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ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING, QUARRYING AND MINERAL ESTATES
WASTE RESOURCE MANAGEMENT



LLOYDS QUARRIES LIMITED

Maes Mynan Quarry

Application for Environmental Permit

Hydrogeological Risk Assessment

October 2011

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1 INTRODUCTION

1.1 Maes Mynan Quarry is an existing sand quarry located at Denbigh Road, Afonwen, Clwyd. The site is 60 hectares with permission for the extraction of some 2,900,000 tonnes of sand. Approximately 185,000 tonnes of sand is extracted each year.

1.2 This risk assessment draws on observations during site walkovers, historical records relating to the exemption at the site and the Environment Agency "What's in your backyard".

2 GEOLOGY AND HYDROGEOLOGY

2.1 The quarry is located within glacial sands and gravels which are designated as a Secondary A Aquifer. The bedrock is designated as a Secondary B Aquifer. The site is not in a source protection zone.

2.2 It is understood that the water table lies close to the base of the quarry at 72m AOD. There has been groundwater ingress into some of the older and deeper parts of the site. These areas are now fully restored incorporating a lake and wildlife habitat.

2.3 Future extraction will be to a maximum depth of 73m AOD. This will ensure that there is an unsaturated zone of at least 0.5m between the groundwater and any imported material. There will be no disruption to local groundwater flow within the area.

3 PROTECTING GROUNDWATER

3.1 Clearly there is a need to restore the quarry. It is expected that this will be completed using some virgin overburden materials extracted from the quarry. This overburden has been stockpiled on site for the purpose. The restoration will require an additional 585,000 tonnes of material in order to achieve the finished levels agreed with the Local Planning Authority. Inert waste will be imported to complete this part of the restoration.

3.2 Imported material will consist only of inert waste. There is the potential for an indirect discharge to groundwater should contaminated materials be accepted at the site. For this reason there will be careful waste acceptance procedures in place to confirm the inert nature of all imported materials.

3.3 Waste types are predominantly based on those contained in Standard Rules for the Use of Waste in Reclamation, Restoration or Improvement of Land and will be restricted to those shown in Table 1.

TABLE 1

WASTE FOR USE IN RESTORATION AT MAES MYNAN QUARRY

01	**WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS**
01 01	**Wastes from mineral excavation**
01 01 01	Waste from mineral metalliferous excavation
01 01 02	Waste from mineral non-metalliferous excavation
01 03	**Wastes from physical and chemical processing of metalliferous minerals**
01 03 06	Tailings other than those mentioned in 01 03 04 and 01 03 05
01 03 09	Red mud from alumina production other than the wastes mentioned in 01 04 07
01 04	**Wastes from physical and chemical processing of non-metalliferous minerals**
01 04 08	Gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	Waste sand and clays
02	**WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING**
02 04	**Wastes from sugar processing**
02 04 01	Soil from cleaning and washing beet
03	**WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD**
03 03	**Wastes from pulp, paper and cardboard production and processing**
03 03 05	De-inking sludges from paper recycling only for use on top restoration layer as growing medium)
10	**WASTES FROM THERMAL PROCESSES**
10 01	**Wastes from power stations and other combustion plants (except 19)**
10 01 01	Bottom ash and slag only
10 01 02	Pulverised fuel ash only
10 12	**Wastes from manufacture of ceramic goods, bricks, tiles and construction products**
10 12 08	Waste ceramics, bricks, tiles and construction products (after thermal processing)
10 13	**Wastes from manufacture of cement, lime and plaster and articles and products made from them**
10 13 14	Waste concrete and concrete sludge
15	**WASTE PACKAGING**

TABLE 1 WASTE FOR USE IN RESTORATION AT MAES MYNAN QUARRY	
15 01	**Packaging (including separately collected municipal packaging waste)**
15 01 07	Glass packaging
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**
17 01	**Concrete, bricks, tiles and ceramics**
17 01 01	Concrete
17 01 02	Bricks
17 01 03	Tiles and ceramics
17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02	**Wood, glass and plastic**
17 02 02	Glass
17 05	**Soil, stones and dredging spoil**
17 05 04	Soil and stones, including chalk, other than those mentioned in 17 05 03
17 05 06	Dredging spoil other than those mentioned in 17 05 05
17 05 08	Track ballast, other than those mentioned in 17 05 07
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**
19 08	**Wastes from waste water treatment plants not otherwise specified**
19 08 02	Washed sewage grit (waste from desanding only)
19 12	**Wastes from the mechanical treatment of waste (e.g. sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 05	Glass (for fill purposes only, not for use in restoration top layer)
19 12 09	Minerals (for example sand and stones)
19 12 12	Soil substitutes other than that containing dangerous substances
19 13	**Waste from soil and groundwater remediation**
19 13 02	Solid wastes from soil remediation other than those mentioned in 19 13 01
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**
20 01	**Separately collected fractions (except 15 01)**
20 01 02	Glass (for fill purposes only, not for use in restoration top layer)
20 02	**Garden and park wastes (including cemetery waste)**
20 02 02	Soil and stones, only from gardens and parks.

3.4 Any waste that does not appear on the list of inert wastes acceptable without testing, within the ruling of Council Decision 2003/33/EC, will be subject to pre-acceptance testing to demonstrate that it meets WAC for inert landfills.

3.5 All incoming wastes will be inspected, prior to use on site, to ensure they are in line with the pre-acceptance testing and duty of care paperwork. Periodic sampling will be carried out to confirm the analysis of wastes subject to testing. Full details of the waste acceptance procedures that will be in place are detailed in the Waste Recovery Plan.

4 RISK ASSESSMENT

4.1 The waste acceptance procedures outlined above will ensure that the only waste accepted into the site will be inert. There is thus very little leaching potential and the site will not generate leachate that might contaminate groundwater. This absence of contaminating material within incoming waste will mean that there is no risk to water resources as there is no source of potential contaminants.