

SERVICING CONSTRUCTION SINCE 1937'

Report No. 2401-001/R/003 24 April 2025 Revision 2

Gransmoor Wet Processing Plant

Permit Application Site Condition Report

HOOPER-SARGENT LIMITED

Environmental Permitting Consultancy



Document Control

Document: Permit Application Site Condition Report

Project: Gransmoor Wet Processing Plant

Client: W. CLIFFORD WATTS LTD

Report Number: 2401-001/R/003

Document Checking:

Revision	Revision/ Review Date	Details of Issue	Prepared / Authorised
2	24 April 2025	Response to EA request for pre-Duly Making information	Phillip Roberts
1	17 June 2024	Issued for application	Phillip Roberts
0	5 April 2024	Issued for Client review	Phillip Roberts

This report has been produced by Hooper-Sargent Limited within the terms of the contract with the client and taking account of the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Please note that this report is based on specific information, instructions, and information from our Client and should not be relied upon by third parties. The copyright of this report remains the property of Hooper-Sargent Limited and cannot be reproduced in whole or in part without first obtaining the express consent of Hooper-Sargent Limited.



Contents

1	Intro	duction	3
	1.1	Requirement for a Site Condition Report	3
	1.2	Purpose of SCR	3
	1.3	Structure of SCR	4
2	SCR S	Section 1.0: Site Details	5
3	SCR S	Section 2.0: Condition of Land at Permit Issue	6
4	SCR S	Section 3.0: Permitted Activities	2
5	SCR S	Section 4.0: Changes to the Activity1	3
AP Inf	PENDIX	A – MJCA Carters report referenced WCW/YO /CEW/2607/01 Dated June 2007 – Part 1 Baseline	A
AP	PENDIX	(B – MJCA Carters Borehole Logs and Location Plan	В
AP	PENDIX	C – MSDS Sheet for Clearflo Flocculent	С

1 Introduction

1.1 Requirement for a Site Condition Report

This Site Condition Report (SCR) has been prepared in support of a variation to permit referenced EPR/GP3292ZU operated by W. Clifford Watts Limited (Clifford Watts, the Operator). Permit application form Part C2, Question 5b states that if additional land is to be included within the permit, then a Site Report must be provided for the extra land. There is not a requirement to submit a SCR with an application for a SR2010No12 and it is understood none have been prepared.

The original permit for the site was issued on 31 March 2005. It was subsequently varied on 18th May 2011 to a new style environmental permit with revised conditions. This included Condition 1.1.1(a) which states:

"The operator shall manage and operate the activities:

in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, nonconformances, closure and those drawn to the attention of the operator as a result of complaints;"

Environment Agency (Agency) Regulatory Guidance Note RGN9, Paragraph A9 states that:

When operators apply to surrender these permits [those permitted before 6 April 2008], the Core guidance states that we should not hold the operator responsible (under Environmental Permitting surrender requirements) for contamination on the site that we are convinced was caused before the facility was first licensed under the Environmental Protection Act 1990 or under Part I of the Control of Pollution Act 1974.

RGN9 Paragraph A10 states:

The Core guidance also states that we should only consider contamination arising from the handling of waste.

This SCR will therefore take due consideration of any potential contamination which may have occurred prior to the permit's issue in 31 March 2005. It will also focus only on potential sources of contamination associated with the handling of waste. It will also assume the Operator will run the facility with the intention of minimising the risk of pollution throughout the lifetime of the site by maintaining an effective management system.

1.2 Purpose of SCR

This SCR will function as an Application SCR in accordance with Section 3.0 of the Agency's Horizontal Guidance H5: Site Condition Report – Guidance and Templates.

The Operator appreciates that it is in their interests to produce an SCR to characterise the baseline condition of the ground and groundwater at the site prior to issue of the proposed bespoke permit. This will assist the eventual surrender of the permit by demonstrating that the land has been protected at its baseline condition during the operational lifetime of the site and that it has been returned to a satisfactory state on completion of operations. In the unlikely event that contamination was to occur, the SCR will assist the Operator in identifying the source, location and extent of any contamination and provide a framework for its remediation prior to approval of a permit surrender application.

1.3 Structure of SCR

This SCR will be structured around the following components in accordance with the Agency H5 SCR Template:

- Section 1.0: Site Details
- Section 2.0: Condition of the Land at Permit Issue
- Section 3.0: Permitted Activities

Section 3.4 of the Agency SCR Guidance (activities that are not IPPC or IED Installations) recommends that samples be taken of the soil or groundwater to measure levels of contamination where:

- there is evidence or suspicion of existing contamination;
- an environmental risk assessment identifies operations at site may give rise to emissions involving the same type of contaminants as historic activities
- There is a potential pathway which such emissions could be released to land or groundwater.

The Agency may consider that it is not essential to take samples of soil or groundwater for levels of contamination where an environmental risk assessment identifies no or limited hazards to land or groundwater; and, there is no reason to believe historical contamination by substances which could present a hazard. It may also not be essential if there are hazards to land or groundwater but there is evidence that there is no historical contamination by those substances which present a hazard.

There was no requirement to carry out an SCR to support the permit application for the SR2010No.12 as the activities and wastes imported for storage and treatment under it are not considered to present a risk. The accompanying Technical Standards document referenced 2401-001/R/002 provides a detailed description of the existing and proposed waste activities on Site. It also details the appropriate measures to prevent pollution or control it to acceptable levels, particularly where the proposed activities deviate from the assumptions of the SR2010No12 generic risk assessment, which has since been superseded by SR2022No1 and associated risk assessments. The Environmental Risk Assessment (ERA) referenced 2401-001/R/004 which accompanies this application is based on the Technical Standards report and informs this SCR. The ERA includes reference to water sampling data collected from the site which is proposed to act as a baseline.



2 SCR Section 1.0: Site Details

1.0 Site Details	
Name of Applicant	W. Clifford Watts Limited
Activity Address	Gransmoor Quarry (Site B)
	Gransmoor Lane
	Harpham
	East Yorkshire
	YO25 8HZ
National Grid Reference	TA 11844 59965

Document reference and dates for Site	Date of SR2010No12 Application: SCR not applicable
Condition Report at permit application and	Variation application to bespoke permit: 2401-001/R/003 dated 17
surrender	June 2024
	Revision dated 24 April 2025 to original 17 June 2024 application
	documents to address pre-duly making questions
	Surrender: TBC

Document references for site plans	Permit Application Report referenced 2401-001/R/001
(including location and boundaries)	



3 SCR Section 2.0: Condition of Land at Permit Issue

2.0 Condition of Land at Permit Issue		
Environmental setting including:	Geology	
GeologyHydrogeologySurface waters	The following description of the geology at the site is taken from MJCA Carters report referenced WCW/YO/CEW/2607/01 Dated June 2007 – Part 1 Baseline Information attached in Appendix A. The report concerned the baseline conditions of the proposed northern extension to the quarry. The generic descriptions of the geology are considered to be representative of the conditions beneath the application site which is just south of the extension areas southern boundary. Location specific information gained from borehole logs located further north and within the extension area may not be representative of the application site.	
	The MJCA report reviewed geological information available from the British Geological Survey (BGS) 1:50,000 scale provisional series Sheet 64 Great Driffield Solid and Drift Edition and the BGS 1:100,000 Hydrogeological Map of East Yorkshire, together with logs from 4 groundwater monitoring boreholes and 17 mineral proving boreholes.	
	The geology of the extension was described as "Quaternary glacial deposits and alluvium overlying the cretaceous chalk. The chalk comprises a marly fine- grained limestone. Based on the geological map the chalk is approximately 450 m thick in the vicinity of the site.	
	From the geological map the Quaternary glacial deposits in the vicinity of the extension comprise till and Glaciofluvial Ice-Contact Deposits. The groundwater monitoring boreholes were terminated in the chalk at a depth between 16.7 m and 18 m below ground level which is equivalent to approximately 9.7 m below Ordnance Datum (mBOD) and 9.25 mBOD.	
	The mineral proving boreholes which were installed in the area of the ridge were terminated at a depth between 7 m and 10 m below ground level which is equivalent to approximately 6 m Above Ordnance Datum (mAOD) and 3 mAOD. The base of the drift deposits at the extension is between approximately 8.25 mBOD and 9.6 mBOD. The low sinuous ridge at the extension comprises Glaciofluvial Ice-contact deposits. The Ice Contact Deposit is shown on the geological map surrounded by alluvium. The alluvium is underlain by till. The extension will be excavated into quaternary glacial deposits and alluvium. The glacial deposits comprise generally a sequence of gravely or sandy gravely clay, silt or gravely silt.	
	BGS Sheet 64 Great Driffield Solid and Drift Edition is available online ¹ and covers both the extension area and the application Site. The BGS map indicates that the application site is primarily underlain by Alluvium (western extent of current / proposed permit boundary) and a combination of Glaciofluvial Ice-contact deposits and Alluvium in the eastern extent. As with the extension area the BGS map indicates that the Ice-Contact deposits are underlain by till. It is considered likely that a comparable depth of chalk underlies the application area to that described for the extension area. It is assumed that the description of the quaternary glacial deposits and alluvium	

¹ British Geological Survey (BGS) | large image viewer | IIPMooViewer 2.0

provided by MJCA is based on the logs of boreholes installed for the extension and a similar description applies to the application site (Appendix B).

The estimated position of BH1 based on the plan provided with the MJCA report is approximately 20 m northwest of the proposed Wet Process Plant (WPP) settlement lagoons and approximately 50 m west of the closest component of the WPP itself. BH4 is estimated to be approximately 150 m east of the WPP.

The installation log for BH1 describes 0.7 m of topsoil above 3.2 m of sandy and slightly gravelly silt, under which is 1.5 m of slightly sandy, slightly gravelly clay. Below that is a 0.5 m thick band of sand and gravel and below that is 5.7 m of clay. There are then chalk gravel and silt until the chalk is encountered 16 mbgl. The installation log for BH4 describes 1.8 m of topsoil underlain by 1.2m of slightly sandy, slight gravelly clay. Beneath the clay are further alternating bands of gravel and clay before the chalk is encountered 16 mbgl.

Hydrogeology

The 1980 BGS Hydrogeological map of East Yorkshire² indicates a groundwater flow in the chalk underlying the site to be toward the southeast. The map indicates that the top of the chalk in the vicinity of the site is at 10 mBOD with a water level of 10 mAOD indicating the water in the chalk is in continuity with the drift deposits, but confined by the layer of clay in the vicinity of BH1.

The Environment Agency has designated the chalk bedrock as a Principal Aquifer and describe Principal Aquifers as "*Principal and secondary aquifers provide significant quantities of drinking water, and water for business needs.* They may also support rivers, lakes and wetlands."³

The Superficial Drift Deposits underlying the site are designated as Secondary A Aquifers which means "secondary A aquifers comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers".

The MJCA report describes water being struck in the superficial deposits of all 4 groundwater boreholes during installation with water levels measured between 1.54 mBOD and 3.75 mAOD during 2006. No new data is available for these monitoring points. The MJCA report inferred a hydraulic gradient in the superficial deposits toward the south of the extension area. MJCA suggested this was influenced by dewatering from the water in the quarry void south of the WPP which was maintained at approximately 5 mBOD. A more recent survey of the water level in the former quarry void recorded the water level between 1mBOD and 2 mBOD. In the absence of pumping MJCA suggested that water levels in the extension area would rise to between 3 mAOD and 7 mAOD may discharge through the permeable strata into the Gransmoor Drain located on the immediate western boundary of the Site. The invert level of the Gransmoor Drain is not available but the water level in the drain in 2020 was recorded at 5.14 mAOD. Assuming conservatively the invert is 3 mAOD the drain would have been excavated into the alluvial silts noted in BH1. This may act as a barrier to groundwater infiltration into the drain in the vicinity of that location i.e. downstream of the WPP.

² British Geological Survey (BGS) | large image viewer | IIPMooViewer 2.0

³ Protect groundwater and prevent groundwater pollution - GOV.UK (www.gov.uk)



	The application site is not located within a Source Protection Zone (SPZ). The nearest SPZ is approximately 3.5 km to the north between Burton Agnes and Thornholme.
	Surface Waters
	The nearest static water feature to the application Site is the water in the base of the main Gransmoor Quarry void approximately 50 m south of the main WPP structure. As discussed in the Hydrogeology section above, this water is anticipated to be in continuity with the groundwater in the superficial deposits. A larger water body call Kelk Lake is located approximately 730 m northwest of the application Site. There are numerous small ponds located around the extension area associated with extraction voids filled with surface water or groundwater.
	The Gransmoor Drain flows north to south along the immediate western boundary of the site. The MJCA report states that it flows toward a confluence with the Burton Drain some 3 km east, southeast of the Application Site. The Burton Drain then flows into the Barmston Main Drain which outfalls into the North Sea approximately 6 km east, southeast of the application Site. Field drains to the east of the site also flow into the Gransmoor Drain near the site entrance off Kelk Lane.
	According to data from DEFRA ⁴ , the Gransmoor Drain (Burton Agnes to Lissett Area) is classified as having 'moderate' Ecological Status and 'moderate' Physico-chemical quality elements, but 'fails' due to the presence of Priority Hazardous Elements identified as mercury and Polybrominated diphenyl ethers (PBDE, a group of brominated flame retardants). It is noted from the DEFRA website that all waterbodies fail this status assumed to be due to the prevalence of certain substances. The reasons stated by DEFRA for the water course not achieving 'good' status were poor agricultural soil management, sewage discharge and agricultural land drainage. Quarrying and waste management activities were not stated as reasons for not achieving good status.
Pollution history including:	Pollution Incidents
 pollution incidents that may have affected land historical land-uses and associated contaminants any visual/olfactory evidence 	The Operator has advised that no pollution incidents have occurred within the current and proposed permit boundary. A review of the Agency Environmental Pollution Incidents (Category 1 and 2) register ⁵ did not identify any Category 1, 2, 3 or 4 Incidents within the vicinity
of existing contamination	of the national grid reference for the site.
 evidence of damage to pollution prevention 	Historical land-uses and associated contaminants
measures	Historical maps available online and Google Earth images have been reviewed to establish the history of site use and other potential sources of contamination that pre-date the proposed activities.
	1840s to 1880s

⁴ Gransmoor Drain (Burton Agnes to Lissett Area) | Catchment Data Explorer | Catchment Data Explorer

⁵ Environmental Pollution Incidents (Category 1 and 2) - data.gov.uk



Ordnance Survey mapping dated from the 1840s to the 1880s⁶ shows the presence of Thornham Hill occupying the approximate area of the water filled void at site to the south of the current permit boundary. The crest of the hill is shown to be 50 feet (15 m) above Ordnance Datum. The presence of a sand pit is noted at the northern extent of the hill. The surrounding area is characterised as agricultural. The Gransmoor Drain appears to be known as the Barf Dike at that time and follows the same course along the western boundary of the Site. A footpath crosses the site.

1888 to 1915

The Site is relatively unchanged with Thornham Hill still present.

1931 to 1938

A land utilisation survey shows the site to be meadowland and permanent grass.

1937 to 1961

A track is evident running northwards through the site. Map symbols suggest quarrying is more extensive through the length of the site. The crest of the hill is still shown to be 50 feet above ordnance datum.

Google Earth Aerial Photograph 2002

The earliest available Google Eart image shows no evident development of the land where the WPP is currently located i.e. to the west of the current permit boundary. An access road demarks the southern permit boundary and various items of plant or containers have been placed on the verge to the north of it. In the eastern part of the permit boundary appears to be various stockpiles of material. A screen and feed hopper are located centrally to this area.

Two parallel access tracks run the length of the area proposed to be included in the permit boundary to the south. Various stockpiles of minerals or aggregates are located along them. A spur from the eastern track is evidently used to access the water in the former quarry void which runs the length of the site to the south of the current permitted area. Two pontoons are visible and are assumed to act as surface water extraction points for groundwater level management and use on site e.g. dust suppression.

Google Earth Aerial Photograph 2005

The previously undeveloped land to the west has been largely stripped of topsoil. It is not possible to distinguish from the photograph which area s have been subject to mineral extraction or placement of stockpiles (or both). Various items of plant or similar items have been placed along the western boundary. A channel appears to have been cut in the northwest corner of the current permit boundary area. This does not appear to connect with the adjacent Gransmoor Drain. Material appears to have been deposited on the western extent of the proposed extension to the permit boundary.

Google Earth Aerial Photograph 2007

⁶ Georeferenced Maps - Map images - National Library of Scotland (nls.uk)



	The area southeast of the channel cut in the northwest corner of the site has standing water in it. The channel is no longer visible.
	Google Earth Aerial Photograph 2011
	The area of standing water noted on the 2007 image appears to have been shaped up to two long lagoons separated by a central causeway. There is no separation at the northern end of the lagoons however. The WPP currently on site appears to have been constructed in its present position.
	Google Earth Aerial Photograph 2019
	The lagoons to the west are now separated into 3 discrete lagoons with a causeway extending the entire length of them. The WPP thickening tank and water storage silos have been constructed to the immediate east of the lagoons. A compound with two bays has been constructed south of the desilting plant. An assortment of heavy plant is parked north of the silos. The quarry has begun expansion into the area to the northeast of site.
	Google Earth Aerial Photograph 2021
	The northern extension to the quarry has been developed fully with quarrying activities evident across most of the area. Numerous lagoons are present. A triangular concrete slab has been constructed for the second WPP to the north of the plant located in the permitted area.
	Google Earth Aerial Photograph 2022
	Construction of the second WPP is ongoing. The aggregate storage compound south of the WPP silos has been converted from 2 bays to 3 bays.
	Google Earth Aerial Photograph 2023
	A steel framed building is being constructed on the western boundary of the proposed permit extension area.
	Visual / olfactory evident of existing contamination
	The Operator has reported no visual / olfactory evidence of existing contamination at the site.
	Evidence of damage to pollution control measures
	The Operator has reported no damage to pollution control measures associated with the waste and non-waste activities carried out at the site.
Evidence of historic contamination, for example, historical site investigation,	No site investigations have been undertaken within the existing or proposed permit boundary. Prior to the issue of the SR2010 No12 the area had only been operated as a quarry.
verification reports (where	Historical and Permitted Landfill Sites
available)	The Operator is the permit holder for two closed landfill sites:
	 DP3599ZJ: A5 - Landfill taking Non-Biodegradeable Wastes QP3599ZF: A5 - Landfill taking Non-Biodegradeable Wastes



	These landfills would be considered as inert by contemporary description but were not subject to the requirements of the Landfill Directive and associated annexes at time of operation. The extent of the permit boundary of each site is to be confirmed but it is understood the waste deposits for DP3599ZJ occupy land to the east of the WPP and the deposits for QP3599ZF occupy land to be included in the extended permit boundary to the south.
Baseline soil and groundwater reference data	The Operator collects surface water quality data on a quarterly basis. This is held electronically by the Operator at their main office. The MJCA report provides the most representative baseline data for the site as the groundwater boreholes installed as part of that project are likely to be up- hydraulic gradient of the current and proposed permit boundary. A copy of the report is held in paper form and electronically by the Operator at their head office.
Supporting information	Appendix A - MJCA Carters report referenced WCW/YO/CEW/2607/01 Dated June 2007 – Part 1 Baseline Information Appendix B - MJCA Carters borehole logs and location plan Appendix C – MSDS Sheet Clearflo Flocculent



4 SCR Section 3.0: Permitted Activities

3.0 Permitted activities		
Permitted activities	Table 2.1 Activities of SR201No12	
	Description of Activities	
	R13: Storage of wastes pending the operations numbered R3 and R5	
	R3: recycling or reclamation of organic substances which are not used as solvents	
	R5: Recycling or reclamation of other organic substances	
	Limits of Activities	
	Treatment of wastes listed in table 2.3 consisting only of sorting, separation, screening, crushing and blending of waste for recovery as a soil, soil substitute or aggregate.	
	Secure storage of wastes listed in table 2.3 pending treatment.	
	Storage of wastes listed in table 2.4 shall not exceed 10,000 tonnes in total at any one time.	
	All other wastes stored shall not exceed 40,000 tonnes in total at any one time.	
	No more than 75,000 tonnes of waste shall be treated per year.	
	Treatment of slags and ashes for disposal shall not exceed 50 tonnes per day, or if for a mix of recovery and disposal shall not exceed 75 tonnes per day.	
Non-permitted activities undertaken	No exempt activities carried out within the permit boundary.	
Document references for:	Activity Layout: Technical Standards Report referenced 2401- 001/R/002 rev 2	
 environmental risk assessment 	Environmental Risk Assessment: report referenced 2401-001/R/004 rev 2	

W Clifford Watts

SERVICING CONSTRUCTION SINCE 1937

4.0 Changes to the Activity		
Have there been any changes to the permit boundary?	See drawing referenced 2401-001/D/001	
Have there been any changes to the permitted activities	Addition of Physico-Chemical Treatment to Table 2.1.	
	Increase annual throughput to 250,000 tonnes (as per SR2022No1)	
	Addition of EWC code 19 02 06	
	Clarification that up to 75,000 tonnes of waste from Table 2.3b of SR2022No1 (no limit on use of 17 05 04 from Table 2.3b) will be processed to produce soil per annum	
	Wet processing of waste soils as an R5 activity is added to limits of activity.	
	Increase permit boundary to extend into southern area of the site.	
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or	No dangerous substances are used in the waste treatment process. The flocculent is the only additive and that does not have any dangerous properties. A copy of the MSDS sheet is attached in Appendix C. Diesel	
produced as a result of the permitted activities?	fuel is used to power the generator that runs the wet process plant.	
Checklist of supporting information	Permit Boundary Plan:	
	Description of changes to permitted activities: Application Report referenced 2401-001/R/001 rev 2	



APPENDIX A – MJCA Carters report referenced WCW/YO /CEW/2607/01 Dated June 2007 – Part 1 Baseline Information PART I

BASELINE INFORMATION

WCW/YO/CEW/2607/01 June 2007 MJCA

Pl9165final

3. Site location and description

- 3.1 Gransmoor Quarry is located approximately 8.5km to the east north east of Driffield and approximately 2.9km south south east of Burton Agnes in the County of East Riding of Yorkshire. The extension is centred on National Grid Reference (NGR) TA 112 598 to the north of the current Gransmoor Quarry.
- 3.2 Highway access is from the unclassified Gransmoor to Great Kelk Road which runs approximately east to west immediately south of the current Gransmoor Quarry (Figure 1). To the east of the site access the unclassified road is known as Kelk Lane. Kelk Lane joins an unclassified road which runs generally north north west to south south east and meets the A614 to the north and the A165 to the south. To the west of the site access the unclassified road is known as Gransmoor Lane. Gransmoor Lane joins an unclassified road which runs generally north north west to south south east which passes through Lowthorpe and meets the A614. The site entrance is located to the south south east of the surrounding highway network together with the current access routing and traffic considerations relating to the site is provided in Section 5.
- **3.3** The access road from the public highway runs in a north west to south east direction for approximately 200m to the site reception area which is located adjacent to and east of the south eastern corner of the current Gransmoor Quarry. The access road from the public highway to the site reception area is surfaced with concrete. From the site reception area the internal site haul road which has a compacted hardcore surface runs in a generally northerly direction to a point adjacent to the north eastern corner of the current Gransmoor Quarry where the road forks providing access to the current Gransmoor Quarry and to the current recycling area.
- 3.4 The area of the proposed extraction comprises approximately 6.69ha of generally low-lying land. The edge of the proposed extraction is at a level of approximately 7m Above Ordnance Datum (mAOD). A low ridge crosses the site from the south east corner to the north west corner in a northerly then westerly direction. The ridge rises to a maximum level of approximately 12.95mAOD (Figure 3).

- 3.5 The extension is in an agricultural setting with isolated dwellings and woodland areas. Turtle Hill Wood is located adjacent to and north of the extension and there is agricultural land to the east and west of the site. Gransmoor Drain flows generally north to south to the west of the extension and between the extension and the agricultural land to the west. The inert waste recycling and the current Gransmoor Quarry are located to the south of the extension.
 - **3.6** The extension comprises a generally rectangular area of land in agricultural use. The application boundary includes a narrow strip extending south south westwards from the south western corner of the extension together with an area to the south of the arable land currently used for materials recycling and storage of inert waste and the access to the east of the current Gransmoor Quarry (Figure 3). The agricultural land comprises arable, semi improved grassland and improved grassland divided by hedges and post and wire fences. The current recycling area has been worked for sand and gravel and restored by landfilling with inert waste. Imported inert materials are crushed and screened in this area and materials are stockpiled.
 - **3.7** The site reception area comprises office buildings and a weighbridge. The current Gransmoor Quarry is located to the west and north west of the reception area. The current Gransmoor Quarry is being restored. Restoration is not complete in this area.
 - **3.8** A search was undertaken for underground and overhead services in the area of the extension. Based on the information received there are no electricity services, gas service pipelines, water or sewage pipelines, oil or fuel pipelines or telecommunications cables crossing the extension.

PI9165final

4. Population and public rights of way

- **4.1** The distribution of settlements and residential properties in the vicinity of the extension area has been examined as an indicator of population. The surrounding land generally is in agricultural use with scattered small settlements and frequent individual properties that often are adjacent to roads (Figures 1 and 2).
- **4.2** The settlement nearest to the extension is the village of Gransmoor which is located approximately 1.1km east south east of the extension. The dwellings in Gransmoor closest to the extension are at a distance of approximately 900m. The village of Great Kelk is located approximately 1.6km south south west of the extension. Other settlements in the area include Lissett approximately 3.1km to the south east, Gembling approximately 2.2km to the south, Lowthorpe approximately 2.6km to the west north west, Harpham approximately 2.3km to the north west and Burton Agnes approximately 2.9 km to the north north west. The town of Driffield lies approximately 8.5km west of the extension (Figure 1).
- 4.3 The property nearest to the extension is Turtle Hill Farm the closest buildings of which lie approximately 280m north east of the extension. Woodside Farm lies approximately 920m north east of the extension. Gransmoor Low House lies approximately 430m generally east of the extension. Houses to the west of Gransmoor village lie approximately 880m to 990m from the extension. Whitehall Farm lies approximately 720m west north west of the extension. A property located between Whitehall Farm and Little Kelk Cottage lies approximately 810m west north west of the extension. Properties at Little Kelk Farm lie approximately 940m north west of the extension. A property located to the north of Kelk lake lies approximately 630m north west of the extension. A row of dwellings along Main Street between Great Kelk and Little Kelk are between approximately 1.15km south west of the extension and 1.25km west of the extension.
- 4.4 The Definitive Map of Public Rights of Way for the area has been examined. There are no footpaths or bridleways within the area of the extension. There are five footpaths and bridleways within 1 km of the boundary of the extension (Figure 4).

- 4.5 Approximately 600m to the north east of the extension Public Bridleway 5 runs in a generally easterly direction on the boundary of Gransmoor Wood past Woodside Farm and White Lodge. Public Bridleway 4 lies to the south south west of the extension and runs in a generally south south easterly direction from Gransmoor Lane to Nutholmes Dike. Public Bridleway 3 located generally to the south west of the extension is at a distance of approximately 100m from the application boundary. Public Bridleway 3 runs in a westerly direction for a distance of approximately 550m before it turns south south easterly for a distance of approximately 600m to meet Gransmoor Lane.
- 4.6 Public footpath 2 lies approximately 540m from the western boundary of the extension and runs in a westerly direction to Westfield Cottages located adjacent to Main Street in Little Kelk. The footpath links to Public Bridleway 3. Public footpath 8 is located north of Whitehall Farm approximately 740m to the west north west of the extension and runs west for approximately 250m and then north for approximately 125m where it meets Moor Lane.

Pl9165final

5. The transport network and traffic movements

- 5.1 The baseline for the transport network and current vehicle movements has been established by an inspection of the local roads, reference to Ordnance Survey maps and a review of traffic flows associated with the operation of the current Gransmoor Quarry and Park House Farm Quarry. Discussions have been held with Street Scene. A transport statement is presented at Appendix B.
- 5.2 The site access is from Kelk Lane approximately 1.2km west of Gransmoor village. Approximately 0.7km to the east of the site access Kelk Lane joins an unclassified road which runs generally north north west to south south east and meets the A614 at Burton Agnes to the north and the A165 at Lissett to the south. The A614 runs generally north east to south west from Bridlington to Driffield. The A165 runs generally north south from Bridlington to the north to Kingston upon Hull to the south.
 - **5.3** The access road forms a bell mouth that is approximately 27m wide at Kelk Lane. It is understood from W. Clifford Watts Limited that there have been no accidents or incidents to date involving vehicles that were entering or leaving the current Gransmoor Quarry site.
 - 5.4 East Riding of Yorkshire Council advise that in the past local residents have expressed concern regarding the routing of Heavy Goods Vehicles (HGVs) along roads that are in places narrow with bends. Some disturbance particularly in the early mornings has been reported to the Planning Authority. A voluntary arrangement implemented by W. Clifford Watts Limited comprising a one way system for loaded and unloaded vehicles and a ban on articulated vehicles along certain roads has been successful in reducing complaints received relating to traffic from the quarries. As part of this arrangement no articulated vehicles unloaded or loaded travel through Lowthorpe. Vehicles leaving the current Gransmoor Quarry or Park House Farm Quarry travelling towards Driffield pass through Lowthorpe and return through Burton Agnes.

5.5 The traffic baseline survey is compiled from data provided by W. Clifford Watts Limited for traffic movements from the current Gransmoor Quarry and Park House Farm Quarry. The Park House Farm Quarry access is located approximately 700m to the west of the Gransmoor Quarry access on Gransmoor Lane. Traffic associated with the two sites use the same network of local roads. The traffic movements relating to mineral and waste activities are based on tonnage records of minerals exported from Park House Farm Quarry and waste inputs to and recycled aggregate exports from Gransmoor Quarry. The traffic flows are presented in Table 1. The current daily total vehicle traffic flow generated by Gransmoor Quarry and Park House Farm Quarry is approximately 84 vehicle movements 40 of which are HGVs associated with the mineral extraction operations at Park House Farm Quarry. An approximation of the number and distribution of HGVs generated by Park House Farm Quarry has been provided by W. Clifford Watts. 40% of vehicles travel through Lissett, 32% of vehicles travel through Lowthorpe and 28% of vehicles travel through Burton Agnes. Due to the remote rural location of the extension it is considered that public transport, cycling and walking are not practical or relevant modes of transport.

Pl9165final

6. Landscape and visibility

6.1 An assessment of the landscape in and round the extension together with an assessment of the current visibility of the extension has been prepared. The assessment is based on a desk study and the findings of visits to the site in November and December 2006. The landscape assessment was undertaken in accordance with current guidance provided by the Landscape Institute and the Institute of Environmental Management and Assessment together with the Countryside Agency⁶. The landscape and visual assessments are presented at Appendix C.

Landscape

- 6.2 At a regional level the extension lies in the countryside character area designated by the Countryside Agency as Holderness. The Holderness countryside character area is a generally flat or gently undulating landscape centred on the valley of the River Humber with terrain characteristic of a glacial history. Fields are predominantly large and tree and woodland cover is sparse creating a landscape that is open with long views. A line of soft clay cliffs separates the agricultural landscape from the North Sea. Variations in the character of the landscape result from small changes in topography, the level of tree cover and in the nature of settlement and landuse.
- 6.3 The valley of the River Hull is broad and shallow with little settlement except at the margins. Arable fields are dominant features except where there is pasture on clay soils. In the lower parts of the valley there are drained, fertile soils used to grow root crops, vegetables and cereals. Urban fringe influences affect the character round Hull where housing, industry, roads and pylons are prominent.
- 6.4 The local landscape character area in which the extension is located is defined as the Kelk Beck Farmland local landscape character area. The Kelk Beck Farmland local landscape character area is a subdivision of the Low Lying Drained Farmland character type. The Low Lying Drained Farmland character type is situated in the

⁶ The Countryside Agency now forms part of Natural England.

floodplain of the River Hull and the land is low lying and flat. There are numerous water bodies created as a result of sand and gravel extraction. The drift deposits comprise glacial till, sand and gravel together with river alluvium deposits. The River Hull has a strong influence on the landscape character and is fed by tributaries and man made channels. Settlements are distributed sparsely in open agricultural land and are concentrated round the edges of the character area. Sites of Special Specific Interest (SSSI) are common in the character area.

- 6.5 The local landscape character area Kelk Beck Farmland is well wooded and characteristically flat. The northern part of the character area is in the Yorkshire Wolds Area of High Landscape Value as designated in the East Yorkshire Borough Wide Local Plan. Linear drainage ditches flow from the east and west into Kelk Beck which flows to the south. Villages are small and located on high ground. Farms are large but limited in number. A railway line travels through the character area linking Driffield with Bridlington. The area is traversed by minor roads and lanes. Ditches and drains provide field boundaries and create rectilinear fields.
- 6.6 The current landscape at and in the vicinity of the site contains discordant features including the current Gransmoor Quarry and man-made water bodies. These features are integrated into the local landscape without significant adverse impact to landscape receptors as the loss of defining elements and the disturbance are small in scale and area. The condition and sensitivity of the landscape at and in the vicinity of the site has been assessed and it is concluded in the report presented at Appendix C that the Kelk Beck landscape area has a low sensitivity to change and generally is of good to high condition.
- **6.7** The current situation and current impact of the extension has been assessed with regard to current iand use, pattern and scale of the landscape, visual closure and openness of views, the scope for mitigation and the value placed on the landscape.
- 6.8 The current land use in the extension comprises quarry facilities including an access road, a reception area and disturbed ground used for recycling together with land used for agriculture. It is concluded in the report presented at Appendix C that there is a slight adverse impact on the surrounding area as a result of the current land use at the extension.

- 6.9 The Kelk Beck Farmland local landscape character area comprises two contrasting scales and patterns of landscape. The dominant scale is a large open and expansive landscape with wide views of sky and land. The landscape is influenced by horizontal, linear features such as hedges, ditches and flat landscape. A secondary smaller scale landscape is influenced by screening features such as woodland, small hillocks and well maintained hedges. Views are restricted at this scale. The scale and pattern of the extension in the north is in keeping with the key characteristics of the Kelk Beck Farmland. In the south of the extension the land has lost its structure, scale and pattern due to quarrying activities. Disturbed ground may have interrupted former hedgerow structure. Soil stocking associated with recycling activities does not reflect the horizontal characteristics of the landscape. The current scale and pattern of the extension is assessed in the report presented at Appendix C as having an overall slight adverse impact significance.
 - **6.10** Two types of visual enclosure and openness contribute to the Kelk Beck Farmland local landscape character. At a large scale visual enclosure appears expansive with some long distance views towards the Yorkshire Wolds. On a smaller scale shorter distances can be significantly screened by intervening vegetation due to gentle undulations in the surrounding topography. The extension currently includes agricultural fields enclosed by hedges to the north and to the south and disturbed land associated with the current Gransmoor Quarry recycling area and current Gransmoor Quarry access. As the extension is contained there are a small number of potential receptors in the zone of visual influence. The significance level of impact currently resulting from the extension as a consequence of visual enclosure and openness is assessed as being of slight adverse impact significance.
 - 6.11 As a consequence of the two scales of landscape associated with Kelk Beck Farmland the area has the capacity to accommodate mitigation measures to reduce impacts caused by the proposed development on the surrounding area. Currently there are no formal mitigation measures in place to reduce landscape impacts caused by the current Gransmoor Quarry including the recycling area. The significance level of impact resulting from the absence of mitigation of Gransmoor Quarry including the recycling area is of slight adverse impact significance.

Pl9165final

6.12 The value or importance to society of the local landscape is judged by identifying people who use it together with the level of administrative designations and policies that apply to the site. In the report presented at Appendix C it is stated that the landscape in the extension is not a nationally designated landscape. The site is in a major prehistoric landscape as described in Section 8 of the Environmental Statement. The extension is privately owned and not used by the public currently. No public rights of way cross the site. Potential receptors are limited. The significance level of impact from the current situation is reported to be of slight adverse impact significance.

Visual Amenity

- **6.13** The views of the land in the extension from visual receptors which include properties, public rights of way and transport links have been assessed. A table summarising the potential receptors of the site from local villages and settlements, individual dwellings, transport links and public rights of way is presented at Appendix C.
 - 6.14 In the extension topographical levels are below 20mAOD and the level of the edge of the proposed extraction generally is at 7mAOD. The site is not a skyline feature and is indistinguishable from the surrounding landscape elements due to the generally flat landscape. The northern part of the extension rises towards the hillock feature of Turtle Hill Wood. The small rise creates an uncharacteristic and in the extension area a prominent topographical feature. There are no receptor locations that overlook the application area. To the west of the extension a small rise in local topographic level screens views of the application area from Little Kelk. The number of visual receptor locations is limited by established and well maintained hedges between the extension area and the local villages.
 - 6.15 The features that may result in visual impact in the extension and surrounding the extension are mobile plant, vehicle movements, disturbed ground and localised bunds and stocks from the current recycling area and the current Gransmoor Quarry. The rural character of the site combined with intervening vegetation, the flat nature of the landform and the low density population reduce the potential for

visual impact from the current Gransmoor Quarry. The baseline visual sensitivity of the local level study area is assessed as medium sensitivity to change.

6.16 The Zone of Visual Influence (ZVI) is the area in which the extension may influence or affect the visual amenity of receptors. The detail of the ZVI for the application area is presented at Appendix C. In the ZVI there are two small villages, eight isolated dwellings, three sections of highway and five sections of Public Right of Way. No receptors have been identified as receiving a significant adverse visual impact as a result of the current conditions. Gransmoor Low House and Bridleway 3 have been identified as receiving a moderate adverse visual impact as a result of the disturbed ground and recycling area in the extension. Ten receptors have been identified as receiving a slight adverse visual impact, two receptors have been identified as receiving a very slight adverse visual impact and one receptor has been identified as receiving no visual impact.

7. Ecology

- 7.1 A Phase 1 Habitat Survey including protected species was undertaken in June 2006 to evaluate the wildlife interest in the proposed quarry extension and to characterise the ecological setting of the extension. Based on the results of the survey the main ecological features of the extension are identified. A detailed description of the ecology of the survey area and species lists are presented in the ecological report at Appendix D. Detailed surveys for great crested newts were carried out during spring 2007. The findings of the surveys were considered in preparing the design of the extension and during the assessment of impacts associated with the development. In this section of the Environmental Statement the principal habitats in the extension and the surrounding area are described and notable species are identified. The conservation value of the habitats and species in the extension are discussed.
- 7.2 The principal habitats in the proposed extension comprise one arable field, one complete field and one section of a field of improved grassland and a field of semiimproved grassland. The current recycling area and the current access are surfaced with concrete and compacted hardcore. There are small areas of species rich acidic grassland vegetation present on the south facing slopes and small areas of calcareous grassland vegetation on the top of a mound area in the semi-improved grassland field in the north of the extension.
- **7.3** External boundaries of the extension comprise a combination of hawthorn hedge and post and wire fence. Gransmoor Drain lies to the west at a minimum distance of approximately 15m from the extension and a further drain lies approximately 20m east of the extension. Internally the field boundaries comprise hawthorn hedges and post and wire fences.
- 7.4 To the north of the extension there is an area of mixed woodland, a conifer plantation and grazed semi-improved grassland. To the east the land is improved pasture and arable. An arable field, an area of rough grassland and the current Gransmoor Quarry are present to the south. The current Gransmoor Quarry to the south of the extension includes a large water body with dense aquatic and patchy

marginal vegetation together with wasteland vegetation and rough grassland. To the west beyond Gransmoor Drain lies an arable field.

- 7.5 There are low sandy cliffs in the northern field associated with a track passing through a mound area that may support invertebrate populations including species of bee and wasp. Areas of cliff around the lagoon in the current Gransmoor Quarry have evidence of use by bees and wasps. Gransmoor Drain and the drain to the east of the extension are considered unsuitable for white-clawed crayfish.
- 7.6 There was no evidence of great crested newts and no eggs were found during the survey visits. Two smooth newts were found and large numbers of tadpoles were present in the lagoon in the current Gransmoor Quarry. Large numbers of carp are present in the lagoon. Although it is considered that there is habitat suitable for reptiles on the banks of Gransmoor Drain, the drain to the east of the extension and the lagoon in the current Gransmoor Quarry no evidence of reptiles or amphibians was found during the surveys. The habitat in the extension is unsuitable for reptiles.
- 7.7 No evidence was observed of habitat suitable for bats in the extension. Although bats were observed feeding over the lagoon in the current Gransmoor Quarry the extension is open and unlikely to attract bats. A water vole was observed in the eastern drain and evidence of water voles was found in Gransmoor Drain and around the lagoon in the current quarry. No evidence of otter or badger activity was found in the survey area. Brown hares were seen in the east of the extension.
- **7.8** In total 17 species of bird were recorded using the extension. The cattle grazed grassland over much of the extension is too short to provide cover for ground nesting birds. Grey partridge and skylark which are listed in the Biodiversity Action Plan (BAP) for the East Riding of Yorkshire⁷ may nest in the arable crop and the hedges may provide suitable nest sites for linnet and yellowhammer which are BAP/Red list species.
- 7.9 There are no Local Nature Reserves or National Nature Reserves in the extension or within 2km of the extension. There are no Ramsar Sites, Special Protection

PI9165final

⁷ 'UK Biodiversity Action Plan http://www.ukbap.org.uk/lbap.aspx?id=502#6 Accessed 14 June 2007'.

- Areas (SPA) or Special Areas of Conservation (SAC) in the extension or within 5km of the extension. There are no SSSI in or close to the extension. The SSSI closest to the site is the River Hull Headwaters which is the most northerly chalk stream in Britain supporting a diverse range of aquatic and marginal plants and several locally uncommon invertebrates.
- 7.10 There are no Sites of Importance for Nature Conservation (SINC) in the extension. Six SINC are present within 2km of the extension including a site listed as Thronham Hill Gravel Pit which is in the boundary of the current Gransmoor Quarry.

8. Archaeology

- 8.1 An archaeological desk study, site inspection and walk over survey were carried out in 2006. The study area for database searches included the extension and the surrounds within a 3km radius. Because of the potential for the presence of archaeological remains in the extension an archaeological investigation by trial trenching was carried out in March 2007. The results of the investigation included in the cultural heritage assessment are presented at Appendix E.
- 8.2 No designated features of cultural heritage importance lie within the boundary of the extension. There are no World Heritage Sites, Heritage Coasts, Historic Parks and Gardens or Registered Battlefields within the 3km study area and there are no listed buildings or conservation areas within 1km of the extension. Five Scheduled Ancient Monuments lie within 3km of the extension and other sites and monuments within 1.5km of the extension are listed in the report presented at Appendix E.
- 8.3 The extension lies in a landscape of important prehistoric archaeology with documented evidence from the current Gransmoor Quarry of upper Palaeolithic and Iron Age activity. There is a nationally important Iron Age centre for bronze casting at Whitehall Farm, Kelk approximately 60m to the north west of the proposed development area. Lake dwellings of prehistoric or Roman age have been recognised in the vicinity. In the extension there are areas of higher ground that could have formed suitable islands for settlement in the general landscape of marsh or lake that would have existed in prehistoric times.
- 8.4 From the investigation of the site by trial trenching it is concluded that the extension area has little archaeological interest compared with other sites in the vicinity.

PI9165final

9. Soil resources and agricultural land quality

- 9.1 The report in which the soils and Agricultural Land Classification at the extension are described is presented at Appendix F. Soil in the extension is variable. Two main groups are recognised. Well drained sandy soils referred to as Soil Type A are present on the sandy and gravelly ridge in the north and centre of the extension. The sandy soils are limited to Agricultural Land Classification (ALC) Subgrade 3b because of a droughtiness limitation and the gradient of the ridge. A very gravelly area in the south and areas disturbed by former sand and gravel extraction in the north are graded ALC Grade 4.
- 9.2 On the lower land there is a heterogeneous collection of soils grouped collectively as Soil Type B. The textures range from sandy to clayey often in the same profile. Some of the profiles examined during the site surveys contain peat, stones and calcareous material in varying proportions. The main limitation of these areas is the soil pattern and subjectively they have been graded at ALC Subgrade 3a.

Pl9165final

10. Geology

- 10.1 The geology of the extension is taken from the British Geological Survey (BGS) 1:50,000 scale provisional series Sheet 64 Great Driffield Solid and Drift Edition and the BGS 1:100,000 Hydrogeological Map of East Yorkshire together with the logs of four groundwater monitoring boreholes drilled at the extension in September 2006 and seventeen mineral proving boreholes drilled at the extension during September 2003. The locations of the boreholes drilled at the extension is presented as Figure 6. The logs of the boreholes drilled at the extension are provided at Appendix G. As discussed in Section 3 the ground level at the edge of the proposed extraction is approximately 7mAOD. There is a low sinuous ridge up to approximately 12.95mAOD in the extraction. The ridge trends north to south in the east of the extension and west to east in the north of the extension.
- **10.2** The geology at the extension comprises Quaternary glacial deposits and alluvium overlying the Cretaceous Chalk. The chalk comprises a marly fine grained limestone. Based on the geological map the chalk is approximately 450m thick in the vicinity of the site.
- 10.3 From the geological map the Quaternary glacial deposits in the vicinity of the extension comprise till and Glaciofluvial Ice-Contact Deposits. The groundwater monitoring boreholes were terminated in the chalk at a depth between 16.7m and 18m below ground level which is equivalent to approximately 9.7mBOD (below Ordnance Datum) and 9.25mBOD. The mineral proving boreholes which were installed in the area of the ridge were terminated at a depth between 7m and 10m below ground level which is equivalent to approximately 6mAOD and 3mAOD. The base of the drift deposits at the extension is between approximately 8.25mBOD and 9.6mBOD. The low sinuous ridge at the extension comprises Glaciofluvial Ice-Contact Deposits. The Ice-Contact Deposit is shown on the geological map surrounded by alluvium. The alluvium is underlain by till. The extension will be excavated into quaternary glacial deposits and alluvium. The glacial deposits comprise generally a sequence of gravely or sandy gravely clay, silt or gravely silt

11. Hydrology

- 11.1 The extension lies in the catchment of the Barmston Main Drain which flows generally from west to east approximately 3.7km to the east south east of the extension to outfall to the North Sea approximately 6km east south east of the extension. Approximately 1.8km to the west of the extension the Kelk Beck flows from north to south forming part of the headwaters of the River Hull which have national importance as the most northern chalk stream system in England. The Kelk Beck approximately 1.8km west of the extension is a SSSI. The western edge of the extension is located in an area with a risk of flooding from the Gransmoor Drain of less than 1 in 75 but greater than 1 in 200 (Figures 7a and 7b).
- 11.2 The Gransmoor Drain flows generally from north to south close to the western boundary of the extension turning east approximately 1.4km south south east of the extension towards a confluence with Burton Drain approximately 3km east south east of the extension. Burton Drain flows in a south easterly direction to the Barmston Main Drain (Figure 8). A drain runs near to the eastern boundary of the extension. It is likely that the drain discharges to the Gransmoor Drain to the south of the extension. The Gransmoor Drain and the Barmston Main Drain are managed by the Beverley and North Holderness Internal Drainage Board. The ground level between the extension and the Gransmoor Drain is approximately 7mAOD and the invert level of the Gransmoor Drain is approximately 2m below ground level which is equivalent to approximately 5mAOD.
 - 11.3 The surface water feature closest to the proposed limit of extraction is a lagoon in the base of the current Gransmoor Quarry approximately 150m south south west of the proposed limit of extraction. There is a large pond known as Kelk Lake approximately 400m west north west of the north west corner of the proposed limit of extraction.
 - 11.4 The quality of the water in the Barmston Main Drain is monitored by the Environment Agency approximately 6.3km east south east of the extension at NGR TA 172 587. The monitoring location is downstream of the extension. Since 1991 the chemical quality of the river has been classified as fairly good or fair. In July 2006 samples of water were taken from the lagoon in the current Gransmoor

- Quarry and from the Gransmoor Drain in the area of the current Gransmoor Quarry. The samples were analysed for pH and electrical conductivity, together with the concentrations of chloride, potassium, ammoniacal nitrogen and biochemical oxygen demand (BOD). The results of the analyses show that the concentrations recorded were below the environmental quality standards (EQS) and the UK drinking water standards for the determinands tested.
 - **11.5** There is one licensed and one unlicensed surface water abstraction within 2km of the boundary of the extension. The licensed and unlicensed surface water abstractions are from the Gransmoor Drain and are for agricultural use. The surface water abstraction point closest to the extension is approximately 1.2km north north west upstream of the extension. The licensed abstract point is approximately 1.6km south east and downstream of the extension. Details of the surface water abstractions in the vicinity of the extension are presented in Table 2. The locations of the surface water abstractions are shown on Figure 8. It is considered that the extension is in a sensitive location in respect of surface water abstractions.

PI9165final

Hydrogeology

- 12.1 The superficial deposits and the chalk in the vicinity of the extension are water bearing. It is likely that the sand and gravel deposits have a moderate to high permeability. It is likely that the till and alluvium have a low to moderate permeability. It is likely that the chalk has a low primary permeability with a high secondary permeability imparted by fissures and fractures.
- 12.2 Groundwater was struck in the superficial deposits in four groundwater monitoring boreholes drilled at the extension in September 2006. Groundwater levels approximately 1.54mBOD to 3.75mAOD were recorded in September 2006 following the installation of groundwater monitoring facilities in the superficial deposits. Groundwater was struck in 9 of the 17 mineral proving boreholes drilled in September 2003 between approximately 3.4mBOD and 7.1mAOD. Based on the recorded groundwater strikes in the mineral proving boreholes groundwater levels in the superficial deposits generally are lower in the south and south east of the extension. There is evidence from the monitoring data recorded since September 2006 that locally the groundwater flow direction may be to the south and south east. It is likely that the groundwater flow direction locally is influenced by the dewatering of the current Gransmoor Quarry located to the south of the extension where the water levels are maintained at approximately 5mBOD. In the absence of pumping at the current Gransmoor Quarry it is considered that groundwater levels at the extension would be at a level between 3mAOD and 7mAOD. It is likely that at times when the groundwater in the extension is above the water level of the Gransmoor Drain groundwater will drain through the superficial deposits to the drain.
- 12.3 Based on the BGS Hydrogeological Map of East Yorkshire the regional direction of groundwater flow in the chalk is to the south east. The water level in the chalk in the vicinity of the extension is shown on the Hydrogeological Map of East Yorkshire at 10mAOD. Based on water levels on the Hydrogeological Map of East Yorkshire and the recorded elevation of the top of the chalk it is likely that the groundwater in the chalk in the area of the extension is in continuity with the overlying superficial deposits. The Hydrogeological Map of East Yorkshire dated March 1970 shows the extension located in an area of artesian outflow.
12.4 The sand and gravel deposits and alluvium are designated minor aquifers by the Environment Agency and the Cretaceous Chalk is designated a major aquifer by the Environment Agency. There is one licensed groundwater abstraction and two deregulated groundwater abstractions within 2km of the extension. The licensed abstraction located approximately 120m south west of the proposed limit of extraction is for abstraction of groundwater from the superficial deposits for the purpose of mineral washing at the current Gransmoor Quarry. The two deregulated groundwater abstractions were licensed formerly for the abstraction of groundwater from the chalk. One abstraction is for domestic and agricultural use and the purpose of the other abstraction is unknown. Details of the groundwater abstractions in the vicinity of the extension are presented in Table 2. The locations of the groundwater abstractions are shown on Figure 8. The extension is not located in the Source Protection Zone for any public water supply abstraction. It is considered that the extension is in a sensitive location in respect to groundwater level and the licensed groundwater abstractions.

Pl9165final

13. Noise

- 13.1 To establish background noise levels in the vicinity of the extension the site was visited on 12 October 2006 and receptors potentially sensitive to noise were identified. Noise levels were measured at three residential properties close to the extension. The noise assessment is presented at Appendix H.
- 13.2 The potentially noise sensitive locations are Gransmoor Low House, Turtle Hill Farm and North End Farm. In accordance with BS 7445: 1991 noise levels were measured every 15 minutes over a period of 2 hours. The background noise levels ranged between 35dBL_{A90} and 41dB L_{A90} at Gransmoor Low House, between 32dB L_{A90} and 46dB L_{A90} at Turtle Hill Farm and between 40dB L_{A90} and 42dB L_{A90} at North End Farm. A summary of the noise levels for each of the monitoring locations is presented in Table 3.
- **13.3** The general noise climate at all the monitored locations was influenced by noise from local road traffic and farm activities. The current Gransmoor Quarry and recycling operations at Gransmoor Quarry are considered inaudible at the three noise sensitive properties.
- 13.4 It is considered that the noise levels measured during the investigation are representative of the noise climate for the area round the extension. Based on the nature of the predominant noise sources affecting the survey locations it is considered that the parameters measured provide a reliable record of the background daytime noise levels round the extension.

14. Meteorology

- 14.1 A wind rose for the coastal town of Bridlington which is north east of the extension for the period 2001 to 2005 is presented at Appendix I. The wind rose was provided by ADM Limited who are an approved supplier of meteorological data. The prevailing wind is from the west. It is considered that the Bridlington wind rose is the most representative for the extension.
- 14.2 Wind speeds for 48% of the year are between 1.54m/s and 5.14m/s varying from light air through light breeze and gentle breeze on the Beaufort Scale (Appendix I). Wind speeds between 5.14m/s and 8.23m/s classed as moderate breeze on the Beaufort Scale are recorded for 29% of the year. Wind speeds greater than 8.23m/s are rare occurring for approximately 15% of the year (Table 4).
- **14.3** As stated in the DoE guidance⁴ it is generally accepted that windblow of dust does not occur on days when rainfall is in excess of 0.2mm. The Environment Agency provided rainfall data for the period January 2000 to October 2006 for a rain gauge located at Driffield which is approximately 8.5km west south west of the extension and is the rain gauge closest to the extension. The average number of days per month with a rainfall greater than 0.2mm ranges from 9 to 17 days (Table 5).
- 14.4 It is understood from consultations with the East Riding of Yorkshire Council Public Protection Department that there are no air quality monitoring data for the extension or the locality. The nearest air pollution monitoring site is located at Bridlington.
- 14.5 The East Riding of Yorkshire Council Public Protection Department has stated that there are no processes authorised under the Environmental Protection Act 1990 located at the extension. A Part B authorisation for mobile crushing plant is held by W. Clifford Watts Limited for a crusher that is operated occasionally as part of the recycling operation at the current Gransmoor Quarry adjacent to and south of the extension. The East Riding of Yorkshire Council Public Protection Department advise that there are no other processes authorised under the Environmental Protection Act 1990 located in the vicinity.

14.6 The only significant sources of atmospheric pollutants in the immediate vicinity of the extension are local roads and agricultural sprays. Windblown dust from exposed agricultural soils in the vicinity of the extension is likely periodically. It is considered likely that the air quality in the vicinity of the extension is good.



APPENDIX B – MJCA Carters Borehole Logs and Location Plan



Key / Notes		Site GRANSMOOR QUARRY EXTENSION
		Client W. Clifford Watts Limited
The application boundary		Title Plan showing approximate locations of groundwater monitoring horsholes drilled in
Approximate area of the		September 2006 and mineral proving borehole drilled in September 2003
BH1 Approximate location of a		Figure 6 Scale 1:2500
groundwater monitoring borehole		Drawing Ref WCW/YO/06-07/13598
1/03/07 Approximate location of a mineral		Drawn by Approved by Checked by KR CN
proving borehole		Revisions
	•	
Baddesley Colliery Offices, Main Road, Baxteriey, Atherstone, Warwickshire, CV9 2LE. Telephone : 01827 717891		Reproduced from Land-Plan® 1:2,500 scale mapping by permission of Ordnance Survey® on behalf of The Contro of Her Majesty's Stationery Office. © Crown copyright 200

APPENDIX G

LOGS OF THE GROUNDWATER MONITORING BOREHOLES DRILLED IN THE EXTENSION IN SEPTEMBER 2006 AND LOGS OF THE MINERAL PROVING BOREHOLES DRILLED AT THE EXTENSION IN SEPTEMBER 2003

WCW/YO/CEW/2607/01 June 2007 MJEA

Pl9165final

Technic	1 al advisert	s on envir		Ba M Ba Sues Te Fa	addesley C ain Road, axterley, A arwickshir lephone: (lcsimile: 0	colliery O therstone e. CV9 2 01827 71	ffices, LE 7891 8507					во	RE	EHO	LE	LOC	3				
Proje	ict							C	lient					1				[Date C	Comp	letec
	Gr	ansm	oor ext	tensio	<u>п</u>		0		(4 0	W. C		ord W	/atts		ed				21/0	9/20	206
Proje		~1.6.1.0./	о лт и	14031	14		Ground	Levei	(mau	0)		o-orain	ates (0					orena	DIE N DIL 1	0.
Con			0/11/1		/ I				ocatio										Sheet		
COM	Sit	e inve	estinati	on Se	nvices				ocatio	Fast	Rid	dina c	f Yo	rkshin	2				1	of	3
											1 44	STRA								<u> </u>	Ţ ₽
Scale	Redu Let	uced vel	Dej (Thi	pth ck-								DE	SCRI	PTION					egend	Water	ustrume
			(0.	70)	Loose	dark b	prown cla	ayey T	OPSC)IL								<u>1911</u>	<u>1. 57</u> <u>347</u> <u>3</u> <u>5</u> 36 <u>5</u> 12		
1			[<u>0.70</u> 90)	Sandy round	v slightl ed.	y gravel	IY SILT	r with	some o	rgai	nic ma	tter. (Gravel i	s subro	unded t	o well				
2				2.60	Grey s	lightly	sandy s	lightly	gravel	TY SILT	. Sa	ind is n	nediu	m to co	arse. G	iravel is	- -	× × × ×			
3			- - - - -	20)	500101	110601	o round				urn.							AN A OK SKO YON			
4			- - - - - - - - - - - - - - - - - - -	50)	Stiff to rounde	firm re ed and	ddy bro fine.	wn slig	ghtly s	andy sli	ightl	ly grav	elly C	LAY. G	ravel is	subrou	nded to				
5				5.30	Yellow	mediu	m to coa	arse S	AND a	Ind sub	rou	nded to		nded fir	e to ma	edium G					
			(0.1	50) <u>5.80</u>								.						0000			
GRO		WAT	ER						RF		KS	5 / INS	STAI	LLATI	ONS		DRI	مّا NILL	<u>ت جڑا</u> G		<u>0</u>
Date	AM PM	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed										Plant: Crew: Type a	Dando 1 percussi E. Corin E. Corin	ion drillin ig. J. Ch amete	e ng rig ristie r De	epth
									GGE	ED BY				P. Maso	on		-				

Technica				Ma Ba Wa sues Tel Fa	in Road, xterley, At arwickshin lephone: 0 csimile: 0	herstone e, CV9 21 1827 71 1827 718	E 7891			BO	REHO		G			
Proje	ct							Client						Date C	omple	ete
_	Gr	ansm	oor ext	ensio	n			<u>W.</u>	Cliff	ord Wa	atts Limit	ted		21/0	9/200	06
Proje	ct No.	~\	~~~··	1000	4		Ground	Level (mAOD)		o-ordina	ies ()					•
Cont		JVV/Y	0/11/1	403/0	1			Location				····		Sheet		
Cont	Sit.	e Inve	estinati	on Se	rvices			Eas	t Ri	dina of	Yorkshi	re		2	of 3	į
										STRA	TA			· · · · ·	1	Λu
Scale	Redi Lev	uced vel	Der (Thi	oth ck- is)		· · · ·				DES	CRIPTIO	N		Legend	Water	Instrume
7			- - - - -	70)	Firm ro	eddy bi Inded 1	rown slig to round	htly sand slightly ed and fine. <i>(cont</i> i	grave nued	elly CLA	Y. Sand is	s medium. Gra	avel is		ن ور مان	
			F	7.50	Soft to mediu	firm re m.	eddy bro	wn slightly gravell	y CL	AY. Gra	vel is subr	ounded to rou	unded and			
			- (U. -	50) e on												6 6 E
-9			(2.	70)	mediu											
11			- (0.1	10.70 80) 11.50	Firm re chalk.	ddy br	own ver	y gravelly CLAY. (Grave	el is sub	rounded to	o rounded fine	e to medium			
					Subrou	inded f	o round	ed fine chalk GRA	VEL	•				0000 000 000 000		White
GRC	DUND	WAT	ER					REMA	RKS	S / INS	TALLAT	IONS	DRILL	ING		
Date	AM PM	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed						Plant: Dan Crew: perc E. G Type and	do 150 cable ussion drillin oring, J. Chr jyDiameter	ig rig istie, A	oth
								LOGGED B	Y		P. Ma	son				

		environ		Ba Ma Ba Wa ues Te Fa	ddesley C ain Road, xterley, At arwickshire lephone: 0 csimile: 0	olliery O herston e, CV9 2 1827 71 1827 71	ffices, e, tLE 17891 8507			BOREHOLE LO	G			
Proje	ct				000000			Client	_			Date C	Comple	ete
	Gran	smo	or exte	ensio	n		<u></u>	W.	Cliff	ford Watts Limited		21/0)9/20	
Proje	Ct NO.	winic	VTT/1.	งกระก	1		Ground L			o-oromates ()		Boien	3H1	•
Cont	ractor			+00/0				Location				Sheet		
	Site I	nves	stigatio	on Se	rvices			Eas	st Ri	iding of Yorkshire		3	of 3	
e										STRATA		,	er	'lent/'
Scal	Reduce Level	d	Dep (Thic ness	th ≭- s)								Legend	Wat	flnstrun
13			(2.5	50)	Subro	unded	to rounde	ed fine chaik GRA		L. (continued)				<u>, 00, 00, 00, 00, 00, 00, 00, 00, 00</u>
14			(0.8	<u>14.00</u> 30)	Subro	unded	to rounde	ed fine to medium	n ch	alk and flint GRAVEL.			٩٠٠ و٩٩٠ و٩٩٠ و٩٩٠ و٩٩٠ و٩٩٠ و	200 00 00 00 00 00 00 00
15			1	4.80	Grey v	rery gr	avelly SIL	T. Gravel is subr	ound	led to rounded fine to medium ch	nalk.	× ×		22.02
		ł	(0.7	70)								× × ×		2
		F	1	15.50								Ŷ×Ŷ		2
		-	() F	50)	Grey v	ery gr	avelly SIL	T. Gravel is subr	ound	ded to rounded fine chalk.		×o ×		20
4.5		F	(0.0	16.0D								×°× v		2
0			(0.7	'0) 16 70	White	Chalk							2 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22222222222
17			-		END C	OF BO	REHOLE							<u> </u>
GRO	DUNDW	ATE	R				T	REMA	RK	S / INSTALLATIONS	DRILL	ING		
Date	AM D	epth of	Depth of	Depth to	Depth struck	Deptr after	Depth sealed				Plant: Dar	nde 150 cab	le inc =c	
	PM I	note	casing	water		mins					Crew: per	cussion drilli Soring, J. Ct	ing ng h ristie, A	
	ł										Type agg	Juamete	er Der)t
	1						1 -		$\overline{\mathbf{v}}$	P Mapon				

Technica			Bad Main Bax War Ues Tele	Idesley Col n Road, terley, Athe rwickshire, ephone: D1	liery Officerstone, CV9 2LE 827 7178	ces, 391			BOREHOLE I	_0G			
Proje	ct	<u></u> ,	1 20	anne, or	21 1100		Client				Date Co	omplete	d
	Gransr	noor exte	ension	۱			W.	Cliffo	ord Watts Limited		20/0	9/2006	<u>}</u>
Proje	ct No.				G	Ground I	Level (mAOD)	Co	-ordinates ()		Boreho	le No.	
	wcw/	YO/TT/14	403/0	1					<u> </u>	<u>.</u>	B	HZ	
Cont	ractor		_	_							Sheet	of 2	
	Site Inv	estigatio	on Ser	vices			Eas				' '		_
<u>e</u>			. 1									ater	
Sce	Reduced Level	(Thic ness	tn :k- s)		_,				DESCRIPTION		Legend	SInstru	-
		Ł	1	Loose t	orown :	sandy to	opsoil				1/ 1/ 1		
		(0.6	50)								<u>16</u> 16		
	<u>_</u>	<u>}</u>	0.60								16 S. 11. N		
		Ļ		Yeilow/	brown	fine to r	medium SAND						
-		Ĺ											
1		F	1										
		F											
		F											
		È.											
		Ľ										0.0	_
2		F										0.0	Ξ
		F									· · · · ·	0.0	Ē
		- (3.6	50)	2.30 Sc	ome su	ibround	ed fine chalk grav	vel			· · · · ·	0	Ē
		Ļ									· · · ·		
i	ł	È.											
2		Ł										Ď	Ē
5		ł										5	Ē
		-										Č.	Ē
		F										5	_
		È.										5	Ē
	1	ł										0. - Ci	Ē
-4	ł											00	Ē
			4.20	Brown	SILT					<u></u>	× ×	0	Ē
		- (D.:	30) 4.50									0	Ē
		ł		Yeilow/	brown	mediun	n to coarse SANI) and	medium subrounded to rou	Inded GRAVEL	000	0	Ē
		F									0000	0 0	Ē
-5		Ļ.									0000		E
-	ſ	Ę									0000	00	Ē
		F	1								000	0	Ē
		ŀ	ļ				•				0000	-0 -	Ē
	ļ	F									0000	0	Ē
	1	F									000		E
GR		TER					REM		S / INSTALLATIONS	DRIL	LING		
Date	AM De DM bo	oth Depth f of	Depth to	Depth struck	Depth after 20	Depth sealed				Plant: D Crew: p	ando 150 cab ercussion drill	le ing rig	_
		.e ocomy		+	ារពិនិ	+	1			Type ag	. Coring, J. M RdsDiaMate	alan, J. Bre Dep	th
							LOGGED	BY	P. Mason			ł	
		1	1	1	1	1	1 200000	- •				1	

Technica	al advisers o	n environ		Baxt Wan es Tele Facs	erley, Atha wickshire, phone: 01 simile: 016	erstone, CV9 2LE 827 7178 827 7185	E 391 507			BOREHOL	E LOG			
Projec	ct			/ -				Client					Date Co	mplete
	Gra	nsmo	or exte	nsion	. <u></u>			W. 1		rd Watts Limited		_	20/09	/2000
Projec	ct No.						Sround L	evel (maod)	0.	ordinates ()			BI	42
0	WC	W/YC		103/01	 	l		Location					Sheet	
Contr	racior Site	inves	tinatio	n Ser	vices			Eas	t Rid	ing of Yorkshire			2 0	of 3
						<u> </u>			5	TRATA				ent/
Scale	Reduc Leve	ced el	Depi (Thic	th k-						DESCRIPTION			Legend	Wate
·7 ·8			- (6.8 -	30)	(continu	prown <i>ied</i>)	meaium							
- 10		- - - - - - - - - - - - - - - - - - -	-											
-11			-	11.30									0000	00,00
		-		11.50	Soft ve	ry san								000
			(0.:	30)	Soft to	firm da	ark brow	n/ grey CLAY						0
				11.80	Brown	mediu	m SAND	with fine to med	ium s	ubrounded to well ro	unded GRAV	EL	°0 - °0	0
GRO		WATI	ER	ļ				REM/	RK	/ INSTALLATI	ONS	DR	ILLING	<u>مين</u>
	AM	Depth	Depth	Depth	Depth	Depth	Depth				· · · ·	Plant:	Dando 150 cable	
Date	PM	of hole	of casing	to water	struck	20 mins	sealed				·	Crew:	percussion drillin	ig rig Ian I
			<u>† </u>		-		1					Туре	andsDiamate	e Dep
			ł											
					1									
		l I										1		

	al advisers o	n environ		Bad Mai Bax Wa Wa Va Fac	idesley Co n Road, terley, Ath wickshire, sphone: D1 simile: 01	lliery Offi erstone, CV9 2Li 827 717i 827 718i	ces, E 891 507	Client	B	OREH		OG	Date Co	mple	ete
0,00	 Gra	nsmo	or exte	ensior	n			W. (Clifford	Watts Lir	nited		20/09	9/200) (
Projec	ct No.					0	Ground L	evel (mAOD)	Co-ord	dinates ()			Borehol	e No	-
	wc	W/YC	D/TT/1-	403/0	1								В	H2	
Contr	actor					. 1		Location	1	<u> </u>			Sheet		-
	Site	Inves	stigatio	on Ser	vices			Eas	t Riding	g of Yorks	hire		3 (of 3	-
									STI	RATA				-	2400
Scale	Reduc Leve	xed el	Dep (Thic ness	th k- s)					[DESCRIPTI	ON		Legend	Wate	Inefrim
			(1.2	20)	Brown (contin	mediur ued)	m SAND	with fine to medi	um subro	ounded to v	vell rounded (SRAVEL			00, 00, 00, 00, 00
13 -		 		13.00	Brown 13.10 S	mediur Subrou	n SAND nded cob	with fine to medi ble 15cm x 8cm	um subr x 7cm	ounded to r	ounded GRA	7el	0 - 0 0 - 0 0 - 0 0 - 0 0 - 0 0 - 0		
			(1.0	00)									0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	يون و <u>ور</u> و ورون و	
14				14.00	Firm da	ark bro	wn/arev s	lightly gravelly C	LAY. Gr	avel is subr	ounded to rou	Inded and fine	<u>a a a</u>		l
15			(1.5	50)										و و لام و مرام و مام و مام و مام و ماد	
		 		15.50	Fine st	ibround	ded to ro	unded GRAVEL	with som	e fine brow	n SAND		0000	-9	
16		- - - - - - - - - - - - - - - - - - -	- (1.5	50)										• <u>~</u> 9	
17		۲ با ا		17.00	14/								0.00		
			(1.0	00)	vvnite (JHALK									
			-R	18.00	END O	F BOR	EHOLE		RKS /		ATIONS	DRILL	Ing NG		-
Date		Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed					Plant: Dan Crew: perc	do 150 cable ussion drillin	e Ig rig	-
												Type and	onng. J. Ma sipijamatai	re De	p
															-
								LOGGED E	IY	Ρ.	Mason				

Projec	il advisers on	environ	mental issu	es Tele Face	phone: 011 simile: 015	827 7178 327 7185	191 07	Client				<u>.</u>		Date Co	mple	te
	Gran	ismo	or exte	nsion				W. (Cliffo	d Watts	Limited			25/09	9/200)6
Projec	t No.				<u>-</u>	G	Found L	evel (mAOD)	Co-r	ordinates	0			Boreho	e No.	
	WCV	N/YC	D/TT/14	403/01										B	H3	
Contr	actor			_				Location			tehine			Sheet	-f 2	
	Site	inves	stigatio	n Ser	vices			Eas			orksnire	•				Į
e										IKAIA					ater	I T D
Sca	Reduce Level	ed I	(Thic ness	(n k- 5)		<u>.</u>			<u></u>	DESCR		ounded and		Legend	Š.	Alnetri
		ŀ			to medi	orown s um.	slightly g	ravelly TOPSOIL	., Grav	el is suba	ngulai to subi	oundeu and		1. <u>1.</u>		1
		ŀ	(0.7	0)										<u>16</u> 16		
		ŀ		0.70										<u>5 24</u> 2		
Ē					Dark br	own sl	ightly sa	ndy slightly grave	lly CL	AY. Sand	is medium to	coarse and g	gravel	0-0		
1		F	-		ia auudi	guiai	10 30010									
		Ē														
ĺ		E	(1.5	50)												
		E												0-0-0-	1	2
		Ę														
2		F	_	2 20											9	ž
ŀ				2.20	Grey co	arse S	AND an	d subrounded to	round	ed fine ch	alk GRAVEL			0-0	90	ī
		þ												00.00		Š
		ŀ												00.00	100	b C
		ļ												000		ĉ
3		ŀ	- (1.6	50)										000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ç
		ŀ												000		с С
		ţ												0000	1	Č
		-		3.80										0000		č
<u> </u>					Dark re	ddy br	own slig	htly gravelly CLA	Y. Gra	vel is sub	rounded to ro	unded fine.				Ć
4		Ē	-													5
		E										·			100	b
		F														ī
		ŀ	(2.0	00)											28 C 14	b
5		ŀ														č
		ŀ													9 a a a	È Į
		ŀ														į į
		F	•													ں م
				5.80	Brown		stiff clint	htiv gravelly CLA	Y. Gra	vel is sub	rounded to rou	unded and fir				Ì
	ערוארי							DENA	RKC			3 [1		<u>1— — </u> ING	<u> </u>	į
GRU		Depth	Depth	Depth	Depth	Depth	Depth			/ 1101/		- [1 P	lant: Dan	do 175 cabi		-
Date	PM	of hole	of casing	to water	struck	after 20 mins	sealed					c	rew: perc	ussion drilli	ng rig	
·			<u> </u>				<u>├</u>					Т	ype and	piamete	rpDe	F
				ł												
								LOGGED F	3Y		P. Mason					

Technik	al advisers	n enviror	mental iss	Bau Wa sues Tel Fac	xteriey, Ath nwickshire lephone: 0 csimile 01	nerstone, CV9 2LI 1827 717	E 891			BOREHOLE LOG	•			
Proje	ect							Client				Date Co	ompi	eted
	Gra	ansmo	or exte	ensior	'n			W. C	Cliffo	ord Watts Limited		25/09	9/20	06
Proje	ect No.					0	Ground	Level (mAOD)	Co	o-ordinates ()		Borehol	le No).
	WC	W/YC	D/TT/1	403/0	1							В	НЗ	
Con	tractor							Location				Sheet		_
	Site	e Inve	stigatio	on Se	rvices	-		East	Ric	ding of Yorkshire		2	of 3	}
6				<u>.</u>						STRATA			ے ا	lent
Scal	Redu Lev	iced rel	Dep (Thic nes	oth ck- s)						DESCRIPTION		Legend	Wat	e Instrun Backfil
- 7 - 8 - 9 - 10			. (5.2	20)	Brown (contin	firm to ued)	stift slig	htiy graveliy CLAY	. Gr	avel is subrounded to rounded and	1 Tine.			
-11				11.00	Soft to mediur	firm br	own ver	y gravelly CLAY. G	Srave	al is subrounded to rounded and fi	ne to			
-			(0.7	70)	medidi		•							
-				11.70	Grey ve	ery grav	velly SIL	T. Gravel is subro	unde	ed to rounded and fine to medium	chalk.	× × ×		
GR			ĒR					RFMAR		S/INSTALLATIONS	DRILL	⊥ <u>×″≯</u> ING	Þ	л <u>н</u> т
Date	AM	Depth of	Depth of	Depth to	Depth struck	Depth after 20	Depth sealed				Plant: Dan Crew: perc	do 175 cable ussion drillin	e Ig ria	
-	PM	noie	casing	water		mins					E.C	oring, J. Chr	istie, .	A
			1								iype agaa	h, ng Mising	p-19	#HØ
			[
			1					LOGGED B	ΥŢ	P. Mason	1			

K Technica		n environ		Bad Maii Bax War res Tele Fac	desley Co n Road, terley, Ath wickshire, ephone: 01 simile: 01	liery Officerstone, CV9 211 827 7178 827 7185	ces, E 391 607			BOREH		G		<u> </u>	
Proje	ct							Client	-1-66		ited		Date Co	mple	etec Ne
	Gra	nsmo	or exte	nsion	۱ 		Second 1			ord vvatts Lim			Borehol		
Proje	ct No.	NIN/-	\/ TT 14-	10.210	4		siouna L			-orumates ()			B	H3	-
Cont		vv/YC	///////	+03/0	1			Location	_				Sheet		
-000	Site	Inves	stigatio	n Ser	vices			Eas	t Ric	ing of Yorksh	ire		3 (of 3	
<u> </u>	0.10							<u> </u>	5	STRATA			<u>'''''</u>	_ [ent/
Scale	Reduc Leve	ed al	Dept (Thic	ih k-						DESCRIPTIC	IN .		Legend	Wate	Instrum
13			- (2.6	50)	Grey vi	ery gra ued)	velly SIL	T. Gravel is subro	ounde	ed to rounded ar	nd fine to mediur	n chalk.	× × × × × × × × × × × × × × × × × × ×		
14			(0.7	1 <u>4.30</u> 70)	Soft gr	ey CLA	Ŷ						× × × × × × × × × × × × × × × × × × ×	1	
15		- - - - - - - - - - - - - - - - - - -		15.00	Grey v	ery gra	velly SIL	T. Gravel is subr	ound	ed to rounded ar	nd fine to mediur	n chalk.	× × × ×	<u>٩٠ و ٩٥ و ٩٥ و ٩٥</u>	2 CO. CO. CO. (
40			(1.0	00) 16.00									x × × × × × × × × × × × × × × × × × × ×		
0			(1.0)0)	White	Chalk			_					1 20 5 5 10 5 10 5 5 00 5 5 00 5 5 00 5 5 00 5 5 00 5 5 00 5 5 00 5 5 00 5 5 00 5 5 00 5 5 00 5 5 00 5 5 00 5 5	0.00.00.00
17		- 		17.00	END O	FBOR	EHOLE								0
0.5							1		סעמ						
GK		Depth	Depth	Depth	Depth	Depth	Depth					Plant: Dan	do 175 cable	;	
Date	DM	of	of	to water	struck	after 20	sealed					Crew: perc	ussion drillir	ıg rig	_
	194 - T				<u> </u>	ារពាទ	+					Type aga	ioring JCh Dia Masta	riptio, /	a. Ati
						- 									
								LOGGED E	3Y	P. N	lason				

Technic	al advisers	pn envira		Ba Ma Ba Wa sues Tel Fa	adesley C in Road, xterley, Atl arwickshire lephone: 0 csimile: 0	olliery Off herstone, a, CV9 21 1827 717 1827 718	nces, .E 7891 . :507			BOR	EHOL	ELOC	<u> </u>			
Proje	ct							Client						Date Co	ompl	ietea
	Gra	ansmo	por ext	ensio	n 	<u> </u>		W. (Cliffo	ord Watts	s Limited			22/09	9/20	006
Proje	ct No.						Ground	Level (mAOD)	C0-	-ordinates	0			Boreno		Э.
	W(0/ПТ/1	403/0	1			1		-				B	H4	
Cont	ractor		1 1.					Location						Sneet	of 2	,
	Sit	e inve	estigatio	on Se	rvices			Eas			orksnire			· · · · · · · · · · · · · · · · · · ·		2
Ð									5		\				ē	nen
Sca	Redu Lev	iced /el	Dep (Thic nes	oth ck- s)						DESCF				Legend	Wa	Instru
1			- - - - - - - - - - - - - - - - - - -	80)	Loose gravel	brown is suba	slightly angular	sandy slightly grav to subrounded and	velly T d fine.	OPSOIL.	Sand is me	edium to coa	rse and			
			<u>-</u>	1.80										<u>ste ste</u>		Ň
2			- - - - - - -	20) 3.00	IS SUDI				ieaiun	n.						
4			(1.5	50) 4.50	Brown with oc	mediu casion	m to coa al claye	arse SAND and fin ay pockets	ie to n		ibrounded 1	o rounded G			4,1 <u>07</u> ,6,707,6,707,6,707,6,707,6,707,6,707	
5			(1.3	30) <u>5.80</u>	Brown	mediu	m to coa	arse SAND and fin	e to m	nedium st	Ibrounded 1	o rounded G		0000 0000 0000 0000 0000 0000 0000 0000 0000		
GRO	סטאס	WAT	FR	I				RFMA	RKS			NS	DRILI	<u> </u> ING		
Date	AM PM	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed			,			Plant: Dan Crew: perc E.G Type appa	ido 175 cable cussion drillin loring, J. Chr lyDiameter	e igrig ictie, / De	epth
								LOGGED B	Y		P. Mason					

P Technic	1 al advisers	on enviro		Ba M Ba Ba Sues Te Fa	a ddes ley C lain Road, axterley, Ai /arwickshir elephone: (acsimile: 0	olliery O Iherstone e, CV9 2 01827 71	πices, LE 7891 8507				BORE	IOLEI	LOG				
Proje	ct						T i uli	Cli	ent					÷	Date C	ompl	lete
	Gra	ansmo	oor ext	ensio	n				W.	. Clif	ford Watts Li	mited			22/0	9/20	006
Ргоје	ct No.	~	~ ~ .	4004	~ 4		Ground	Level ((maod)	C	o-ordinates ()				Boreno) .
0		SW/Y	0/11/1	403/0	01			1.	ootion						Shoet	-14	-
Cont	racior Site	e leve	etiaati	on Se	anvices			LO	cation Fa	et R	iding of Yorks	shire			2	of ?	R
	310		siyan		- VICES					15111	STRATA						, 2
Scale	Redu Lev	uced vel	Der (Thi	oth ck- ss)							DESCRIPT	10N			Legend	Water	Instrume
			[(D.	70)	Firm c fine to	lark red mediu	ddy brow im. (cont	/n sligh tinued)	tly graveli	y CL/	AY. Gravel is su	brounded to	rounded	and			00.00
			-	6.50			. <u></u>					, _, _,					0
			-		Stiff d fine.	ark red	dy brow	n slight	ily gravelly	/ CLA	Y. Gravel is sub	prounded to r	rounded	and			00000
7	2		- (1. -	00)													00,00
			-	7.50													0 0
			-		Stiff d	ark gre	y slightly	grave	IIY CLAY.	Grave	el is subrounded	d to rounded	and fine		·····		
			Ĩ													6 - C	2
8		1															
			-													1	
			-													6 1 2	
			-												<u> </u>	4 - CA	
			- -														
9			- 													A 102	i i i i i i i i i i i i i i i i i i i
			7													• • •	Ň
			-												Ĕ <u></u>	• IO	Š.
			-														
			-														
10			-		(ů.
10			-													-	Ĩ
			-	ļ											<u> </u>	0 1 02	ρ Δ
			-													-	ě
			(6.3	30)											<u> </u>		
			-														ŝ
11			-														ŝ
			-														
			-												노러		
			-														õ
			-														ŝ
	<u></u>		-					·			0 / 10/07 41 1	4710110		00011	<u></u>	,	ġ.
GR		VVA I Depth	⊏K Depth	Depth	Depth	Depth	Depth		KEM/	ARK	STINSTALL	ATIONS					
Date		Of	of	to	struck	after 20	sealed							Plant: Dano Crew: perci	ussion drillin	ç riq	
	FM	nole	casing	water		mins	+						ļ.		oring, J. Chr	istie, J	۵. ۳++
	i												-	i Abe sere	Plainetel	Je	pt
	1	ł				}		LO	GGED	BY	P.	Mason				{	
		1	1	1	1	1	1				1					1	

		on enviro		Ba Ma Ba Wi sues Te Fa	addesley C ain Road, axterley, Ai arwickshin lephone: (acsimile: 0	therstone e, CV9 2L 01827 717	fices, .E 7891			BOREHOLE LOG	;		
Proje	ct							Client		0		Date Co	omplet
	Gra	ansmo	oor ext	ensio	n			W. 0	Clif	ford Watts Limited		22/09	9/200
Proje	ct No.						Ground	Level (mAOD)		o-ordinates ()		Boreho	le No.
	WC	CW/Y	0/TT/1	403/0)1							B	H4
Cont	ractor			_				Location				Sheet	
	Site	e Inve	estigati	on Se	rvices			Eas	t R				of 3
ø										STRATA			er
Sca	Redu Lev	rel	Dep (Thi nes	oth ck- ss)						DESCRIPTION		Legend	Wat
13					(contir	nued)	, cigin,						2007,000,000,000,000,000,000,000,000,000
14			 	13.80 13.90	Soft da	ark gre m.	y very g	ravelly CLAY. Grav	vel i:	s subrounded to rounded and fine t	/		00,00
15			(2.	10)									
16			-	16.00	\\/bite					· · · · · · · · · · · · · · · · · · ·			000
			- (1.0	00)	vvinte	UNALI	× ·						
17			-	17.00	END C	OF BOR	EHOLE						
Í			- - - -										
GRC	DUND	WATI	ER					REMA	RK	S / INSTALLATIONS	DRILLI	NG	I
Date	AM PM	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed				Plant: Dand Crew: percu	o 175 cable Ission drillin	prig
											Type and	Diameter	Dept
						1		LOGGED B	Y	P. Mason			

DATE	20/09/03		BOREHOLE No. LOCATION	GA/03/ 01 E511280	W459853	Elevation 9.1 A.O.D.
			WRW			Drillers Log
		0.5	Good all the way down	n		Soil with gravel
		1.0				
		1.5				Yellow/Brown sand & gravel
		2.0				
-		2.5				Yellow/Brown sand & gravel
		3.0				
		3.5				Yellow/Brown sand & gravel
-		4.0				
		4.5				Yellow/Brown sand & gravel
		5.0				
[5.5				Brown silty sand with small & large gravels
		6.O				
		6.5				Brown silty sand with small & large gravels
		7.0				P
		7.5				Brown silty sand with small & large gravels
		8.O				2
		8.5				Brown silty sand with small & large gravels
		9.0				
		9.5				Brown silty sand with small & large gravels
		10.0				Hole Finished. (-0.9 A.O.D.) Borehole dry

DATE	20/09/03		BOREHOLE No. LOCATION	GA/03/ 02 E511313	W459871	Elevation 6.6 A.O.D.
	ļ		WRW			Drillers Log Top soil
		0.5				Light brown sandy clay
		1.0				
		1.5				
		2.0				
		2.5				
		3.0				
		3.5				
		4.0				
		4.5				
		5.O				
		5.5				
		6.0)			Dark brown silty sand
		6.5))Soft Sand			
		7.0)			
		7.5				
		8.O				Stiff brown boulder clay
		8.5				
		9.0				
		95				
		<i>ل</i> ه . م				
	L	10.0				Hole Finished. (-3.4 A.O.D.) Water at $6m (0.6 \text{ A.O.D.})$

tinter and the

at 6m (0.6 A.O.D.)

DATE	20/09/03		BOREHOLE No. LOCATION	GA/03/ 03 E511230 W45993	Elevation 7.4 A.O.D. 8
		0.5	WRW Silt		Drillers Log Top soil Brown sand with gravel 0.2
		1.0	Silt		Peat
		1.5			Orange brown sand with gravels
		2.0	Medium to coarse san	d	
		2.5			
		3.0	No sample		
		3.5			
		4.0	Soft to medium sand/c	coarse gravel	Soft brown sand
		4.5			
		5.0	Fine to medium sand -	- greyish	
		5.5			
		6.0	Fine to medium sand -	- greyish	
		6.5			
		7.O	Fine to medium sand .	- greyish	Sand with chalk gravels
		7.5			
		8.0	Fine to medium sand -	- greyish	
		8.5			
		9.0	Medium sand		
		9.5			
		10.0	Coarse sand to grit wi	th gravel	Hole Finished. (-3.6 A.O.D.) Water at 4m (3.4 A.O.D.)

~	DATE	20/09/03		BOREHOLE No. LOCATION	GA/03/ 04 E511344	W459999	Elevation 7.1 A.O.D.
				WRW			Drillers Log
			0.5	Outlying surface depo	sit only		
			1.0				Brown boulder clay
			1.5				
			2.0				
			2.5				
			3.0				
			3.5				
			4.0				
			4.5				
			5.O				
			5.5				
			6.O				
			6.5				
			7.0				Hole Finished Borehole dry

DATE	20/09/03		BOREHOLE No. LOCATION	GA/03/ 05 E511218 W459927	Elevation 7.5 A.O.D.
	1		WRW		Drillers Log Top soil
		0.5	Soft sand		Light brown sand & gravel (0.4)
		1.0	? & sand		
		1.5			Peat over sand & some gravel (1.8)
		2.0	Dark soft sand		
		2.5			
		3.0	Dark soft sand		
		3.5			
		4.0	Dark soft sand		Yellow brown silty sand with gritty gravels.
		4.5			
		5.O	Dark soft sand		
		5.5			
		6.0	Medium sand to grave	əł	
		6.5			
		7.0	Medium sand to coars	e gravel	
		7.5			
		8.O	Medium sand to grave		
		8.5			
	ĺ	9.0	Medium sand to big g	Tavel	
)	9.5			
		10.O			Hole Finished (-2.5 A.O.D.) Water at 4m (3.5 A.O.D.)

" DATE	20/09/03		BOREHOLE No. LOCATION WRW	GA/03/ 06 E511198	W459974	Elevation 10.2 A.O.D. Drillers Log
		0.5	soil			Top son
		1.0	no sample			
		1.5				
		2.0	Soft sand			Brown gritty sand
		2.5				
		3.0	Soft sand			
		3.5				
μ.		4.0	Soft sand			Soft brown sand
		4.5				•
		5.0	Soft sand			
		5.5				
		6.O	Soft sand			Brown coarse sand with small gravels & grit.
		6.5				
		7.0	Soft sand			
		7.5				
		8.O	Coarse sand/fine grav	el		
		8.5				
		9.O	Very coarse sand/grav	/el		
		9.5				
		10.O				Hole Finished. (0.2 A.O.D.) Water at 4m (6.2 A.O.D.)

DATE	20/09/03	ł	BOREHOLE No. LOCATION WRW	GA/03/ 07 E511173	W459974	Elevation 6.9 A.O.D. Drillers Log Top soil
		0.5	Bad fine sand			Large gravels (0.4)
		1.0	Bad fine sand			Brown medium sands
		1.5				
		2.0	Bad fine sand			
		2.5				
		3 <i>.</i> O	Bad fine sand brown	to grey		
		3.5				
		4.0	Bad fine sand brown	to grey		
		4.5				
		5.O	Bad fine sand brown t	to grey		Coarse brown sand with grit & gravels
		5.5				
		6.O	Bad fine sand / coarse	e grit		
		6.5				
		7.0	Bad fine sand / coarse	e grit		
		7.5				
		8.O	Silt			
		8.5				
		9.0	Very coarse very wet	sharp with 5	to 8mm	
		9.5				·
		10.O				Hole Finished. (-3.1 A.O.D.) Water at 5m (1.9 A.O.D.)

~	DATE	20/09/03		BOREHOLE No. LOCATION	GA/03/ 08 E511217 W459975	Elevation 7.7 A.O.D.
				WRW		Top soil over brown clay
			0.5			
			1.0			
			1.5			
			2.0			
			2.5			
			3.0			
			3.5			
-			4.0			
			4.5			
			5.0	Fine to medium sand little gravel	brown with a	
			5.5			
			6.O	Fine to medium sand little gravel	brown with a	Brown medium sand
			6.5			
			7.0	Very fine sand/coarse	egravel	
			7.5			
			8.0	Fine sand/coarse grav	el	
.			8.5			Brown sharp sand with grit & gravels
			9.O	Grit sand no -2mm	(-1.8 A.O.D.)	
			9.5	No sample		Brown clay
			10.O			Hole Finished. (-2.3 A.O.D.) Water at 6m (1.7 A.O.D.)

	DATE	20/09/03		BOREHOLE No. LOCATION	GA/03/ 09 E511261	W460087	Elevation 8.2 A.O.D.
		1		WRW			Drillers Log Top soil
			0.5				Brown boulder clay
			1.0				-
			1.5				
			2.0				
			2.5				
			3.0				
			3.5				
-			4.0				
			4.5				
			5.O				
			5.5				
			6.O				
			6.5				
			7.0				Hole Finished Borehole dry

~	DATE	20/09/03		BOREHOLE No. LOCATION	GA/03/10 E511192 W460067	Elevation 6.9 A.O.D.
	1	1		WRW		Drillers Log Top soil
			0.5	Silty sand		Brown soft sand (0.3)
			1.0	Silty sand		
			1.5			
			2.0	Silty sand		
			2.5			
			3.O	Silty sand		
			3.5			
~			4.O	Silty sand	(2.9 A.O.D.)	Soft gray silty clay
			4.5			
			5.0			
			5.5			
			6.O			
			6.5			
			7.0			
			7.5			
	Į		8.O			Hole Finished Moist at 4m

*	DATE	20/09/03		BOREHOLE No.	GA/03/11 E511230	W460105	Elevation 10.4 A.O.D.
	1	1		WRW	0311200		Drillers Log Top soil over brown boulder clay
			0.5				
			1.0				
			1.5				
			2.0				
			2.5				
			3.0				
			3.5				
			4.0	Fine sand			Brown gritty sand
			4.5	Fine yellow sand			Brown sand with gravels
			5.0	Fine yellow sand			
			5.5				
			6.0	soft sand, coarser with	n a little grav	vel	
			6.5				
			7.0	medium soft sand wit	h a little gra	vel	
			7.5				
			8 .O	medium sharp sand w	rith gravel		
			8.5				
			9.0	medium soft sand wit	h a little gra	vel	
			9.5				
			10.0				Borehole Finished (0.4 A.O.D.) Water at 4.5m (5.9 A.O.D.)

	DATE	20/09/03		BOREHOLE No. LOCATION WRW	GA/03/ 12 E511165 W460157	Elevation 7.5 A.O.D. Drillers Log
			0.5	Poor quality bad sand		
			1.0	Poor quality bad sand		
			1.5			
			2.0	Poor quality bad sand		
			2.5			
			3.O	Fine sand with a little	gravel	Brown coarse sandwith gravels
			3.5			
.			4.0	Coarse fine sand with	a little gravel	
			4.5			
			5.0	Fine sand with a lot of 30% plus 5mm	fgravel 5-20mm	
			5.5			
			6.O	Medium/fine sharp sa 20% plus 5mm to15/2	nd with gravel Omm	
			6.5			
			7.0	Medium/fine sharp sa 20% plus 5mm to15/2	nd with gravel Omm	
			7.5			
	1		8 .O	Medium/fine sharp sa 20% plus 5mm with b	nd with gravel igger gravel than above	e
r.			8.5			
			9.0	Coarse sharp sand/gra	vel	
			9.5			
			10.O			Borehole finished. (-2.5 A.O.D.) Borehole dry

¥.	DATE	20/09/03		BOREHOLE No. LOCATION WRW	GA/03/ 13 E511074 W460147	Elevation 8.2 A.O.D. Drillers Log Brown sand
			0.5			Diowir Suite
			1.0	Fine to medium soft b	brown sand	
			1.5			
			2.0	Fine clean sand		
			2.5			•
			3.O	Fine clean sand		Brown sand with grit
			3.5			not graver with deput.
ø			4.0	Fine clean sand		
		i	4.5			
			5.0	Fine clean sand		
			5.5			
			6.O	Fine clean sand		
			6.5			
			7.O	Fine clean sand with	grit	
			7.5			
			8.O	Medium sand with a	little gravel	
,			8.5			
			9.O	Medium sand with 30	0%gravel to 20mm	
	ĺ		9.5			
			10.O			Borehole Finished. (-1.8 A.O.D.)

~	DATE	20/09/03	0.5	BOREHOLE No. LOCATION WRW Bad yellow sand/silt	GA/03/ 14 E510985	W460161	Elevation 10.6 A.O.D. Drillers Log Top soil Brown medium sand (0.4)
			1.0	Bad yellow sand/silt			
			1.5				
			2.0	Bad yellow sand/silt			
			2.5				
			3.0	Bad yellow sand/silt			
			3.5				
_			4.O	Bad yellow sand/silt			Brown sandwith small gravels
			4.5				
			5.0	Bad yellow sand/silt			
			5.5				
			6.O	Bad yellow sand/silt			
			6.5				
			7.0	Bad yellow sand/silt			
			7.5				
			8.0	Silty sand			
-			8.5		10		
			9.0	weatum sand/grit, sor	ne tomm		
			10.O				Borehole Finished, (40.6 A.O.D.)
	1		. –				Water at 6m (4.6 A.O.D.)

~	DATE	20/09/03		BOREHOLE No. LOCATION WRW	GA/03/ 15 E510990	5 W460116	Elevation 10.1 A.O.D. Drillers Log
			0.5				Top soil over brown clayey sand
			0.0				
			1.0	Yellow silty sand			
			1.5				
			2.0	Yellow silty sand			Peaty sand
			2.5	Bad sand			
			3.0	Bad sand			Brown silty sand with grit
			3.5				
			4.O	silty yellow to brown	fine sand		
			4.5				
			5.O	silty yellow to brown	fine sand		
			5.5				
			6.O	silty yellow to brown	fine sand		
	:		6.5				
			7 .O	silty yellow to brown	fine sand		
•			7.5				(11 A O D)
			8 .O	U/S			(2.1 A.O.D.)
			8.5				
-			9.0				
			9.5				
			10.O				Borehole Finished. (0.1 A.O.D.) Water at 3m (7.1 A.O.D.)

•

.	DATE	20/09/03	1	BOREHOLE No. LOCATION WRW	GA/03/16 E510933 W460	Elevation 8.8 A.O.D. 148 Drillers Log
			0.5	soft sand/gravel		Top soil Brown medium sand over soft sand (0.4)
			1.0	soft sand		Sand (0.4)
			1.5			
			2.0	soft/medium sand		
			2.5			
			3.O	soft/medium sand		
			3.5			
.			4.O	soft/medium sand		Brown gritty sand with occasional gravels
			4.5			
			5.0	soft/medium sand		
			5.5			
			6.O	soft/medium sand with	n gravel	
			6.5			
			7.0	soft/medium sand with	i gravel	
			7.5	• <i>/</i> •		
			8.0	coarse sand/gravel		
			8.5	14/1		
-			9.0	coarse gni/gravel		
			10.0			Rorahola Finishad (1740B)
	L		10.0			borenoie r misneu. (-1.2 A.O.D.)

	DATE	20/09/03		BOREHOLE No. LOCATION WRW Yellow soft sand	GA/03/ 17 E510996	W460099	Elevation 6.7 A.O.D. Drillers Log Top soil & gravel
			0.5	Vallow off sand			sand (0.6)
			1.0	I CHOW SOIL Saild			
			2.0	Vellow soft sand			
			2.0	TONOW SOLE SUING			
			3.0	Yellow soft sand			
			3.5				
			4.0	Yellow soft sand			Soft sand
i i			4.5				
			5.0	Medium sand/gravel			
			5.5				
			6.0	Medium sand/gravel			
			6.5				
			7.0	Soft medium sand			
			7.5				
			8.O	Sharp sand/gravel			
			8.5				
~			9.0	Sharp sand/gravel			
			9.5				
			1 0 .O				Borehole Finished. (-3.3 A.O.D.)


APPENDIX C – MSDS Sheet for Clearflo Flocculent



CLEARFLO NP1846-1

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product Identifier:

1.2

1.3

- Trade Name:	CLEARFLO NP1846-1	
- Type of product:	Mixture	
Relevant identified used of the substance	or mixture and uses advised against:	
- Identified Uses:	Processing aid for industrial applications	
- Uses advised against:	None	
Details of the supplier of the safety data sheet:		
Supplier:	GPC CLEAR SOLUTIONS LIMITED Unit 57 Riverside Estate Sir Thomas Longley Road Medway City Estate Rochester Kent ME2 4DP United Kingdom	
Telephone Number: Mobile:	+44 (0) 1634 326920 +44 (0) 7787564967	

Email:

sales@gpcclearsolutions.co.uk

1.4 Emergency Telephone Number (Office hours only):

GPC Clear Solution Ltd (Office hours only): +44 (0) 7787564967

National Poison Information Service:	NHS Direct: 0845 4647 or 111 (24/24, 7/7)
	Scotland: NHS 24-08454 24 24 24 (24/24, 7/7)



CLEARFLO NP1846-1

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:			
	-	Classification according to Regulation (EC) No. 1272/2008:	Not classified.
2.2	Lab	el elements:	
	-	Hazard pictogram(s):	None.
	-	Signal word:	None.
	-	Hazard statement(s):	None.
	-	Precautionary statement(s):	None.
	-	Additional elements:	None.
2.3	Oth	er hazards:	Aqueous solutions or powders that become wet render surfaces extremely slippery.
	-	PBT and vPvB assessment:	Not PBT or vPvB according to the criteria of Annex XIII of REACH.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1	Substances:	Not applicable, this product is a mixture.
3.2	Mixtures:	
	- Hazardous components:	Contains no reportable hazardous substances.



CLEARFLO NP1846-1

4. FIRST AID MEASURES

4.1 Description of first aid measures:

- Inhalation:	Move to fresh air. No hazards which require first aid measures.
- Skin contact:	Wash off with soap and plenty of water. Get medical attention if irritation develops and persists.
- Eye contact:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In case of persistent eye irritation, consult a physician.
- Ingestion:	Rinse mouth with water. Do NOT induce vomiting. Get medica attention if symptoms occur.
Most important symptoms and effects, both	
acute and delayed:	Powder can cause localised skin irritation in folds of the skin or under tight clothing. Moderate eye irritation due to effects all powders have on conjunctivae.
Indication of any immediate medical attention	
and special treatment needed:	None reasonably foreseeable.
- Other information:	Aqueous solutions or powders that become wet render surfaces extremely slippery.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media:

4.2

4.3

-	Suitable extinguishing media:	Water. Water spray. Foam. Caron dioxide (CO2). Dry powder. Warning! Aqueous solutions or powders that become wet render surfaces extremely slippery.
-	Unsuitable extinguishing media:	None known.

Page 3 of 11



5.2

6.2

6.3

SAFETY DATA SHEET

CLEARFLO NP1846-1

5.2 Special hazards arising from the substance or mixture:

-	Hazardous decomposition products:	Thermal decomposition may produce: nitrogen oxides (NOx), carbon oxides (COx). Ammonia (NH3). Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combustion in an oxygen deficient atmosphere.
Ac	lvice for firefighters:	
-	Protective measures:	In the event of fire, wear self-contained breathing apparatus.
-	Other information:	Aqueous solutions or powders that become wet render surfaces extremely slippery.

6. ACCIDENTAL REALEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

- Personal precautions:	Aqueous solutions or powders that become wet render surfaces extremely slippery.	
- Protective equipment:	Wear adequate personal protective equipment (See Section 8 Exposure Controls/Personal Protection).	
- Emergency procedures:	Keep people away from spill/leak. Prevent further leakage or spillage if safe to do so.	
Environmental precautions:	As with all chemical products, do not flush into surface water.	
Methods and material for containment and cleaning up		
- Small spills:	<u>Do not flush with water.</u> Clean up promptly by sweeping or vacuum. Keep in suitable, closed containers for disposal.	
- Large spills:	<u>Do not flush with water.</u> Clean up promptly by sweeping or vacuum. Keep in suitable, closed containers for disposal.	

- Residues: <u>After cleaning</u>, flush away traces with water.



CLEARFLO NP1846-1

7. HANDLING AND STORAGE

7.1	Precautions for safe handling:	Aqueous solutions or powders that become wet render surfaces extremely slippery. Use personal protective equipment.
7.2	Conditions for safe storage, including any incompatibilities:	Incompatible with strong bases and oxidizing agents.
7.3	Specific end use(s):	This information is not available.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control parameters:

-	National occupational exposure limits:	None known.

- Derived No and Minimum Effect Levels (DNELs/DMELs):
- Predicted no-effect concentrations (PNEC):

8.2 Exposure controls:

Appropriate engineering controls:

Individual protection measures, such as personal protective equipment:

a)	Eye/fac	e protection:	Safety glasses with side-shields. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).
b)	Skin protection:		
	i)	Hand protection:	PVC or other plastic material gloves. The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it.

in absence of dusts.

None known.

None known.

Use local exhaust if dusting occurs. Natural ventilation is adequate



CLEARFLO NP1846-1

	ii)	Other:	Work clothes protecting arms, legs and body. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
c)	Respirat	ory protection:	No personal respiratory protective equipment normally required. Dust safety masks recommended where working powder concentration is more than 10 mg/m ³ . Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
d)	Addition	nal advice:	Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. Wash hands before breaks and at the end of workday.
Env	ironment	tal exposure controls:	Do not allow uncontrolled discharge of product into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

_

9.1 Information on basic physical and chemical properties:

-	Appearance:	Granular solid, white.
-	Odour:	None.
-	Odour Threshold:	Not applicable.
-	pH:	5 – 9 @ 5 g/L (See Technical Bulletin or Product Specifications for a more precise value, if available).
-	Melting point/freezing range:	> 150°C
-	Initial boiling point and boiling range:	Not applicable.
-	Flash point:	Not applicable.
-	Evaporation rate:	Not applicable.
-	Flammability (solid, gas):	No data available.
-	Upper/lower flammability or explosive limits:	Not expected to create explosive atmospheres.
-	Vapour pressure:	Not applicable.



CLEARFLO NP1846-1

-	Vapour density:	No applicable.
-	Relative density:	0.6 – 0.9 (See Technical Bulletin or Product Specifications for a more precise value, if available).
-	Solubility(ies):	Soluble in water.
-	Partition coefficient:	-2
-	Autoignition temperature:	Does not self-ignite (based on the chemical structure).
-	Decomposition temperature:	> 150°C
-	Viscosity:	See Technical Bulletin.
-	Explosive properties:	Kst = 0 Non-flammable to ignition sources of less than 2.5 kJ.
-	Oxidizing properties:	Not expected to be oxidising based on the chemical structure.
Other information:		None.

10. STABILITY AND REACTIVITY

9.2

10.1	Reactivity:	None known.	
10.2	Chemical stability:	The product is stable under normal storage conditions.	
10.3	Possibility of hazardous reactions:	Oxidising agents may cause exothermic reactions. Contact with strong bases liberates ammonia.	
10.4	Conditions to avoid:	None known.	
10.5	Incompatible materials:	Incompatible with strong bases and oxidising agents.	
10.6	Hazardous decomposition products:	Thermal decomposition may produce: nitrogen oxides (NOx), carbon oxides (COx). Ammonia (NH3). Hydrogen cyanide (hydrocyanic acid) may be produced in the event of combustion in an oxygen deficient atmosphere.	



CLEARFLO NP1846-1

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Information on the product as supplied:

-	Acute oral toxicity:	LD50/oral/rat > 5000 mg/kg
-	Acute dermal toxicity:	LD50/deraml/rat > 5000 mg/kg
-	Acute inhalation toxicity:	The product is not expected to be toxic by inhalation.
-	Skin corrosion/irritation:	Not irritating.
-	Serious eye damage/eye irritation:	Not irritating.
-	Respiratory/skin sensitisation:	Not sensitizing.
-	Mutagenicity:	Not mutagenic.
-	Carcinogenicity:	Not carcinogenic.
-	Reproductive toxicity:	Not toxic for reproduction.
-	STOT – Single exposure:	No known effects.
-	STOT – Repeated exposure:	No known effects.
-	Aspiration hazard:	No hazards resulting from the material as supplied.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Information on the product as supplied:

- Acute toxicity to fish:

LC50/Danio rerio/96 hours > 100 mg/L (OECD 203) LC50/Fathead minnow/96 hours > 100 mg/L (OECD 203)

Page 8 of 11

Revision date: 05/06/2020



CLEARFLO NP1846-1

	- Acute toxicity to invertebrates:	EC50/Daphnia magna/48 hours > 100 mg/L (OECD 202)
	- Acute toxicity to algae:	IC50/Scenedesmus subspicatus/72 hours > 100 mg/L (OECD 201)
	- Chronic toxicity to fish:	No data available.
	- Chronic toxicity to invertebrates:	No data available.
	- Toxicity to microorganisms:	No data available.
	- Effects on terrestrial organisms:	No known effects.
	- Sediment toxicity:	No data available.
12.2	Persistence and degradability	
	Information on the product as supplied:	
	- Degradation:	Not readily biodegradable.
	- Hydrolysis:	Does not hydrolyse.
	- Photolysis:	No data available.
12.3	Bioaccumulative potential	
	Information on the product as supplied:	
	- Partition co-efficient (Log Pow):	-2
	- Bioconcentration factor (BCF):	~0
12.4	Mobility in soil	
	Information on the product as supplied:	None.
12.5	Results of PBT and vPvB assessment:	
	- PBT assessment:	Not PBT according to the criteria of Annex XIII of REACH.
	 vPvB assessment: 	Not vPvB according to the criteria of Annex XIII of REACH.
12.6	Other adverse effects:	None known.
	Page 9 of 11	Revision date: 05/06/2020



CLEARFLO NP1846-1

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods:

-	Waste from residues/unused products:	Dispose in accordance with local and national regulations. Can be landfilled or incinerated, when in compliance with local regulations.
-	Contaminated packaging:	Rinse empty containers with water and use the rinse-water to prepare the working solution. If recycling is not practicable, dispose of in compliance with local regulations. Can be landfilled or incinerated, when in compliance with local regulations.
-	Recycling:	In accordance with local and national regulations.

14. TRANSPORT INFORMATION

14.1	Land transport (ADR/RID):	Not classified.
14.2	Sea transport (IMDG):	Not classified.
14.3	Air transport (IATA):	Not classified.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the substance or mixture:

All components of this product have been registered or pre-registered with the European Chemicals Agency or are exempt from registration

15.2 Chemical Safety Assessment:

A chemical safety assessment for this product has been carried out by the person responsible for producing this Safety Data Sheet. All relevant information used to conduct this assessment are included in this Safety Data Sheet as well as any resulting Risk Reduction Measures



CLEARFLO NP1846-1

16. OTHER INFORMATION

16.1 This data sheet contains changes from the previous version in section(s):

SECTION 8: Exposure controls/personal protection, SECTION 16: Other information

16.2 Key or legend to abbreviation and acronyms used in the safety data sheet:

Acronyms

PBT = persistent, bioaccumulative and toxic STOT = Specific target organ toxicity vPvB = Very persistent and very bioaccumulative

16.3 Training advice:

Do not handle until all safety precautions have been read and understood

16.4 This SDS was prepared in accordance with the following:

Regulation (EC) \aleph 1907/2006, as amended Regulation (EC) \aleph 1272/2008, as amended

Version: 20.01.b

PRAC001

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only a guidance for safe handling, use, process, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.

ANNEX(ES)

This product is not hazardous as supplied and/or does not contain hazardous components:

- . Which require REACH registration; or,
- . which demonstrate relevant effects which would require a chemical safety assessment; or,
- . which are present at concentrations above their cut-off value

Therefore, according to Regulation (EC) No 197/2006, Article 31, paragraph 7, an Exposure Scenario is not required as an annex to the Safety Data Sheet