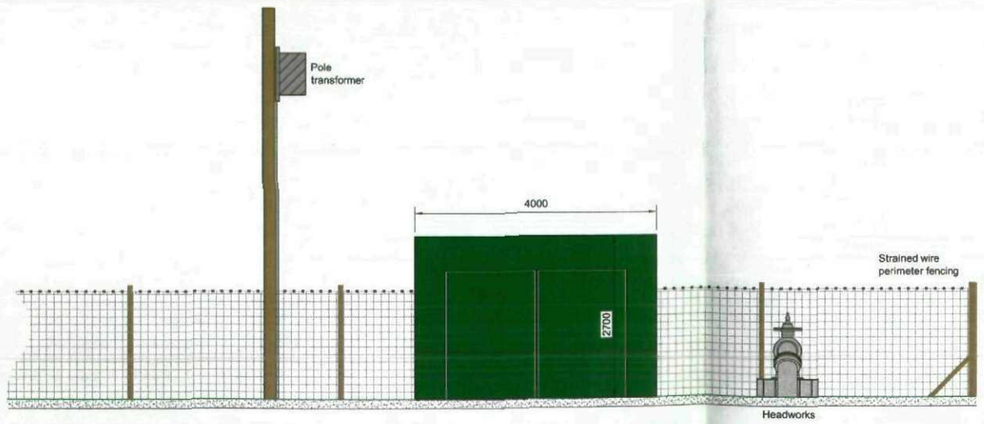
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1:200 Elevation, 1:5000 Plan

Status: PRE

Rev: P1

Drawing Number
MMD-257162-SHF-PLA-104





Notes

1. All dimensions are in millimetres.
2. All levels are in metres.
3. Do not scale dimensions from this drawing.

Key to symbols

- Vehicle Barrier Posts
- Buried Pipework

Reference drawings

MMD-257162-SHF-PLA-100	-	Site Location Plan.
MMD-257162-SHF-PLA-101	-	Site Layout (Sheet 1).
MMD-257162-SHF-PLA-102	-	Site Layout (Sheet 2).
MMD-257162-SHF-PLA-103	-	Elevation through Settlement Ponds (West).
MMD-257162-SHF-PLA-104	-	Elevation through Settlement Ponds (South).

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	12/11/2010	GB	For Planning	JAB	PJC

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Title

Sheephouse Wood MwTS Pumping Area Layout

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Drawn	G Broughton	GB	Coordination	J Bagnall	JAB
Dwg check	J Bagnall	JAB	Approved	P Charlesworth	PJC

Scale at A1
1:100 Plan, 1:50 Elevation

Status
PRE

Rev
P1

Drawing Number
MMD-257162-SHF-PLA-105

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1:100 0 5m 10m

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