

# **NORTH YORKSHIRE POLYHALITE PROJECT – WOODSMITH MINE**

## **OPERATION OF THE SLURRY PLANT**

Bauer: YPM-BAU-MS-03

AMC UK: 40-AMC-WS-10-SW-RA-0005

Revision	Date	Description	Made by	Checked	Signed
A	17.03.17	Original Issue	G. Jahnert	N. Thomas	
B	19.05.17	<i>Incorporated AMC UK comments</i>	<i>A. Khan</i>	<i>G. Jahnert</i>	
C	25.05.17	<i>Incorporated AMC UK comments</i>	<i>A. Khan</i>	<i>G. Jahnert</i>	



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Contract Title: NORTH YORKSHIRE POLYHALITE  
PROJECT – WOODSMITH MINE

Made By:  
AK

Checked by:  
JAG

Work Scope: Operation of slurry plant

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## **1. SCOPE OF WORKS**

This method statement describes mobilisation, operation and demobilisation of the support slurry plant. A support slurry based on bentonite will be used for the construction of the Woodsmith Mine diaphragm wall shafts. The support slurry stabilises the open trench during panel excavation, provides a transport medium for spoil produced at the cutter wheels and creates a filter cake on porous soil and rock preventing excessive loss of slurry into the surrounding ground. The slurry is mixed and stored at the slurry plant and is pumped to the diaphragm wall locations during excavation. Simultaneously, the cutter unit pumps slurry and muck back to the plant where the muck is separated from the slurry. Muck will be disposed of and the slurry returned to storage tanks. Once slurry is so heavily loaded that it cannot be cleaned anymore, it becomes waste slurry and needs to be disposed of. The site layout and location of slurry plant can be found in Appendix A.

## **2. SIGNIFICANT RISKS AND CONTROLS**

The following key risks have been identified for the diaphragm wall works. Risk mitigations have been planned in line with the full risk assessment for diaphragm wall construction (refer to Appendix B).

### **1) Risk: Slips, trips and falls**

**Controls:** Implement solid housekeeping procedures and maintain walkways. Provide adequate storage facilities for small tools and consumables. Provide waste segregation facilities. Ensure that all operatives wear safety footwear with adequate ankle protection. Clean up spillages on walkways immediately to avoid slippery surfaces. De-ice walkways as required during winter months.

### **2) Risk: Access and egress / falls from height / slips trips and falls**

**Controls:** Appropriate access and egress will be provided. Only approved Bauer personnel to have authorised access to the bentonite plant. The need for working at height will be eliminated as much as practicable. Where working at height cannot be avoided, adequate edge protection will be made available wherever possible. Where use of edge protection is not practicable, alternative access systems will be provided (scaffold, MEWP or similar). As a last resort, fall arrest systems will be used (e.g. safety harness and lanyard).

Pipework and cables to be kept clear of walkways as much as reasonably practicable.

### **3) Risk: Spillages of bentonite or other additives**



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**Controls:** All slurry handling plant i.e. tanks and mixers will be limited to a bunded concrete slab provided by AMC UK. Any spillages will be confined within the slab area and will be cleaned immediately. The slab will be a bunded containment, sloped to the desanding spoils area. Spill kits will be available to keep any spills from spreading within the bunded slab.

Any water collected in the bunded slab will be pumped to the waste bentonite tank. The water will be tankered or re-used if suitable after treatment.

All liquid additives will be stored in sealed bunded containers with clear signage. Any solid/ powder additives will be delivered in bags and stored on pallets within the bunded concrete slab. Please refer to the slurry management plan (YPM-BAU-SMP-BEN) for the list of additives.

#### **4) Risk: Fatigue**

**Controls:** Schedule shift pattern with consideration to fatigue related occupational illness. Review shift pattern with operatives and change working times if required. Ensure that adequate welfare facilities are available.

#### **5) Risk: Lifting operations / wind speed.**

**Controls:** Bauer will produce lift plans for all cranes and HIABs used on site. The personnel in charge of lifting operations will be competent and certified. All plant and lifting equipment will be subject to periodic thorough examination. The bentonite slab will be designed and installed by AMC UK taking into account wind loadings on the slurry tanks.

The slingers will inspect every load prior to lifting. Especially reinforcement cages will be checked for loose items which could drop to the ground during the lifting operation.

Crane operators will lift in line with the applicable lift plans and the manufacturer's instructions. Operators will monitor the wind speed through anemometers and cease lifting operations for wind speeds exceeding 14 m/s (or as per crane manufacturer's instructions).

Crane operators will not lift over personnel. Operatives will use taglines to control loads during lifting operations.

#### **6) Risk: Electrical Shock from the cables and electrical equipment**

**Controls:** An electrical permit to be obtained prior to any electrical work being carried out. All electrical equipment in the bentonite plant to be wired by a qualified electrician. All electrical cables



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and small equipment to have PAT test certs. Any damaged equipment or cables to be put out of use and brought to the attention of management for repairs or taken off site.

Any electric cables in proximity to the desander muck drop off need to be elevated or physically protected against damage by the muck away excavator. Muck away contractor to be briefed on cable locations to prevent cable strikes.

Warning signs have to be displayed in the area defining the minimum safety clearance from buried cables.

### **3. PLANT & EQUIPMENT**

Refer to plant register in Appendix F

A list of slurry plant is included in Appendix F.

Slurry plant will be delivered to site on 20” rigid lorries, 45” articulated lorries and semi low-loaders. The desanding units would require a movement order as it is considered to be abnormal load. Further details regarding the management and movement of vehicles to site can be found in Bauer Logistics Plan (40-AMC-WS-10-LG-PL-0001).

### **4. MOBILISATION OF BENTONITE PLANT**

The dry silos and slurry tanks will be installed into the positions outlined in the site installation drawing. The silos will be lifted in to position and fixed onto the slurry plant slab using mechanical anchors. The tanks will be installed in accordance with the slurry tank installation method statement. The remaining equipment, including pumps, screw conveyors, mixing plants, agitation tanks and de-sanding units will be arranged as per the slurry plant layout drawing.

Slurry plant equipment will then be connected through a series of flexible hoses and rigid pipes. The pipes will be positioned manually. All joints are to be connected and securely fixed using ‘o’ rings to ensure they do not leak. If there is a leak, the joint is to be taken apart and repaired and/or replaced.

Step overs will be constructed over pipes where they pass across walkways. The design of the step over will be dependent upon the location and the size of the pipe. If the step-over is to be permanent a suitable design and material will be used.

Where misinterpretation of the flow direction is possible, pipes will be marked with arrows to indicate the correct flow direction.

Feed and return lines will be laid across the site to reach the diaphragm wall construction areas. The feed/return lines will underpass haul roads through ducting provided by AMC UK.



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An electrician will connect all electric slurry plant items and test the entire electrical system for faults. The power supply is provided by AMC UK who will install distribution panels at the agreed locations. Once the electrical system has been approved, the electrician will issue a certificate to confirm compliance with electrical standards.

## **5. BULK POWDER DELIVERIES**

Bentonite powder will generally be delivered by an articulated bulk tanker and blown into the dry silos using air pressure. Following arrival of a bulk tanker delivering the bentonite powder to site, a slurry plant operative will connect it to the dry powder silo using the appropriate transfer pipes. The dry bentonite powder will then be discharged into the silo using the on-board transfer system provided by the tanker. A sock attached to the connection between pipe and dry silo will contain the powder in case of loose connections or bursts. For the transfer of bulk powder to silos a detailed procedure (Dry Silo Filling Procedure) must be followed. This procedure will provide as minimum information on the following:

- The reporting procedure for the delivery
- The maximum pressure under which the tanker can discharge to the silo
- The maximum flow rate for material allowed
- Procedure for connection to the silo
- Details of the alarm and pressure release measures and when to stop deliveries
- Procedures to follow in the event of an incident / release
- Procedure for venting of residual pressure in the tanker
- Procedure for locking out of the silo
- Reporting procedure at the end of the delivery.

The delivery of any materials to site shall adhere to the site Traffic Management Plan, including the use of agreed transport routes.

## **6. MIXING, STORAGE AND TESTING**

In order to mix support slurry, dry bentonite powder and fresh water shall be combined through a flow mixer. The resulting slurry is temporarily stored in a small agitation tank and then pumped into the main slurry storage tanks as soon as the parameters have been tested and confirmed.



Figure 1: Typical slurry mixing setup

Testing of the slurry will ensure that the mix specification is met. When fresh slurry does not comply with the specification it will be remixed and refined until the specification is fulfilled. Records of testing will be maintained and made available for audit purposes.

Additives will be introduced to the slurry as and when required, in line with manufacturer's guidelines. The additives can influence the bentonite viscosity without affecting the density (e.g. by pH manipulation of re-arrangement of the slurry particle matrix). The site engineer/bentonite plant supervisor will ensure that COSHH sheets for the substances being added are available. A record of used additives will be maintained on the test records.

## 7. DESANDING AND EXCHANGE

During panel excavation, fresh/clean support slurry will be continuously pumped from the storage tanks to the panel location. The cutter operator will regulate the feed flow using a remote controlled feed pump. At the same time, the cutter internal mud pump will pump support slurry and rock/soil cuttings from the cutter wheels back to the slurry plant desanding units. The cutter operator team will regulate the return flow to prevent the risk of overflow of the desanding units.



*Figure 2: Cutter wheels and mud pump*

The desander will segregate muck from the slurry and send cleaned slurry back to the storage tanks or directly back to the trench. After completion of the excavation, the entire panel volume will be desanded (circulated through the desander) until the slurry parameters for concreting are fulfilled. If the slurry is too heavily loaded, the entire panel volume can be exchanged (replaced with fresh slurry) in order to reduce waiting time for the start of reinforcement installation. In this instance, the excavation mud will be cleaned later by circulation between [the](#) storage tanks and desanding unit.



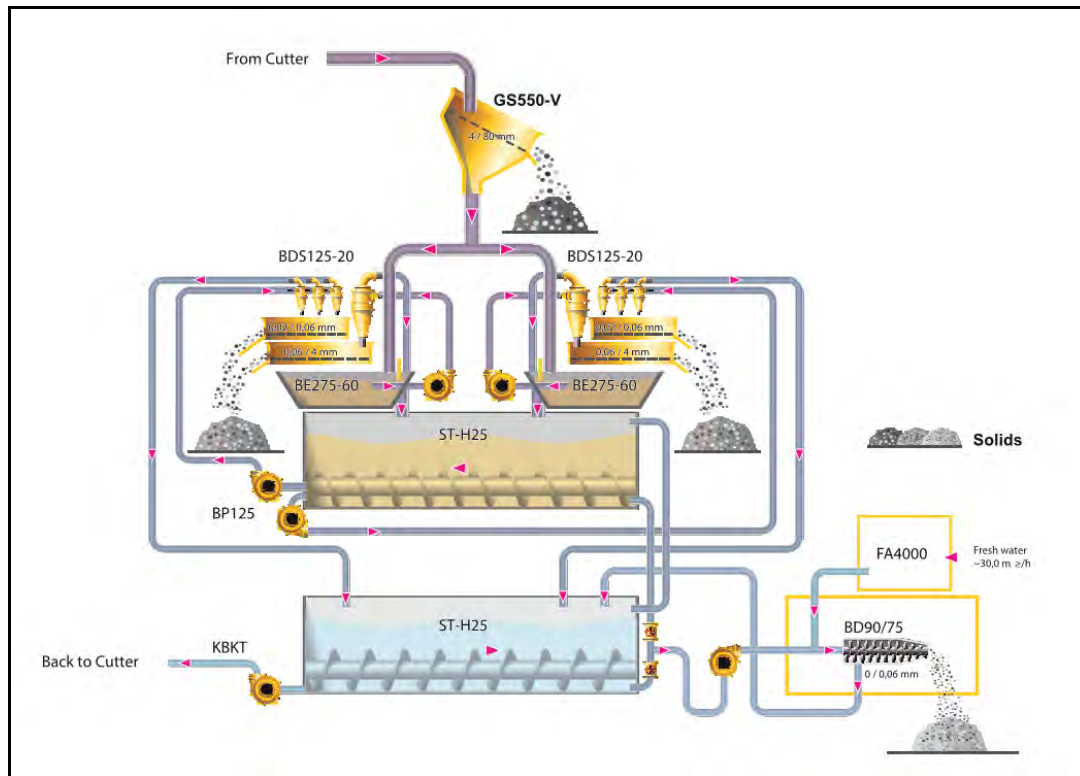


Figure 3: Typical desander flow chart

In between panel excavations, the stored slurry may also be circulated through the desanders in order to filter out any particles which may sediment into the bottom of the storage tanks over time.

The waste material collected in front of the de-sander will be disposed of as spoil by AMC UK. The spoil stockpiles in front of the desanders will be loaded onto muck away lorries by the attending excavator. Care must be taken not to damage the tank or desander during the operation.

The arisings are expected to be non-hazardous inert material. The arisings will be subject to acceptability testing as per the site Material Testing Plan. Soil placement will be tracked and if test results indicate hazardous or non-inert material, the material will be lorried off site to a registered facility.



Figure 4: Photograph of typical storage tank



Figure 5: Typical desander drop-off areas

## 8. WASTE SLURRY

During panel excavation, desanding and concreting (as described in Section 7.), support slurry properties may get detrimentally affected to a point where the required parameters cannot be adjusted anymore by desanding or use of additives. Generally, the density is irreparably affected by a high content of ultra-fines and/or the viscosity is chronically high through pH level changes, e.g. through contact with concrete.

Where the slurry has lost its properties and requires disposing and has not been in contact with concrete, it will be sent to a flocculent and decanter station to reduce the amount of liquid waste that

is required to be disposed off-site. The pulverized flocculent additive is pre-mixed with water in the flocculent station's mixing tank. The dosage of flocculent additive is adjusted by an automatic metering device. The pre-mixed flocculent liquid is temporarily stored in an agitation tank and fed by a dosage pump into the slurry feed of the decanter from where the soil muck and excess process water is separated. Refer to the [Slurry Management Plan 40-AMC-WS-10-EN-PL-0002](#) for details on [Waste Slurry Disposal](#).

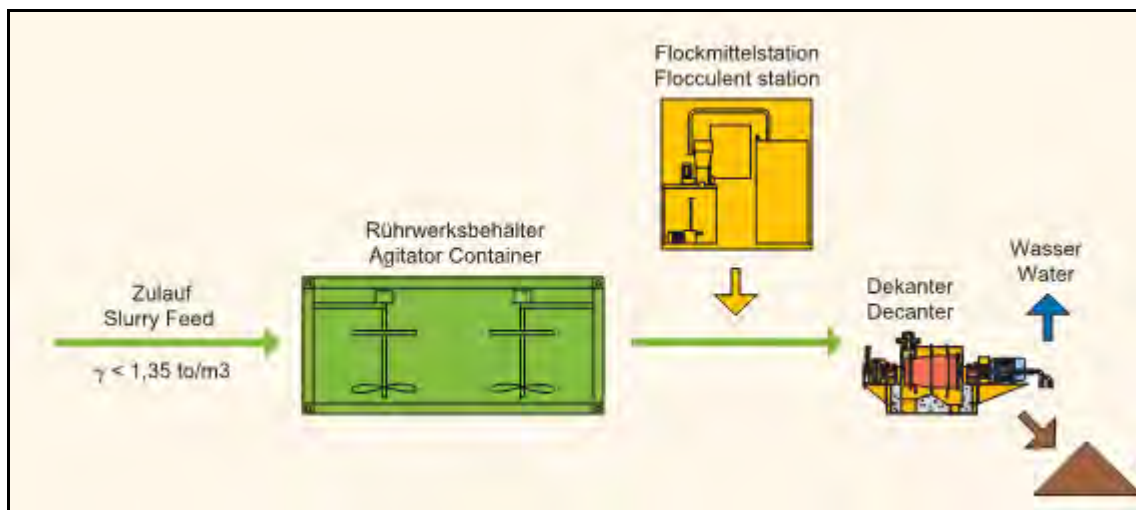


Figure 6: Arrangement of flocculent station and decanter

Where the bentonite slurry has been in contact with concrete and there is a risk of blocking the bentonite lines and equipment this will be sent to waste skips located next to the panel. Care must be taken to ensure all other connections are closed and/or disconnected during this operation to ensure the fluid which includes fresh concrete contamination does not reach the slurry farm. The pipe transferring the unwanted fluid will be securely connected to the skip by a swan neck adaptor. Once all waste has been transferred to the skip, water will be pumped into the skips through the pipes to clear any residual waste.



*Figure 7: Skip with waste slurry*

The liquid waste/waste support slurry will be disposed of as per the AMC UK Site Waste Management Plan (SWMP) Woodsmith Mine Site - Phase 4 –Diaphragm Wall Construction 40-AMC-WS-71-EN-PL-0006. Disposal usually involves transport of waste slurry from site to a tip using bulk tanker lorries.



*Figure 8: Typical tanker wagon*

## **9. SPILLAGES**

Major spillages of support slurry will be cleared as soon as possible using an excavator and pumps. The recovered materials may be re-introduced into the slurry system or disposed. Where the spillage is due to a blockage in the pipes, all pumps will be turned off until the blockage has been removed



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and the joints have been resealed. Any major spillages of bentonite will be dealt with in line with the Bauer Emergency Procedures (Appendix C) and the AMC UK Environmental Emergency Preparedness Plan (EPPP) Woodsmith Mine Site - Phase 4 –Diaphragm Wall Construction (40-AMC-WS-71- EN-PL-0005).

## **10. HEALTH AND SAFETY LEGISLATION**

All works are to be carried out in accordance with this method statement and the following documents:

- AMC UK Construction Phase Health & Safety Plan Woodsmith Mine Site - Phase 4 – Diaphragm Wall Construction (40-AMC-WS-71-PM-PL-0002)
- AMC UK Environmental Management Plan (EMP) Woodsmith Mine Site - Phase 4 – Diaphragm Wall Construction (40-AMC-WS-71-EN-PL-0004)
- AMC UK Environmental Emergency Preparedness Plan (EPPP) Woodsmith Mine Site - Phase 4 –Diaphragm Wall Construction (40-AMC-WS-71-EN-PL-0005)
- AMC UK Site Waste Management Plan (SWMP) Woodsmith Mine Site - Phase 4 – Diaphragm Wall Construction (40-AMC-WS-71-EN-PL-0006)
- Bauer Health and Safety Plan 40-AMC-WS-10-HS-PL-0001
- Bauer Environmental Plan 40-AMC-WS-10-EN-PL-0001
- Bauer Slurry Management Plan 40-AMC-WS-10-EN-PL-0002
- Bauer H&S Policy (Appendix D)
- Risk Assessment (Appendix B)
- COSHH Assessments (Appendix E)
- All relevant regulations, HSE Guidance Notes, Environmental Agency Guidance Notes, Codes of Practice, National and International Standards.

## **11. COSHH**

*The Control of Substances Hazardous to Health Regulations, 2002*, (C.O.S.H.H. Regulations), requires that an assessment is undertaken of health risks created by work involving substances hazardous to health. These refer to the use of chemicals on a site and state that the precautions to be taken are recorded on a Substance C.O.S.H.H. Record.

The C.O.S.H.H. Assessment Record is based on information obtained from a data sheet received from the substance supplier.



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A copy of all the Company's Substance Identification Records are held on site and are shown in Appendix E.

## **12. FIRST AID ARRANGEMENTS**

The First Aid arrangements for the site are detailed in the AMC UK Construction Phase Health & Safety Plan Woodsmith Mine Site - Phase 4 –Diaphragm Wall Construction 40-AMC-WS-71-PM-PL-0002. Sirius Minerals provides a full time paramedic. In addition, Bauer will provide first aid kits and at least three first aiders per shift.

## **13. PERSONAL PROTECTIVE EQUIPMENT**

- High Visibility Clothing (EN 471)
- Eye Protection (EN 166F)
- Hearing Protection (EN 352)
- Safety Helmets (EN397 MM, LD)
- Protective Gloves (EN 388)
- Safety Harness for working at height and in vicinity of open bore (EN 361)
- Protective Footwear (EN 345 P) – Safety boots must have steel mid sole.

All Personal Protective Equipment will be replaced as required during the contract. Safety harnesses will be stored appropriately and inspected on a regular basis as part of the lifting gear inspection regime.

## **14. ENVIRONMENTAL PROTECTION**

All works to be compliant with AMC UK Environmental Management Plan (EMP) Woodsmith Mine Site - Phase 4 –Diaphragm Wall Construction (40-AMC-WS-71- EN-PL-0004).

- Noise: The noise generated during operation of the slurry plant is monitored by AMC UK.
- Vibration: There is no risk of vibration that will affect the local community.
- Dust: Dust suppression will be implemented by AMC UK (e.g. dampening of dusty areas). Bauer will minimise dust during bulk powder deliveries.
- Spillages: Refer to section 9
- Ground and Surface Water: Refer to the AMC UK Environmental Management Plan (40-AMC-WS-71- EN-PL-0004) and Bauer's Slurry Management Plan (YPM-BAU-SMP-BEN) for monitoring, controls and mitigation.



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## **15. MANUAL HANDLING**

Mechanical plant is provided as far as possible to reduce manual handling to a minimum. Due to the nature of the work, cranes will be mainly used for most lifting operations and moving of plant and equipment.

Manual handling will be limited to the carrying of pipework and bags.

## **16. ACCIDENTS, INCIDENTS AND RIDDOR**

The arrangements for Reporting of Injuries, Diseased and Dangerous Occurrences under the regulations are as detailed in the company safety manual, a copy of which will be held by the site supervisor. The ultimate responsibility for reporting/investigating is held by the BTL Health & Safety Manager. In the unfortunate event of any accident or near miss, the BTL Health & Safety Manager will be informed immediately and he in turn would forward details to the AMC UK Health & Safety Manager and if necessary, the HSE. This also applies to environmental incidents.

## **17. KEY CONTACTS & SITE PERSONNEL**

<b>Name</b>	<b>Company</b>	<b>Position</b>	<b>Assist</b>
Jonathan White	AMC UK	Operation Director	
Thomas Prinz	AMC UK	Site Supervisor	
Siegfried Wenninger	AMC UK	Lead Engineer - Mining	TBC
Hugh Medcalf	AMC UK	H&S Manager	
Gustav Jahnert	BAUER	Project Manager	
Norbert Hoffmann	BAUER	Sub-Agent	
Asad Khan	BAUER	Sub-Agent	
Nick Thomas	BAUER	HSEQ Manager	

All site personnel will have as a minimum a CSCS card and where applicable a CPCS card. All operatives will have their CSCS/CPCS cards.

Site Supervisors to hold SSSTS certification and Site Manager will hold SMSTS certification



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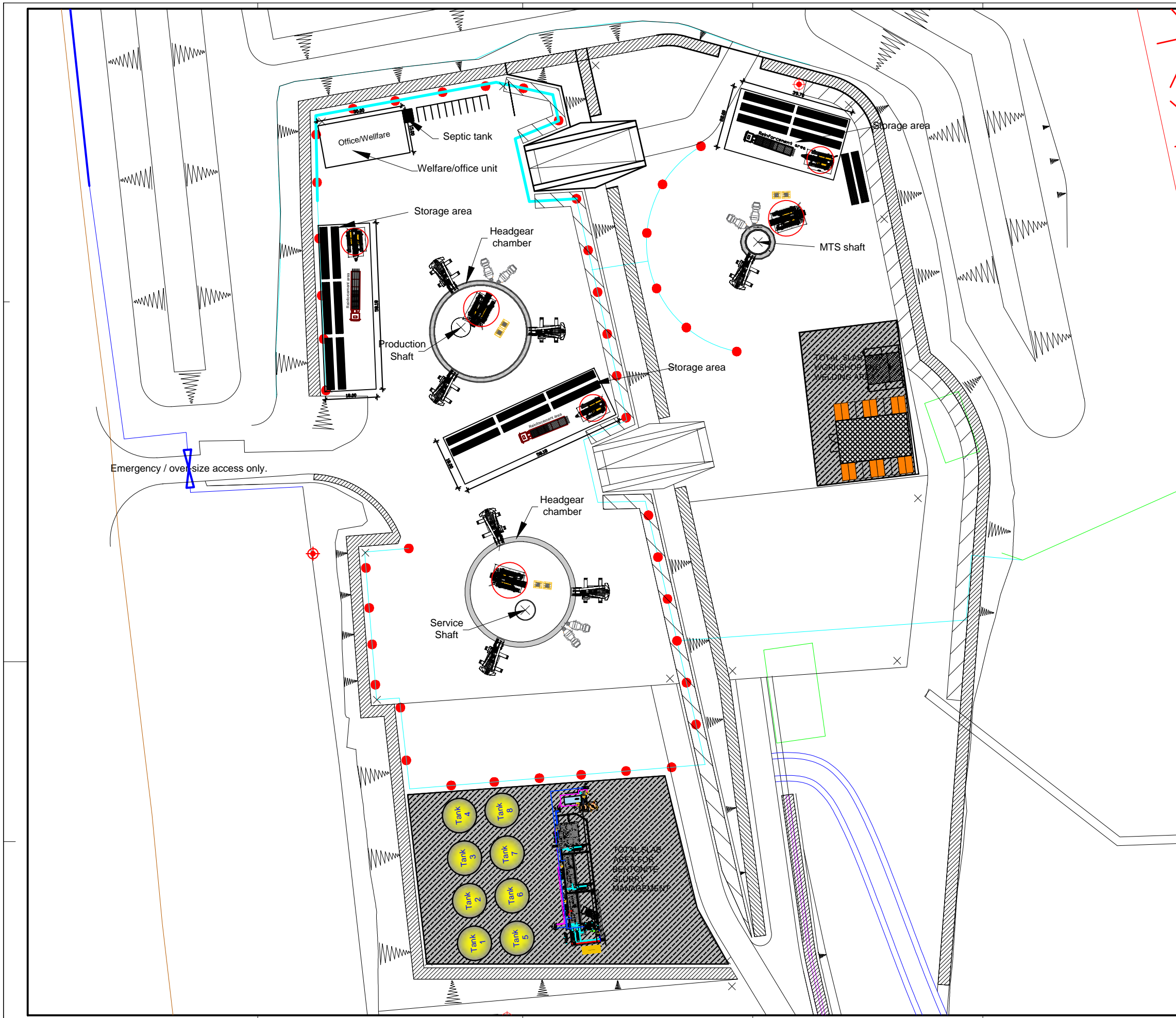
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## ***APPENDIX A – DRAWINGS***





**FOR PLANNING PURPOSES  
NOT FOR CONSTRUCTION**

± 0,00 =

ALL DIMENSIONS AND SERVICES  
HAVE TO BE CONFIRMED ON SITE!

CHANGE	DESIGNED BY	SITE ENGINEER	DATE	INDEX

A P P R O V E D

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	<b>BAUER Technologies Ltd</b> Millers Three, Southmill Road Bishops Stortford, Herts, UK, CM23 3DH
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CLIENT	Sirius Minerals Plc		
MAIN CONTRACTOR	Associated Mining Construction AMC (UK) Limited		
SUB CONTRACTOR	BAUER Technologies Limited		
PROJECT	NORTH YORKSHIRE POLYHALITE PROJECT		
DRAWING	Preliminary Diaphragm Wall Site Installation Option B: SS + PS 60 m and Farmer Tanks		
SCALE: No	DRAWN: B. Seifried	DATE: 25.05.2017	
	CHECKED: N. Hoffmann	DATE: 25.05.2017	
	PLAN SIZE: A0	DESIGNED BY: BAUER	DATE: 25.05.2017
PROJECT NO.: A	DRAWING NO.:	Rev_03	



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## ***APPENDIX B – RISK ASSESSMENT***

Hazard/Risk Assessment												
				RA Number	1				Sheet	1 of 1		
Operation/Task: Lifting				MS Name	Slurry plant mob, operation and demob							
				MS No	YPM-BAU-MS-03			RA Written by	Gustav Jahnert			
Location/Area: North Yorkshire Polyhalite Project - WOODSMITH MINE				Name of person completing Assessment								
Item	Activity	Hazards/Risks Identified	Risk Rating			Control	Risk Rating			Responsibility	Monitoring Responsibility	
			S	L	RR		S	L	RR			
1	Lifting operations using crane	Poor ground conditions could cause plant to overturn causing injury and damage to property	4	4	16	No work to commence until working platform certificate is in place. Working platform to be checked and maintained (by AMC) as required and in particular post inclement weather. Crane CE marked and not older than 7 years. New thorough examination to be in place for the crane.	4	1	4	Site Supervisor	Site management	
		Lifting gear could fail, dropped load causing injury or damage to property	4	4	16	Lift supervisor to check all test certificates are in date and lifting gear has individual ID and inspection tag. Slinger signaller to use lifting gear as detailed in the approved lift plan. Slinger to carry out visual inspection of equipment prior to any lifting operations. AP to check driver is qualified prior to commencement of lifts. AP to check slinger/signaller is qualified prior to commencement of lifts.	4	1	4	Site Supervisor, Lifting Supervisor, Slingers/ Signaller	Appointed person	
		Plant could fail, dropped load causing injury or damage to property	4	4	16	All lifting operations to be carried out in accordance with the approved lift plan. All lift plans to be prepared by an Appointed Person. All lifts to be carried out by qualified operator and trained slinger/signaller. Taglines to be used to control all lifted loads Ensure the lifting area is clear of people not involved in the operation (maintain barriers around piling area)	4	1	4	Site Supervisor, Lifting Supervisor, Slingers/ Signaller	Appointed person	
<b>KEY</b>												
Severity		Likelihood		Risk Rating			Catastrophic		Extremely Harmful		Harmful	Slightly Harmful
4	Very severe	4	Very high	13-16	Intolerable	Very likely	16	12	8	4		
3	Severe	3	High	8-12	Substantial	Likely	12	9	6	3		
2	Minor	2	Moderate	5-7	Moderate	Unlikely	8	6	4	2		
1	Negligible	1	Low	1-4	Tolerable	Highly unlikely	1	3	2	1		
Approved by: Nicholas Thomas		Signature							Date:	26/05/2017		

Hazard/Risk Assessment												
				RA Number		2			Sheet		1 of 1	
Operation/Task:		Mobilisation, demobilisation & deliveries				MS Name		Slurry plant mob, operation and demob				
						MS No		YPM-BAU-MS-03		RA Written by		Gustav Jahnert
Location/Area:		North Yorkshire Polyhalite Project - WOODSMITH MINE				Name of person completing Assessment						
Item	Activity	Hazards/Risks Identified	Risk Rating			Control	Risk Rating			Responsibility	Monitoring Responsibility	
			S	L	RR		S	L	RR			
1	Mobilisation, demobilisation and deliveries of plant and equipment	Crushing caused by movements of trucks	4	4	16	Manoeuvre all trucks using a trained banksman. Keep all delivery vehicles on designated haul roads and loading areas. Only trained personnel to operate and erect the equipment. Ensure delivery vehicles have all equipment in good working condition and to CLOCS standards i.e. warning lights, warning sounds etc.. Carry out daily inspections.	4	1	4	Banksman	Site Supervisor	
		Falls from height	4	4	16	All personnel to wear a full body harness clipped onto approved attachment points while working at heights. No operatives will access or work on the trailer bed without fall prevention measures in place. Where possible loads should be pre-slung to avoid the need to access the trailer bed. If not possible, edge protection should be erected against the side of the trailer, or fall arrestors and harnesses should be used attached to fixed point above.  Check security of loads prior to unloading. If loads have moved during transport or are unsafe then the load will be rejected and returned.	4	1	4	Lift Supervisor / Slinger and Signaller	Site Supervisor	
<b>KEY</b>												
Severity		Likelihood		Risk Rating		Catastrophic		Extremely Harmful		Harmful	Slightly Harmful	
4	Very severe	4	Very high	13-16	Intolerable	Very likely	16	12	8	4		
3	Severe	3	High	8-12	Substantial	Likely	12	9	6	3		
2	Minor	2	Moderate	5-7	Moderate	Unlikely	8	6	4	2		
1	Negligible	1	Low	1-4	Tolerable	Highly unlikely	1	3	2	1		
Approved by:		Nicholas Thomas			Signature			Date:		26/05/2017		

### Hazard/Risk Assessment

RA Number		3			Sheet		1 of 1				
Operation/Task: Unloading delivery vehicles		MS Name		Slurry plant mob, operation and demob							
MS No		YPM-BAU-MS-03			RA Written by		Gustav Jahnert				
Location/Area: North Yorkshire Polyhalite Project - WOODSMITH MINE		Name of person completing Assessment									
Item	Activity	Hazards/Risks Identified	Risk Rating			Control	Risk Rating			Responsibility	Monitoring Responsibility
			S	L	RR		S	L	RR		
1	Unloading delivery vehicles	Working on trailer without edge protection.	4	4	16	No operatives will access or work on the trailer bed without fall prevention measures in place. Where possible loads should be pre-slung to avoid the need for access on to the bed of trailer. If not possible, edge protection should be erected against the side of the trailer, or fall arrestors and harnesses should be used attached to fixed point above.	4	1	4	Operatives	Site Supervisor
		Falling loads from lifting operations	4	4	16	Ensure all personnel not involved in the operations are kept clear of the load The slinger signaller will control and maintain the work area at all times. All long loads will be controlled with rope tag lines. All lifting operations to be carried out in accordance with the approved lift plan. Check security of loads prior to unloading. If loads have moved during transport or are unsafe then the load will be rejected and returned.	4	1	4	Lift Supervisor / Slinger and signaller	Site Supervisor
		Using ladders or steps to access/egress the trailer	4	4	16	Where possible use of ladders must be avoided and alternative means of access to lorries/trailers must be used such as access steps, elevated platforms etc. If no other means of access is available then a permit to use ladders must be obtained from AMC prior to using ladders. Ladders must be in good condition and regularly inspected. Ladders must be secured or footed at all times. A three point contact must be maintained at all times by the operatives. A permit for use of ladders must be obtained before use. The ladder inspection tag has to be in place.	4	1	4	Operatives / Supervisors	Site Management
<b>KEY</b>											
Severity		Likelihood		Risk Rating		Catastrophic	Extremely Harmful		Harmful	Slightly Harmful	
4	Very severe	4	Very high	13-16	Intolerable	Very likely	16	12	8	4	
3	Severe	3	High	8-12	Substantial	Likely	12	9	6	3	
2	Minor	2	Moderate	5-7	Moderate	Unlikely	8	6	4	2	
1	Negligible	1	Low	1-4	Tolerable	Highly unlikely	1	3	2	1	
Approved by: Nicholas Thomas		Signature						Date:		26/05/2017	

Hazard/Risk Assessment											
					RA Number	4			Sheet	1 of 2	
Operation/Task: Working on Bentonite Plant					MS Name	Slurry plant mob, operation and demob					
					MS No	YPM-BAU-MS-03			RA Written by	Gustav Jahnert	
Location/Area: North Yorkshire Polyhalite Project - WOODSMITH MINE					Name of person completing Assessment						
Item	Activity	Hazards/Risks Identified	Risk Rating			Control	Risk Rating			Responsibility	Monitoring Responsibility
			S	L	RR		S	L	RR		
1	Access to bentonite plant	Slips, trips and falls due to poorly maintained access	3	4	12	Only approved Bauer personnel to have authorised access to bentonite plant. The bentonite plant boundary will be fenced off to restrict unauthorised access. Appropriate signage will be displayed around the plant showing access and egress routes. Regular housekeeping to the plant will be carried out by the bentonite plant team. All spillages will be contained and cleaned up immediately. Boundary fences to be checked regularly by supervisor to ensure it is secure. Safe walkway will be established where required.	3	1	3	Bentonite Operatives / Supervisor	Site Supervisor
2	Pumping dry bentonite powder into silo	Inhalation of dust causing lung diseases	3	4	12	Dry powder silo sock to be used when pumping powder, this will contain the powder in case of a burst or loose connection to silo. All personnel to wear a FFP3 particle dust mask when pumping bentonite powder to silo.	3	1	3	Bentonite Operatives / Supervisor	Site Supervisor
		Dust entering eye	3	4	12	Always wear eye protection. Wash eyes immediately if dust enters eye. Ensure there are sufficient hygiene/washing facilities available nearby.	3	1	3	Bentonite Operatives / Supervisor	Site Supervisor
3	Working close to stack tanks	Falling objects causing injury	3	3	9	Ensure equipment is stored correctly after use. Regular house keeping carried out to the plant. 'Tidy as you go' policy to be adopted. Toe boards to be installed to walkways on stack tanks ensuring small tools etc. can not fall through small gaps.	3	1	3	Bentonite Operatives / Supervisor	Site Supervisor
		Damage to hearing due to excessive noise	3	3	9	Specific noise risk assessment will be carried out which will be covered under a separate document 'occupational health plan' and issued to AMC.	3	1	3	Operatives / Supervisor	Site Supervisor
4	Clearing desander muck stockpile	Excavator damaging bentonite plant equipment	3	3	9	Excavator driver to be briefed on extents of working area. If required, protect back of agitation tank.	3	1	3	Site Supervisor	Project Manager
		Excavator damaging cables	4	3	12	Protect buried cables with vertical concrete barriers or steel plates (e.g. trench sheets). Alternatively, cables can be installed out of reach of excavator (e.g. elevated on desander walkway). If cables are fixed to walkway of desander, the connection needs to be isolated to avoid electrification of walkway. In any case, warning signs have to be displayed in the area defining the minimum safety clearance from buried cables.	4	1	4	Site Supervisor	Project Manager
<b>KEY</b>											
Severity		Likelihood		Risk Rating			Catastrophic	Extremely Harmful		Harmful	Slightly Harmful
4	Very severe	4	Very high	13-16	Intolerable	Very likely	16	12	8	4	
3	Severe	3	High	8-12	Substantial	Likely	12	9	6	3	
2	Minor	2	Moderate	5-7	Moderate	Unlikely	8	6	4	2	
1	Negligible	1	Low	1-4	Tolerable	Highly unlikely	1	3	2	1	
Approved by: Nicholas Thomas					Signature			Date:		26/05/2017	

Hazard/Risk Assessment											
					RA Number	4			Sheet	2 of 2	
Operation/Task: Working on Bentonite Plant					MS Name	Slurry plant mob, operation and demob					
					MS No	YPM-BAU-MS-03			RA Written by	Gustav Jahnert	
Location/Area: North Yorkshire Polyhalite Project - WOODSMITH MINE					Name of person completing Assessment						
Item	Activity	Hazards/Risks Identified	Risk Rating			Control	Risk Rating			Responsibility	Monitoring Responsibility
			S	L	RR		S	L	RR		
4	Working on stack tanks and desander	Falling from height causing injury	4	3	12	Safe walkways with handrails erected to access to stack tanks and desander. Scafftags will be in place. Weekly inspections will be carried out. Only authorised Bauer personnel allowed to work on top of stack tanks and desander. Walkway to be kept clear of any objects at all times and regular housekeeping carried out. Display warning signs as required. Scaffold ladder access points to be protected with gates or hatches.	4	1	4	Bentonite Operatives / Supervisor	Site Supervisor
		Whole Body Vibration	3	2	6	Any items of plant and equipment with a potential of WBV will be risk assessed. The specific risk assessments will be covered in the 'occupation health plan' and issued to AMC.	3	1	3	Bentonite Operatives / Supervisor	Site Supervisor
5	Working with electrical equipment or cables	Electrocution	4	4	16	All equipment to be installed by a qualified electrician. All equipment to have a valid PAT test certificate. Any damaged equipment or cables to be put out of use and notified to the manager for repairs or removed from site. Electrical permit to be obtained prior to any electrical work being carried out.	4	1	4	Bentonite Operatives / Supervisor	Site Supervisor
6	Desanding/Pumping bentonite	Spillages causing environmental hazard and slips trips and falls	3	2	6	Bentonite spillages within the plant will be contained by bunds made in the slab. Spillages outside plant will be either pumped back to the plant or to skips. Spillages that cannot be pumped will be cleaned up by an attending excavator. All spillages to be cleaned up immediately. Any major spillages outside the plant will be communicated to management who will inform AMC.	3	1	3	Bentonite Operatives / Supervisor	Site Supervisor
		Spillages causing slippery surface which becomes dangerous for personnel to walk on	3	3	9	Area to be demarcated with no one allowed within the 'spill zone'. Supervisor to be notified and spill cleaned up immediately.	3	1	3	Bentonite Operatives / Supervisor	Site Supervisor
<b>KEY</b>											
Severity		Likelihood		Risk Rating			Catastrophic	Extremely Harmful		Harmful	Slightly Harmful
4	Very severe	4	Very high	13-16	Intolerable	Very likely	16	12	8	4	
3	Severe	3	High	8-12	Substantial	Likely	12	9	6	3	
2	Minor	2	Moderate	5-7	Moderate	Unlikely	8	6	4	2	
1	Negligible	1	Low	1-4	Tolerable	Highly unlikely	1	3	2	1	
Approved by: Nicholas Thomas					Signature			Date:		26/05/2017	

### Hazard/Risk Assessment

Operation/Task: Electrical connection to bentonite plant		RA Number	5			Sheet	1 of 1					
Location/Area: North Yorkshire Polyhalite Project - WOODSMITH MINE		MS Name	Slurry plant mob, operation and demob			RA Written by	Gustav Jahnert					
		MS No	YPM-BAU-MS-03									
		Name of person completing Assessment										
Item	Activity	Hazards/Risks Identified	Risk Rating			Control	Risk Rating			Responsibility	Monitoring Responsibility	
			S	L	RR		S	L	RR			
1	Wiring of bentonite plant	Electrocution	4	4	16	No works to be carried out until an electrical permit has been obtained from AMC. Only qualified personal to be allowed to work on wiring the bentonite plant. Any damaged equipment or cables to be put out of use and brought to the attention of management for repairs or taken off site. Keep all connections between cables above ground avoiding contact with liquid due to spillages or rain on the bentonite slab. Electrical permit to be obtained prior to any electrical work being carried out.	4	1	4	Electrician	Site Supervisor	
KEY												
Severity	Likelihood	Risk Rating			Catastrophic	Extremely Harmful		Harmful	Slightly Harmful			
4 Very severe	4 Very high	13-16	Intolerable	Very likely	16	12		8	4			
3 Severe	3 High	8-12	Substantial	Likely	12	9		6	3			
2 Minor	2 Moderate	5-7	Moderate	Unlikely	8	6		4	2			
1 Negligible	1 Low	1-4	Tolerable	Highly unlikely	1	3		2	1			
Approved by:	Nicholas Thomas		Signature					Date:	26/05/2017			



### Hazard/Risk Assessment

				RA Number	6			Sheet	1 of 1				
Operation/Task:		Erecting Scaffold Access			MS Name		Slurry plant mob, operation and demob						
					MS No		YPM-BAU-MS-03		RA Written by		Gustav Jahnert		
Location/Area:		North Yorkshire Polyhalite Project - WOODSMITH MINE			Name of person completing Assessment								
Item	Activity	Hazards/Risks Identified	Risk Rating			Control	Risk Rating			Responsibility	Monitoring Responsibility		
			S	L	RR		S	L	RR				
1	Installing handrails and walk ways to stack tanks and desander	Incorrect or loose scaffold access system and handrails could cause personnel to fall	4	4	16	Only approved and qualified scaffolders allowed to erect walkway. Checks to be carried out before use within 7 days of the previous inspection, after any major adaption, if the scaffolding has been damaged and after adverse weather conditions. Up to date certificates to be issued.	4	1	4	Scaffolder	te Supervisor/Manag		
KEY													
Severity		Likelihood		Risk Rating		Catastrophic		Extremely Harmful		Harmful		Slightly Harmful	
4	Very severe	4	Very high	13-16	Intolerable	Very likely	16	12	8	4			
3	Severe	3	High	8-12	Substantial	Likely	12	9	6	3			
2	Minor	2	Moderate	5-7	Moderate	Unlikely	8	6	4	2			
1	Negligible	1	Low	1-4	Tolerable	Highly unlikely	1	3	2	1			
Approved by:		Nicholas Thomas			Signature					Date:		26/05/2017	

### Hazard/Risk Assessment

				RA Number	7				Sheet	1 of 1	
Operation/Task:		Work Environment			MS Name		Slurry plant mob, operation and demob				
					MS No		YPM-BAU-MS-03		RA Written by		Asad Khan
Location/Area:		North Yorkshire Polyhalite Project - WOODSMITH MINE			Name of person completing Assessment						
Item	Activity	Hazards/Risks Identified	Risk Rating			Control	Risk Rating			Responsibility	Monitoring Responsibility
			S	L	RR		S	L	RR		
1	Moving within bentonite plant	Poor lighting could cause personnel to slip, trip or fall	4	3	12	Provide general lighting and task lighting as <a href="#">required</a> .	4	1	4	Electrician	Supervisor
		Cold temperatures in winter can produce ice causing personnel to slip and fall	4	3	12	Provide salt to de-ice surfaces in cold weather	4	1	4	Supervisor	Supervisor
<b>KEY</b>											
Severity		Likelihood		Risk Rating		Catastrophic		Extremely Harmful		Slightly Harmful	
4	Very severe	4	Very high	13-16	Intolerable	Very likely	16	12		8	4
3	Severe	3	High	8-12	Substantial	Likely	12	9		6	3
2	Minor	2	Moderate	5-7	Moderate	Unlikely	8	6		4	2
1	Negligible	1	Low	1-4	Tolerable	Highly unlikely	1	3		2	1
Approved by:		Nicholas Thomas			Signature					Date: 26/05/2017	



Document Ref. YPM-BAU-MS-03\_RevC

Page No.18

Date: 25.05.17

Contract Title: NORTH YORKSHIRE POLYHALITE  
PROJECT – WOODSMITH MINE

Made By:  
AK

Checked by:  
JAG

Work Scope: Operation of slurry plant

## ***APPENDIX C – BAUER MAJOR SPILLAGE RESPONSE PLAN***



# SUPPORT SLURRY EMERGENCY PROCEDURE

If there is an emergency spillage of support slurry the following procedure must be followed

**AVOID STEPPING IN SUPPORT SLURRY AS IT WILL BE SLIPPERY AND YOU ARE LIKELY TO FALL**

Spillage during working hours – Bauer Staff

1. Cover all drains with drain covers
2. Ensure all valves are closed
3. Pump spillage back into the waste slurry skips or if useable back into storage.
4. Add sand/spoil to the area (if outside the bund) and use the attending excavator to clean/clear and scrape the area where the spillage occurred.
5. [Dispose the material in accordance with the Site Waste Management Plan or store within a bunded area until the material can be properly disposed.](#)

Spillage outside working hours

1. Bentonite system to be closed down by Bauer Staff [during a work stoppage.](#)
2. If spillage is noticed cover all drains with drain covers – Security Guards
3. Ring the emergency contact number
4. Bauer Staff to arrive
5. Pump spillage back into the waste slurry skips or if useable back into storage.
6. Add sand/spoil to the area (if outside the bund) and use the attending excavator to clean/clear and scrape the area where the spillage occurred.
7. Store the material [within a bunded area until the material can be properly disposed.](#)

All spillages are to be reported to the Bauer HSE department for recording and investigation.

HSE Department will report directly to AMC UK.

## EMERGENCY CALL OUT NUMBERS (AFTER HOURS)

Name	Title	Contact Number
Gustav Jahnert	Project Manager	- Will contact AMC UK
Asad Khan	Sub-Agent	- Will contact AMC UK
Nicholas Thomas	HSEQ Manager	- Will contact AMC UK



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Page No.19

Date: 25.05.17

Contract Title: NORTH YORKSHIRE POLYHALITE  
PROJECT – WOODSMITH MINE

Made By:  
AK

Checked by:  
JAG

Work Scope: Operation of slurry plant

## ***APPENDIX D – BAUER H&S POLICY***

## Staying Safe & Healthy

Bauer Technologies is committed to ensuring the safety and health of our employees is not affected by the work they do. In order to ensure this we have implemented the following policies:

- Working Safely
- Working Hours
- Drugs and Alcohol
- Driving Safely



## Policy Booklet

### Drugs & Alcohol

We are committed to a healthy & safe working environment for our people. Accordingly the consumption or sale of alcohol or drugs at our places of work is prohibited. In order to ensure that everyone is aware of the acceptable standards and to ensure employees are treated in a fair and consistent manner we have put in place the following policy.

Employees should:

- Not present themselves for work if, due to alcohol or drugs, they are unfit,
- Not present themselves for work if they have just consumed or taken drink or drugs.
- Not be in possession of drink or drugs in the workplace (this includes in any company vehicles).
- Not consume or take drink or drugs whilst at work

If employees are on prescribed medication or are taking medicines that may make them drowsy, e.g. cold cures, Solpadine, hay fever remedies, etc. they should advise their Doctor to seek alternatives AND report the fact to the Health & Safety Manager who can check the possible effects of any medicines using the 'Chemist on Call' service provided by Healthcare Connections.

If employees are considered unfit for work then we have a legal duty to test their blood, urine or breath for drink or drugs.

For the purpose of 'general' works the drink drive limits will be adopted as the limits for detection of testing unless the work is classified as safety critical (e.g. when working on Network Rail infrastructure or similar) in which case the limits shall be:

- More than 29 milligrams per 100ml of blood;
- More than 13 micrograms of alcohol in 100ml of breath; or
- More than 39 milligrams of alcohol in 100ml of urine.

Any traces of illegal drugs, such as Cannabis, Cocaine, Amphetamines, Barbiturates, Methadone's etc. found will be deemed a positive test result.

If an employee is taking any medication they must declare this at the time of testing. If laboratory analysis reveals the presence of prohibited substances consistent with a therapeutic dosage of undeclared medication the employee will be interviewed to establish the reason for non-declaration. If the Medical Officer is satisfied a 'negative' result may be given. If the Medical Officer is not satisfied this will be recorded as a No Result and the employee must be re-tested immediately and will not be allowed to work until a negative (pass) result is achieved.

Any employee who is tested and is identified as positive for alcohol or drugs shall be subject to disciplinary action. A refusal to submit to test shall be subject to the same disciplinary action as a positive result.

All employees who hold PTS certification or are holders of Safety Critical Work posts should be aware that while working on Network Rail Managed Infrastructure, additional legislation is applicable to them and their work. In particular the Transport and Works Act 1992 Part 2 Section 27 specifically notes the need for employees to be free from the effects of Alcohol and Drugs. The requirements of Network Rail Company Standard **NR/L1/OHS/051** applies. If proved positive the individual's NCCA card will be removed and they will be immediately suspended, removed from the Contract and possibly the Company and reported to NCCA & Network Rail. Testing will be carried out by Link-Up approved medical providers.

The Company will not victimise employees who admit to having a drink or drug related problem if they approach the Company for help and are prepared to undergo an agreed form of treatment. We offer to assist any employee who voluntarily declares an alcohol or drug related problem. This will include confidential support and guidance to employees and their families. If you have or think that you may be developing an alcohol or drug related problem



## Policy Booklet

then you must advise the Managing Director immediately so that the help procedures can be applied. Disclosure or discovery of a problem prompted by a positive test result or an impending test is not acceptable.

All employees are strongly advised to leave 12 hours between drinking and commencing a shift. Don't forget to take into account any on-call, weekend or night shift work. Unannounced drug & alcohol testing will be carried out annually on a random selection of staff and operatives and our sub-contractors on a no-notice basis.

All new employees (and those existing employees who wish to start work on Network Rail Managed Infrastructure) will be required to undertake full screening for drugs and alcohol before employment. We will not knowingly employ people who are either recreational or habitual users of drugs.

For-cause screening will be carried out with no notice if there are reasonable grounds to suspect that an individual is under the influence of alcohol or drugs, or if their behavior prompts it, or if there has been an incident or accident in the work area.

Many of our clients also have a policy of unannounced screening for which no notice will be given.

Martin Blower  
Managing Director  
January 2015





## Policy Booklet

### Working Hours

In order to safeguard our employees and ensure they can work safely in accordance with procedures we have implemented the following policy in relation to the hours which our employees work.

- No person shall work more than 13 consecutive turns of duty
- No person shall spend more than 72 hours at the workplace in any consecutive 7 day period.
- No turn of duty shall be rostered to consist of more than 12 hours at the workplace
- The minimum time away from the workplace between turns of duty shall be 12 hours except that a short break of 8 hours between shifts is permitted: -
  - When changing turns at weekends or
  - When there are short breaks between no more than 2 consecutive shifts
- The maximum permitted traveling time is limited such that the total time of travel plus planned shift length does not exceed 14 hours. In any case travelling time prior to the start of the shift must not exceed 3 hours.

Note: the 'time' at the workplace does not include traveling time incurred by relief staff, redundancy traveling time, or 'wash up' or 'handover' time incurred by staff in some functions. The workplace means the site of work or it's booking on point.

Where staff are called out after completing a normal day of duty then providing the call out ends before 22:30 hours with at least 9 hours rest after call out then this will not prevent the individual from taking up their normal day turn at the normal booking on time. It is not expected that these circumstances should apply more than twice during a week.

Changes to working time patterns which introduce a need to work outside of the stated limits must be subjected to a formal risk assessment. Consultation with the staff affected by the change allows an opportunity for fatigue to be discussed.

#### DISPENSATION FROM LIMITS

The above limits will be observed in all cases. It is recognised however that in exceptional circumstances where owing to adverse weather, emergency, equipment failure, accident or other incident, extended working exceeding these limits may be necessary in order to avoid or reduce risk to people or significant disruption to services and it is not reasonably practicable to make alternative arrangements.

If any of the above circumstances occur the Supervisor will inform the Construction Manager and the Project Manager and complete an incident form detailing the circumstance. Where required the shift supervisor will ensure that all documentation has been completed and copied to the site file.

#### RECORDING

For each job a working hours (timesheet) form will be completed. The form will be completed per shift by the Supervisor and will detail:

- The member of staff
- The total travel time for the day
- The total working time – including any standing time

The form when completed will be returned to the Operations Manager for review, filing and where appropriate collating into a report. The form will be reviewed by the Project Manager, signed off and filed as appropriate. Where required by the Principal Contractor this information will be made available.

Where the records show that members of staff have exceeded the working time regulations this will be recorded



## Policy Booklet

and the data made available for the regular management meetings.

### MONITORING AND REVIEW

In view of the increased risk potential of staff accidents resulting from staff exceeding the working time limits it is necessary, as part of the monitoring process for the management to review the working hour reports. The statistics provided will be reviewed at management meetings and where appropriate regular exceedences are subject to discussion at this meeting.

The requirements of the Working Hour Regulations must be considered when compiling work rotas. The job sheet relating to a particular job is to be signed off in the relevant section to signify it has been reviewed and resourced for Working Hour Regulations by the Project Manager.

This policy conforms to the Working Time Regulations and Network Rail Standards NR/GN/INI/001 & NR/L2/ERG/003

Martin Blower  
Managing Director  
January 2015



## Policy Booklet

### Driving for Work

Driving is one of the most hazardous activities which many of us undertake on a daily basis. A Company Car Handbook is provided to all employees who have access to a company car. However over and above this all employees who drive are required to consider the following points in order to minimise the risk of being involved in an accident.

- Plan your journey to include a 15 minute break approximately every two hours of driving.
- Allow plenty of time for your journey.
- Plan your route well in advance.
- Try to avoid peak hour traffic and areas with heavy traffic congestion where possible.
- Plan your workload carefully & raise any schedule conflicts with your line manager
- Do not undertake unnecessary journeys if there is specific risk of adverse weather conditions.

If you feel tired or drowsy, find a safe place to take a stop and take a break. Feeling tired at the wheel can affect your ability to concentrate, correctly perceive, assess and respond to road hazards and to make safe driving decisions.

It is your responsibility to ensure your car is properly maintained to comply with the manufacturer's recommendations, relevant laws and regulations. You should arrange routine vehicle servicing and carry out routine checks in line with the vehicle manufacturer's recommendations.

It is illegal to use a hand held mobile phone while driving. The definition of a 'hand held phone' will include any electronic device used for accessing oral, text or pictorial communications (including the internet) if the device is hand held during at least part of its operation. The definition of 'holding a phone' does not include operating a phone that is held in a cradle. You will be regarded as 'driving' if the engine is running – even if the vehicle is stationary. The law also states that drivers must have a proper control of their vehicles at all times. You can be prosecuted for careless or inconsiderate driving, or even dangerous driving, if using a phone causes you to drive in this manner.

If you are not an 'essential car user' you will not be expected to take calls when driving, but you will be expected to stop at the most convenient point within your journey and return the call. You must at all times drive with your own and others safety in mind. Essential car users are defined as those who have the use of a company vehicle or receive a car allowance.

Any accident which occurs whilst driving on company business should be reported regardless of whether the vehicle is a company car or not. Driving on company business does not include driving to or from your regular place of work.

You are required to inform your line manager if you have been convicted of a driving offence or banned from driving a vehicle. Failure to do so may lead to disciplinary action.

Martin Blower  
Managing Director  
January 2015





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Page No.20

Date: 25.05.17

Contract Title: NORTH YORKSHIRE POLYHALITE  
PROJECT – WOODSMITH MINE

Made By:  
AK

Checked by:  
JAG

Work Scope: Operation of slurry plant

## ***APPENDIX E – COSHH ASSESSMENT***

# COSHH Assessment Form



COSHH Assessment Number	BTL 122		
Product/Substance Name(s)	Concrete Ready mix		
Uses	General Construction		
Risks to health	Irritant		
Storage precautions	Store in mixer until required		
Transport precautions	Transported in ready mix trucks Concrete pipes to be inspected before use		
Manual Handling precautions	Not applicable		
Factors which increase risks	Wind can cause dust to be breathed in		
Name, address and telephone number of supplier of substance: Tremco Coupland Road, Hindley Green, Wigan, WN2 4HT			
<b>HARMFUL EXPOSURE ROUTES (tick relevant options)</b>			
Eye Contact	<input checked="" type="checkbox"/>	Ingestion	<input checked="" type="checkbox"/>
Skin Contact	<input checked="" type="checkbox"/>	Skin Absorption	<input type="checkbox"/>
Inhalation	<input type="checkbox"/>	Injection / sharps	<input type="checkbox"/>
Symptoms of over exposure	Not applicable		
Personal protective equipment: (state type and when to be worn) Hi Visability Clothing Gloves Safety Boots Hard Hat Overalls General purpose safety glasses (EN166 F)			
<b>EMERGENCY ACTIONS</b>			
Emergency action: first aid	On skin =wash off and flush with clean water Eyes =purge with eye wash for min 15 mins If irritation occurs seek medical advice		
Emergency action: fire	Non combustible		
Emergency action: spillage	Do not allow into water courses or drains		
Disposal precautions:	Dispose of as general construction waste		
Emergency action: contact person	R. Ayres =		
Authorized by		Date approved	23/08/12

# COSHH Assessment Form



COSHH Assessment Number	BTL 107		
Product/Substance Name(s)	Diesel oil		
Uses	Fuel oil		
Risks to health	Irritant Harmful Toxic		
Storage precautions	Store in double bunded diesel containers		
Transport precautions	Transport in double bunded bowsers		
Manual Handling precautions	None moved in double bunded containers		
Factors which increase risks	Mixing with other substances		
Name, address and telephone number of supplier of substance: Murco Petroleum Ltd St Albans			
<b>HARMFUL EXPOSURE ROUTES (tick relevant options)</b>			
Eye Contact	<input checked="" type="checkbox"/>	Ingestion	<input checked="" type="checkbox"/>
Skin Contact	<input checked="" type="checkbox"/>	Skin Absorption	<input type="checkbox"/>
Inhalation	<input checked="" type="checkbox"/>	Injection / sharps	<input type="checkbox"/>
Symptoms of over exposure	Drowsiness and dizziness		
Personal protective equipment: (state type and when to be worn) Gloves Safety Boots Overalls General purpose safety glasses (EN166 F) Hard Hat Hi Visibility Clothing			
<b>EMERGENCY ACTIONS</b>			
Emergency action: first aid	Eyes <wash out Skin <wash with soap and water Ingestion <DO NOT INDUCE VOMITING. seek medical advice Inhalation <remove to fresh air seek medical advice		
Emergency action: fire	Carbon dioxide, dry powder or foam		
Emergency action: spillage	Spillage will be limited due to less than 5 litres held Contain spillage, do not allow into water course Treat as environmental spillage		
Disposal precautions:	Via licenced waste remover		
Emergency action: contact person	R. Ayres – HSEQ Systems Manager		
Authorized by		Date approved	23/08/12

# COSHH Assessment Form











COSHH Assessment Number	BTL 108		
Product/Substance Name(s)	WD40		
Uses	Anti squeak, moisture repellent, releasing agent		
Risks to health	Irritant		
Storage precautions	Store in containers provided		
Transport precautions	Transport in containers provided		
Manual Handling precautions	None when used in aerosol containers		
Factors which increase risks	Mixing with other substances		
Name, address and telephone number of supplier of substance: WD40 Company Milton Keynes			
<b>HARMFUL EXPOSURE ROUTES (tick relevant options)</b>			
Eye Contact	<input checked="" type="checkbox"/>	Ingestion	<input checked="" type="checkbox"/>
Skin Contact	<input checked="" type="checkbox"/>	Skin Absorption	<input type="checkbox"/>
Inhalation	<input checked="" type="checkbox"/>	Injection / sharps	<input type="checkbox"/>
Symptoms of over exposure	Drowsiness, headache, nausea and dizziness		
Personal protective equipment: (state type and when to be worn) Gloves Safety Boots Overalls General purpose safety glasses (EN166 F) Hard Hat Hi Visibility Clothing			

## EMERGENCY ACTIONS

Emergency action: first aid	Eyes ?wash out Skin ?wash with soap and water Ingestion ?DO NOT INDUCE VOMITING. seek medical advice Inhalation ?remove to fresh air seek medical advice		
Emergency action: fire	Foam, water spray, dry chemicals, sand		
Emergency action: spillage	Contain spillage, do not allow into water course Treat as environmental spillage		
Disposal precautions:	Via licenced waste remover		
Emergency action: contact person	R. Ayres		
	Authorized by	R. Ayres	Date approved
			17.06.13

# COSHH Assessment Form



COSHH Assessment Number	BTL 136		
Product/Substance Name(s)	Lithium Grease		
Uses	Lubricating grease		
Risks to health: <input type="checkbox"/> Flammable  <input checked="" type="checkbox"/> Harmful  <input type="checkbox"/> Biohazard  <input type="checkbox"/> Corrosive  <input type="checkbox"/> Oxidising  <input type="checkbox"/> Toxic  <input checked="" type="checkbox"/> Environmental  <input checked="" type="checkbox"/> Irritant 			
Storage precautions	Store away from strong oxidizing agents and elevated temperature. Keep container tightly closed		
Transport precautions	Not classified as dangerous for transport		
Manual Handling precautions	As per standard manual handling procedures		
Factors which increase risks	Avoid extreme heat, strong oxidizers and sources of ignition		
Name, address and telephone number of supplier of substance:			
Solent Lubricants, Osbourne Works, Leicester, England, LE18 1AT, +			
<b>HARMFUL EXPOSURE ROUTES (tick relevant options)</b>			
Eye Contact	<input checked="" type="checkbox"/>	Ingestion	<input checked="" type="checkbox"/>
Skin Contact	<input checked="" type="checkbox"/>	Skin Absorption	<input type="checkbox"/>
Inhalation	<input checked="" type="checkbox"/>	Injection / sharps	<input type="checkbox"/>
Symptoms of over exposure	Mild inflammation and irritation of skin		
Personal protective equipment: (state type and when to be worn)			
<input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Hi Visibility Clothing <input checked="" type="checkbox"/> Safety Boots <input checked="" type="checkbox"/> Overalls <input checked="" type="checkbox"/> Gloves <input checked="" type="checkbox"/> Safety Goggles			
Notes:			

## EMERGENCY ACTIONS



# COSHH Assessment Form











Emergency action: first aid	Eye Contact AFlush eyes with water. Skin Contact AIf burned by hot material, cool skin with large amounts of water. Wash exposed skin with mild soap and water. Ingestion ARinse out mouth with water but DO NOT induce vomiting.
Emergency action: fire	Use dry chemical, foam, CO2 or water fog extinguishers. Combustion may cause toxic gases to be released.
Emergency action: spillage	Absorb spilt material with earth, sand etc and place in waste containers. Prevent area into waterways.
Disposal precautions:	Disposal in line with local regulations for hazardous material.
Emergency action: contact person	R. Ayres – HSEQ Manager Tel: 9

<b>Authorized by</b>		<b>Date approved</b>	15 <sup>th</sup> July 2013
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# COSHH Assessment Form











COSHH Assessment Number	BTL 114		
Product/Substance Name(s)	Bentonite Clay		
Uses	Stabiliser when constructing diaphragm walls or drilling large diameter piles		
Risks to health:	<input type="checkbox"/> Flammable  <input type="checkbox"/> Harmful  <input type="checkbox"/> Biohazard  <input type="checkbox"/> Corrosive  <input type="checkbox"/> Oxidising  <input type="checkbox"/> Toxic  <input type="checkbox"/> Environmental  <input checked="" type="checkbox"/> Irritant 		
Storage precautions	Store in dry conditions – slippery when wet		
Transport precautions	Classified as not dangerous. Transport in packaging supplied. Avoid dust creation		
Manual Handling precautions	As per standard manual handling procedures		
Factors which increase risks	Use in well ventilated areas and do not breath for long periods. Product becomes slippery when wet, do not allow to spill onto floor or footpath		
Name, address and telephone number of supplier of substance:			
Tolsa UK Ltd, Westcarr Road, Retford, Nottinghamshire, DN22 7ZF, +			
<b>HARMFUL EXPOSURE ROUTES (tick relevant options)</b>			
Eye Contact	<input checked="" type="checkbox"/>	Ingestion	<input checked="" type="checkbox"/>
Skin Contact	<input type="checkbox"/>	Skin Absorption	<input type="checkbox"/>
Inhalation	<input checked="" type="checkbox"/>	Injection / sharps	<input type="checkbox"/>
Symptoms of over exposure	No short term toxicology issues. Long term may cause fibrosis or silicosis if exposure is long term and over the WEL		
Personal protective equipment: (state type and when to be worn)			
<input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Hi Visibility Clothing <input checked="" type="checkbox"/> Safety Boots <input checked="" type="checkbox"/> Overalls <input checked="" type="checkbox"/> Gloves <input checked="" type="checkbox"/> Safety Goggles			
Notes: Wear dust mask when handling material			

<b>EMERGENCY ACTIONS</b>	
Emergency action: first aid	Skin and eye contact – wash out with clean water. Inhalation – move to fresh air. Ingestion – drink several glasses of milk or water. If symptoms persist seek medical help.
Emergency action: fire	No flammable but beware becomes very slippery when wet.
Emergency action: spillage	Sweep up if in powder form, if wet mix with absorbent material, collect up and dispose of as non-toxic waste
Disposal precautions:	Dispose of in accordance with local and national regulations using an approved disposal contractor.
Emergency action: contact person	R. Ayres – HSEQ Manager

<b>Authorized by</b>		<b>Date approved</b>	15 <sup>th</sup> July 2013
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# COSHH Assessment Form



COSHH Assessment Number	BTL 126		
Product/Substance Name(s)	Bentocryl 86		
Uses	Absorbing medium for technical applications		
Risks to health:			
<input type="checkbox"/> Flammable		<input type="checkbox"/> Harmful	
<input type="checkbox"/> Oxidising		<input type="checkbox"/> Toxic	
<input type="checkbox"/> Biohazard		<input checked="" type="checkbox"/> Environmental	
<input type="checkbox"/> Corrosive		<input checked="" type="checkbox"/> Irritant	
Storage precautions	Store between 5-35C (perishable if frozen). Keep tightly closed in a dry and cool place.		
Transport precautions	Not classified as dangerous for transport		
Manual Handling precautions	As per standard manual handling procedures		
Factors which increase risks	Addition of carbon monoxide		
Name, address and telephone number of supplier of substance:			
Süd-Chemie (UK) Ltd, 3 Drake Mews, Gadbrook Park, Northwich, Cheshire, CW9 7XF,			
<b>HARMFUL EXPOSURE ROUTES (tick relevant options)</b>			
Eye Contact	<input checked="" type="checkbox"/>	Ingestion	<input type="checkbox"/>
Skin Contact	<input checked="" type="checkbox"/>	Skin Absorption	<input type="checkbox"/>
Inhalation	<input checked="" type="checkbox"/>	Injection / sharps	<input type="checkbox"/>
Symptoms of over exposure			
Personal protective equipment: (state type and when to be worn)			
<input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Hi Visibility Clothing <input checked="" type="checkbox"/> Safety Boots <input checked="" type="checkbox"/> Overalls <input checked="" type="checkbox"/> Gloves <input checked="" type="checkbox"/> Safety Goggles			
Notes: Chemical resistant protective gloves			

# COSHH Assessment Form



EMERGENCY ACTIONS	
Emergency action: first aid	Eye Contact - Rinse immediately with plenty of water for approx 15 mins. Skin Contact - Wash off with soap and plenty of water. Inhalation - call a physician immediately.
Emergency action: fire	Standard procedure for chemical fires - water spray, CO2, dry powder, foam, water. Do NOT use a solid water stream as it may scatter and spread the fire.
Emergency action: spillage	Soak up with inert absorbent material (e.g. sand, silica gel, universal binder, sawdust). Beware of sliding risk when product in connection with water.
Disposal precautions:	Dispose collected material in accordance to prescription. Empty containers can be re-used after emptying and cleaning.
Emergency action: contact person	R. Ayres – HSEQ Manager Tel:

<b>Authorized by</b>		<b>Date approved</b>	15 <sup>th</sup> July 2013
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Page No.21

Date: 25.05.17

Contract Title: NORTH YORKSHIRE POLYHALITE  
PROJECT – WOODSMITH MINE

Made By:  
AK

Checked by:  
JAG

Work Scope: Operation of slurry plant

## ***APPENDIX F – PLANT REGISTER***

## NORTH YORKSHIRE POLYHALITE PROJECT - GUIDE WALL AND DIAPHRAGM WALL WORKS

### Plant register (environmental)

Author: JAG  
 Update: 26-May-17  
 Stage: Pre-construction phase

Notes: *The listed plant is indicative and may change due to operational requirements and available types of equipment at the time of construction.  
 The shown durations are indicative / based on the latest time schedule and may change.*

Construction phase	Activity ID	Activity	Location	Plant	Numbers	Type	Sound power level LWA [db(A)]	Sound pressure level LpA [db(A)]	Power rating [kW]	% on-time	Start	Finish	24 hour working	Comments
Mobilisation	MOB	Delivery and assembly of plant	Entire work area	Desander (incl.) desilter	4	MAT BE 250	104	84	59	10	04 June 2017	30 June 2017	Yes	
Mobilisation	MOB	Delivery and assembly of plant	Entire work area	Desander (incl.) desilter	2	MAT BE 275	92	72	73	10	04 June 2017	30 June 2017	Yes	
Mobilisation	MOB	Delivery and assembly of plant	Entire work area	Slurry pumps	12	Various	85	80	25	10	04 June 2017	30 June 2017	Yes	Estimated average values
Mobilisation	MOB	Delivery and assembly of plant	Entire work area	Dry silo	3	Euromix 20t	n/a	n/a	2	20	04 June 2017	30 June 2017	Yes	
Mobilisation	MOB	Delivery and assembly of plant	Entire work area	Slurry Tank	8	500m3 Bauer silo	n/a	n/a	5	20	04 June 2017	30 June 2017	Yes	
Mobilisation	MOB	Delivery and assembly of plant	Entire work area	Slurry mixer	3	SK 11/15	n/a	n/a	30	75	04 June 2017	30 June 2017	Yes	
Mobilisation	MOB	Delivery and assembly of plant	Entire work area	Screw feed	3	Bauer	n/a	n/a	8	75	04 June 2017	30 June 2017	Yes	
Mobilisation	MOB	Delivery and assembly of plant	Entire work area	Water tank	3	MAT, 3m3	n/a	n/a	3	75	04 June 2017	30 June 2017	Yes	
Mobilisation	MOB	Delivery and assembly of plant	Entire work area	Slurry agitation tank	3	MAT, 3m3	n/a	n/a	3	75	04 June 2017	30 June 2017	Yes	
Diaphragm wall construction	D-WALL	Construction of diaphragm walls	Entire work area	Desander (incl.) desilter	4	MAT BE 250	104	84	59	90	03 July 2017	26 January 2018	Yes	
Diaphragm wall construction	D-WALL	Construction of diaphragm walls	Entire work area	Desander (incl.) desilter	2	MAT BE 275	92	72	73	90	03 July 2017	26 January 2018	Yes	
Diaphragm wall construction	D-WALL	Construction of diaphragm walls	Entire work area	Slurry pumps	12	Various	85	80	25	90	03 July 2017	26 January 2018	Yes	Estimated average values
Diaphragm wall construction	D-WALL	Construction of diaphragm walls	Entire work area	Dry silo	3	Euromix 20t	n/a	n/a	2	90	03 July 2017	26 January 2018	Yes	
Diaphragm wall construction	D-WALL	Construction of diaphragm walls	Entire work area	Slurry Tank	8	500m3 Bauer silo	n/a	n/a	5	90	03 July 2017	26 January 2018	Yes	
Diaphragm wall construction	D-WALL	Construction of diaphragm walls	Entire work area	Slurry mixer	3	SK 11/15	n/a	n/a	30	90	03 July 2017	26 January 2018	Yes	
Diaphragm wall construction	D-WALL	Construction of diaphragm walls	Entire work area	Screw feed	3	Bauer	n/a	n/a	8	90	03 July 2017	26 January 2018	Yes	
Diaphragm wall construction	D-WALL	Construction of diaphragm walls	Entire work area	Water tank	3	MAT, 3m3	n/a	n/a	3	90	03 July 2017	26 January 2018	Yes	
Diaphragm wall construction	D-WALL	Construction of diaphragm walls	Entire work area	Slurry agitation tank	3	MAT, 3m3	n/a	n/a	3	90	03 July 2017	26 January 2018	Yes	
Demobilisation	DEMOB	Disassembly & collection of plant	Entire work area	Desander (incl.) desilter	4	MAT BE 250	104	84	59	10	29 January 2018	23 February 2018	Yes	
Demobilisation	DEMOB	Disassembly & collection of plant	Entire work area	Desander (incl.) desilter	2	MAT BE 275	92	72	73	10	29 January 2018	23 February 2018	Yes	
Demobilisation	DEMOB	Disassembly & collection of plant	Entire work area	Slurry pumps	12	Various	85	80	25	10	29 January 2018	23 February 2018	Yes	Estimated average values



## NORTH YORKSHIRE POLYHALITE PROJECT - GUIDE WALL AND DIAPHRAGM WALL WORKS

### Plant register (environmental)

Author: JAG  
Update: 26-May-17  
Stage: Pre-construction phase

Notes: *The listed plant is indicative and may change due to operational requirements and available types of equipment at the time of construction.  
The shown durations are indicative / based on the latest time schedule and may change.*

Construction phase	Activity ID	Activity	Location	Plant	Numbers	Type	Sound power level LWA [db(A)]	Sound pressure level LpA [db(A)]	Power rating [kW]	% on-time	Start	Finish	24 hour working	Comments
Demobilisation	DEMOB	Disassembly & collection of plant	Entire work area	Dry silo	3	Euromix 20t	n/a	n/a	2	20	29 January 2018	23 February 2018	Yes	
Demobilisation	DEMOB	Disassembly & collection of plant	Entire work area	Slurry Tank	8	500m3 Bauer silo	n/a	n/a	5	20	29 January 2018	23 February 2018	Yes	
Demobilisation	DEMOB	Disassembly & collection of plant	Entire work area	Slurry mixer	3	SK 11/15	n/a	n/a	30	75	29 January 2018	23 February 2018	Yes	
Demobilisation	DEMOB	Disassembly & collection of plant	Entire work area	Screw feed	3	Bauer	n/a	n/a	8	75	29 January 2018	23 February 2018	Yes	
Demobilisation	DEMOB	Disassembly & collection of plant	Entire work area	Water tank	3	MAT, 3m3	n/a	n/a	3	75	29 January 2018	23 February 2018	Yes	
Demobilisation	DEMOB	Disassembly & collection of plant	Entire work area	Slurry agitation tank	3	MAT, 3m3	n/a	n/a	3	75	29 January 2018	23 February 2018	Yes	



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Page No.22

Date: 25.05.17

Contract Title: NORTH YORKSHIRE POLYHALITE  
PROJECT – WOODSMITH MINE

Made By:  
AK

Checked by:  
JAG

Work Scope: Operation of slurry plant

## ***APPENDIX G – LABOUR HISTOGRAM***



**NORTH YORKSHIRE POLYHALITE PROJECT - GUIDE WALL AND DIAPHRAGM WALL WORKS**

**Personnel histogram**

Author: JAG  
 Update: 16-May-17  
 Stage: Pre-construction phase

Notes: *The listed numbers are indicative and may change due to operational requirements and final construction programme.  
 Percentage of local labour is likely to be <5% as the availability of local skilled diaphragm wall operatives is very limited  
 Day shift working hours: 07am - 07pm, start Monday morning at 07am.  
 Night shift working hours: 07pm - 07am, finish Saturday morning at 07am.  
 If instructed, diaphragm wall construction working hours may be extended to 24/7 working.*

Construction phase	Activity ID	Month	Site Management (DAYSHIFT)	Site Management (NIGHTSHIFT)	Site Operatives (DAYSHIFT)	Site Operatives (NIGHTSHIFT)	Suppliers / subcontractors (DAYSHIFT)	Suppliers / subcontractors (NIGHTSHIFT)	Total (DAYSHIFT)	Total (NIGHTSHIFT)	TOTAL
Mobilisation	MOB	Jul-17	6	4	15	15	15	0	36	19	55
Diaphragm wall construction	D-WALL	Aug-17	10	4	35	35	2	2	47	41	88
Diaphragm wall construction	D-WALL	Sep-17	10	4	35	35	2	2	47	41	88
Diaphragm wall construction	D-WALL	Oct-17	10	4	35	35	2	2	47	41	88
Diaphragm wall construction	D-WALL	Nov-17	10	4	35	35	2	2	47	41	88
Diaphragm wall construction	D-WALL	Dec-17	10	4	35	35	2	2	47	41	88
Diaphragm wall construction	D-WALL	Jan-18	10	4	35	35	2	2	47	41	88
Diaphragm wall construction	D-WALL	Feb-18	10	4	35	35	2	2	47	41	88
Diaphragm wall construction	D-WALL	Mar-18	10	4	35	35	2	2	47	41	88