

Glyn Rhonwy Pumped Storage Development Consent Order

Deadline 5 – Outline Ordnance Management Strategy



PINS Reference	EN010072	
Document Nos.	SPH_GREX_DCOD4_01 (rev 1)	
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Revision	Date	Description
1	21/06/2016	Issued

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1 Introduction

- 1.1.1 This document set-outs the basic framework of processes and plans for the mitigation of risk from potential Unexploded Ordnance (UXO) hazards to construction of the Glyn Rhonwy Pumped Storage scheme (hereby referred to as the Development) near Llanberis, North Wales.
- 1.1.2 The strategy details the typical techniques and approaches that could be implemented by the Ordnance management contractor to ensure the operations are undertaken safely, with minimal disruption to the local community.
- 1.1.3 The definitive Ordnance Management Strategy will be produced once the final construction design and proposed methods are devised and all other related risk assessments are complete.
- Once appointed, the PC and UXO contractor will together develop a detailed construction plan including construction phasing, working areas and method statements.
 - Once finalised the OMS will be agreed with Gwynedd Council.
 - The OMS will focus on the known UXO risks at the site, but will also outline processes for the discovery and handling of unexpected UXO material.
 - The UXO contractor will develop detailed task and area specific risk assessment method statements (RAMS), and these will be overseen by the CDMC.
 - Construction workers will be fully briefed on UXO risk and the specific RAMS for the task they are carrying out and area they are working in.
- 1.1.4 The OMS will at all times remain a live document that can be updated in response to ground conditions.

1.2 Requirement

- 1.2.1 A detailed UXO desk study and risk assessment undertaken by Zetica (Report ref: P3300-12-R1-C) identified the potential for ordnance to be present within Quarry 6 (Q6) of the Development, which was used during and immediately after World War Two (WWII) for extensive ordnance disposal operations.
- 1.2.2 Q6 is planned to be the location of a storage reservoir for the Development and a dam is to be constructed at the surface of the quarry.
- 1.2.3 It is understood that this will require the removal of a significant amount of slate waste from Q6, the draining of water current present and potentially the lining of the base of the proposed reservoir. During all these activities there is the potential to encounter UXO.
- 1.2.4 It is therefore important to put in place an Ordnance Management Strategy to ensure that the UXO hazard is appropriately addressed.
- 1.2.5 The main focus of this strategy will be to protect personnel involved in construction, the public, property, environment and those directly involved in the Explosive Ordnance Clearance (EOC) and Disposal (EOD) operations.

2 Method

- 2.1.1 Although no detailed construction plans are yet available, the Ordnance Management Strategy is expected to comprise of several phases of work as typically used for other similar projects in the UK, focusing on ensuring the development goes ahead safely and, where appropriate, that the UXO hazard is removed.
- 2.1.2 Typically these phases comprise:-
- Detailed UXO hazard identification – To provide further input into the risk assessment and method of EOD ensuring that any EOD operation is appropriately prepared for.
 - UXO mapping – Where appropriate, the location of individual items and groups of UXO will be mapped through visual/detection techniques as appropriate.
 - Explosive Ordnance Clearance – Investigation and identification of UXO in order to determine the hazard and whether they are required to be made safe.
 - Explosive Ordnance Disposal – Making safe of any hazardous UXO.
- 2.1.3 Where safe to do so, any UXO risk mitigation works can be undertaken in conjunction with the main construction works. This not only reduces costs and programme but also the requirement to mobilise additional plant or materials.
- 2.1.4 It should be noted that at every stage of the mitigation works, task specific risk assessment method statements (RAMS) will be produced by the Ordnance Management Contractor that provide details of the work practices and approach, alongside contingencies relevant to the types of work being conducted. The UXO contractor will specify the analytical suite to be applied

to water samples in Q6. Water quality test results (conducted as part of the certified Water Management Plan) will be made available to the Ordnance Management Contractor to further inform the OMS and RAMS.

2.2 UXO Hazard Identification

2.2.1 As detailed in the desk study and risk assessment, there is the potential for a wide variety of UXO types to be present in Q6. These range in size from small detonators, fuzes and bullets up to large High Explosive (HE) bombs. There is also likely to be quantities of ordnance scrap in Q6 which, whilst inert, will need positive identification prior to removal.

2.2.2 As part of the detailed risk assessment prior to any ordnance operations, a full assessment of both whole and component parts of ordnance likely to be present will be undertaken in order to further assess the nature, likely hazard and appropriate disposal action on encounter. This will consider:-

- Identifying marks/details;
- Size;
- Nature of filling;
- Quantity of filling;
- Nature of fusing;
- Possible variations;
- Age and condition;
- Probability of operating intended; and
- Incompatibility with other ordnance.

2.2.3 Alongside the UXO mapping results, this will inform the EOD operation planning.

2.2.4 The risk assessment will be finalised on confirmation of the construction methods and updated and revised throughout the EOC operations based on the types/quantities/locations of any UXO discoveries.

2.3 UXO Mapping

- 2.3.1 Depending on practicality, a combination of UXO detection and observational mapping will be undertaken in order to provide location and potential quantity verification of UXO prior to any investigation works.
- 2.3.2 Some characterisation of either location and/or concentration of metallic targets will enable detailed planning for preparation on a daily basis, ensuring that appropriate resource is in place at each stage of any EOD operation.
- 2.3.3 A targeted non-intrusive magnetometer survey could be undertaken to detect the potential extents of any UXO within the slate waste and therefore inform the subsequent investigation phase. This would be undertaken by an EOC team (see below).

2.4 Explosive Ordnance Clearance

- 2.4.1 As part of the construction phase of works, potential UXO will be investigated and assessed by the EOC Engineer to determine whether they are live, inert or non-UXO. Anything inert or non-UXO will be removed as 'scrap'.
- 2.4.2 Live/hazardous UXO will be subject to an EOD operation either in-situ or relocated to a purpose-built EOD facility for disposal.
- 2.4.3 The EOC Engineer will be fully briefed on the EOD tasking protocol for this project. All tasks will be reported and a record of the time and detailed maintained.
- 2.4.4 Subject to the methods proposed, this clearance phase is planned to be an integrated activity during construction, reducing any impact and utilising common resources where required.
- 2.4.5 A range of other protective measures will be put in place which may be required to include:-
- Active detection during material movement;
 - Enforced man limits;
 - Protective materials for plant; and

- PPE for staff.

2.5 Explosive Ordnance Disposal

- 2.5.1 EOD operations will be undertaken by trained and experienced staff that have appropriate competencies in conjunction with recognised UK best practice endorsed by HSE, MoD, MCA and crown estates.
- 2.5.2 Liaison with authorities such as the MoD and Police will be maintained to keep them informed of the operation and to allow them to reassure the local community in the event of any enquiries.
- 2.5.3 An EOD facility will be established on site prior to any investigation works. This would remain in place throughout the development.
- 2.5.4 The exact design of the EOD facility will be governed by the anticipated types of ordnance and site location. Typically EOD facilities are of tried and tested designs comprising of a surrounding blast mitigation structure with sand or water suppression barriers with an airgap. This means that any blast is not only contained, but also any significant noise.
- 2.5.5 Such facilities mean that there is no disruption to the local community.



Figure 1: Typical EOD Facility

- 2.5.6 The proposed location of an EOD facility will be determined once a contractor has been appointed and the programme for construction has been developed. The location of the facility will be selected taking into consideration distance from properties and construction activities in accordance with the Works Plans within the Development Consent Order.
- 2.5.7 In the unlikely event that an item is deemed unsafe to move and requires disposal in-situ the same mitigation principle will be adopted as for the fixed disposal facility outlined above. This will involve placing a sufficient quantity of blast mitigation over the item to suitably mitigate the effects of the blast, fragmentation and noise from the UXO detonation. Again an evacuation of nearby properties would not be anticipated.
- 2.5.8 Provisions will also be made for the unlikely scenario in which Mustard Gas or other suspected chemical-filled munitions are found. In such a situation, the suspect item will be segregated, a safety cordon put in place and the

Defence CBRN Centre at Winterbourne Gunner will be contacted to arrange for its disposal, as per standard UK protocols.

2.5.9 As a precaution, appropriate Personal Protective Equipment (PPE) will be used to protect staff against such hazards if they are deemed to be potentially present.

2.6 Slate Waste

2.6.1 Given the potential for there to be UXO within the Q6 slate waste, it is proposed that some form of screening of the removed slate will be required.

2.6.2 Effective measures for screening the slate for UXO are essential in order to maintain the safety of all site workers and to ensure that UXO is not inadvertently transported to Q1. This will be outlined in the Materials Management Plan but the scrap metal collected will be disposed of specifically through this OMS.

2.6.3 Effective screening will ensure that any UXO present can be dealt with in a controlled and safe way with the minimum of disruption.

2.6.4 To allow effective screening of slate waste, the following techniques may be employed:-

- Primary magnet (on plant feed conveyor) with safe access;
- Metal detector with safe access interlocked to stop the feed conveyor; and
- Secure inert munitions container.
- Any live UXO found during the screening of the slate waste will be disposed of in the EOD facility already on site.

3 Key Staff & Competencies

3.1.1 The following organogram identifies typical key roles and staff using Zetica as an example.

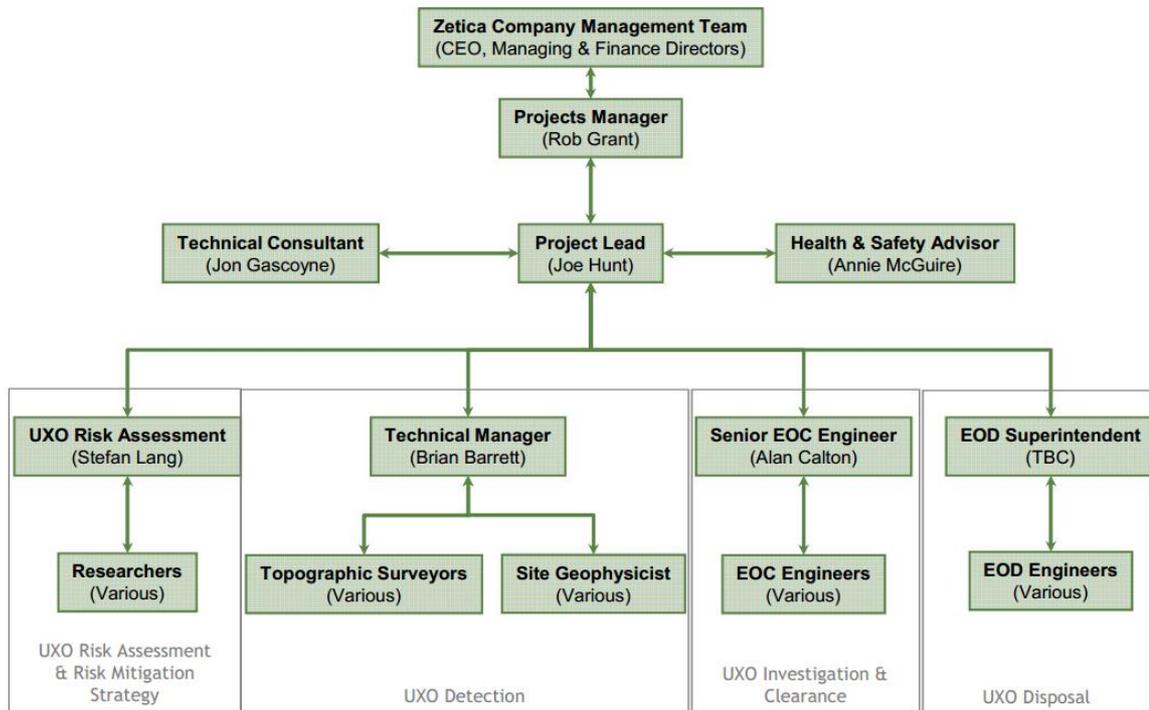


Figure 3: Draft project organogram

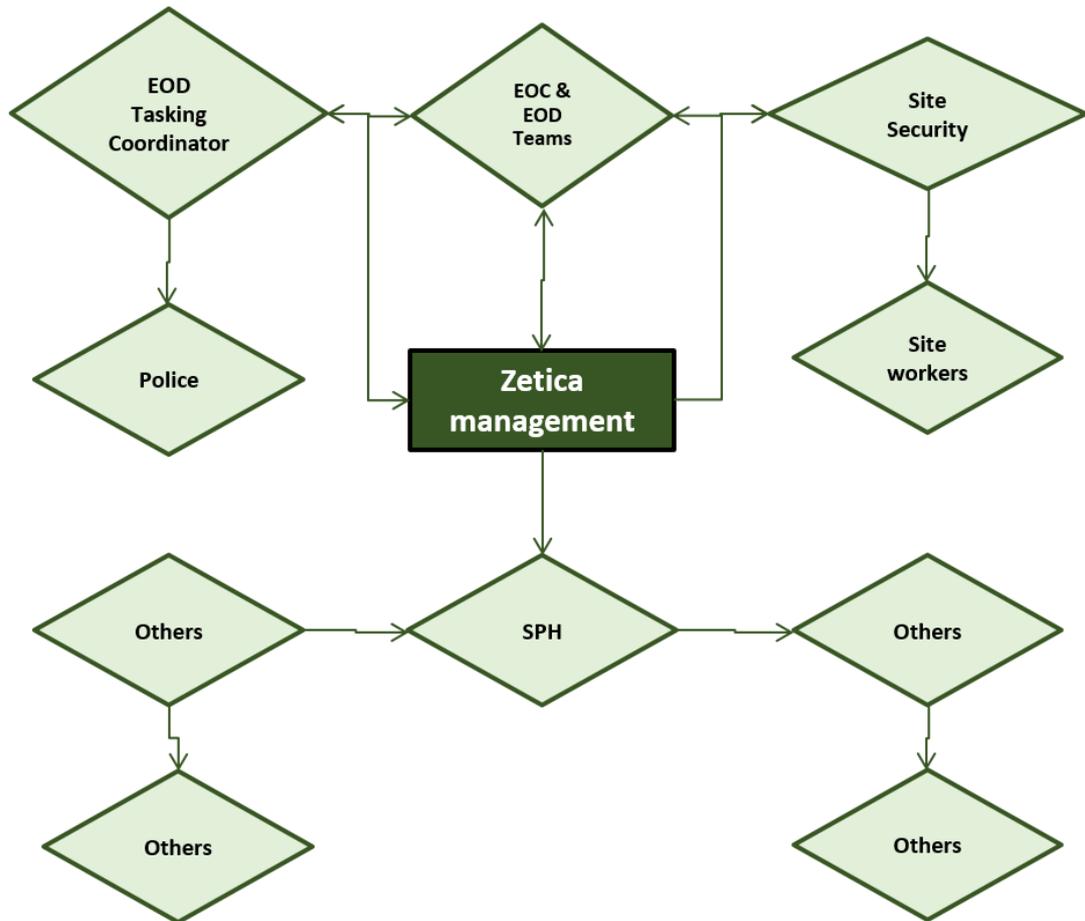
3.1.2 Key competencies of each staff member would be established and verified prior to starting any operation.

3.2 Liaison with Local Community/Authorities

3.2.1 Whilst this approach will mean that EOD operations offer no significant impact on the local community, routine liaison with the community and/or with the local authority is expected.

3.2.2 Such liaison will provide information on the intended work and offer an opportunity to ask questions in order to allay any concerns.

3.2.3 Routine liaison with the Police and MoD will also be undertaken by the Ordnance Management Contractor, in coordination with the Environmental Liaison Officer (ELO), as outlined in the CoCP.



EODTC or EOD teams will not contact non-essential personnel for the purposes of keeping them informed. Such parties will be made aware through Zetica/SPH management when appropriate.

Figure 4: Typical EOD Communications Flowchart

3.3 Community Impact

3.3.1 Given the location of the development it is not considered that there will be any significant impact on the local community from any EOD operation.

3.3.2 In spite of this, it is important to consider some of the potential affects the operations may have on the wider area so that they can be effectively communicated to local residents by the Environmental Liaison Officer (ELO).

This role is outlined in more detail in the Code of Construction Practice (CoCP).

3.3.3 The following provides detail of what the local community may experience:-

- Disposal operations may involve a ‘deep-thud’. It can provoke some people to inform the Police, but the Police will already be aware and will take no further action.
- Temporary closure (by sentries) of any public footpaths, permissive routes and local roads (Ffordd Clegir) that run in close proximity to the quarry (which is already off-limits to the public).

3.4 Ordnance Scrap

3.4.1 It is anticipated that a considerable amount of ordnance scrap will be removed from Q6 during construction works. Whilst inert, this has to be dealt with in a sensitive manner.

3.4.2 A contract with a local smelting company or alike would be arranged to dispose of ordnance scrap.

3.4.3 A Free from Explosives (FFE) certificate will be issued for all such material to provide comfort to the receiver, and the chain of custody recorded to ensure that the arrangement is not breached.

Target chain of custody record

Item details		Safe to move?		Other	
Target ID	Description	EOD Superintendent	Comments	Disposal route	Other remarks
T01		Signature			
T02		Signature			
T03		Signature			
T05		Signature			
T06		Signature			
T07		Signature			
T08		Signature			
T09		Signature			
T10		Signature			
T12		Signature			
T13		Signature			

Figure 5: Example target chain of custody record