# Emergency Action Plan Considerations for Remote Inland Sites

**Introduction:**

The closure of NDAC has removed a well-managed inland site with excellent Emergency Action Plan (EAP ) support from UK technical diver training. Inland alternatives offering suitable depth are also often in remote locations. These locations can have additional challenges for evacuating casualties. Good examples of these sites are Dorothea and Wast water, but Scottish sealochs and Cambrian mines can also provide similar challenging scenarios for casualty management.

This document aims to assist diving instructors with planning dives at these locations. Various points are illustrated with reference to Dorothea.

Professional instructors conducting technical and extended range training are required to comply with DOW 1997 recreational ACOP. This specifically requires the dive supervisor (instructor) for each diving operation to have a risk assessed Emergency Action Plan (EAP).

This EAP needs to be more detailed, better resources and better rehearsed than a standard EAP for managed quarry instruction. Technical diving exposes divers to a greater risk of DCS and barotrauma, with evacuation from the water complicated by additional gear. Remote inland sites does not offer rescue boats, which means the lift, tow and water egress must be managed by the dive team.

Inland sites can also several unique considerations which complicate both planning and resilience of that plan to certain dynamic factors. The most significant dynamic factor is weather.

This APSTO advice document offers a summary of factors and considerations relating to forming an effective EAP. Emphasis is placed on those which cause particular issues for smooth rescue. The EAP for any dive operation remains the responsibility of the individual instructor or dive school. This advice document does not replace the individual plans made by diving professional instructors, but content can be adapted to suit individual circumstances.

It is worth noting that same considerations exist for any instruction where duty of care can be established from instructor to student.

Technical instruction also presents a higher chance of instructors requiring assistance. This would require backup personnel to implement the EAP in the event of instructor being incapacitated.

**Potential injuries**

- Incomplete / poor decompression - DCS
- Ascent barotrauma

- Immersion Pulmonary Oedema
- Hypoxia / Hyperoxia

The worst-case scenario for each of these is the evacuation and transfer to hospital / recompression chamber of an unconscious diver.

**In water EAP**

Diving instructors should already have an effective EAP, regularly reviewed which ensures that a student, assisting safety diver or themselves can be lifted to the surface and dekitted. This is familiar from instructional diving operations both in quarries and on boats.

There is a greater need to in water support to transfer a diver from point of reaching surface to shore support due to lack of boat cover. This shore support may also need to be enhanced with additional personnel. The correct method to identify if these personnel are needed is via a manual handling risk assessment – how will the diver weighing 70-120kg be removed from the water?

**Land based EAP**

Once the casualty is ashore, the following steps need to be implemented.

1) Confirm emergency services contact and attendance scheduled.
2) Access to casualty for ambulance / helicopter paramedics and transfer of casualty to vehicle.
3) Weather and helicopter attendance.
4) Transfer to nearest available recompression facility.

**1) Emergency services contact.**

www.signalchecker.co.uk is an excellent resource fo assessing the value of normal mobile phone viability for emergency services contact. For example, it indicates that mobile signal is variable for Dorothea lying on the boundary between indoor and outdoor signal availability, with some network and phone options offering only patchy voice signal and no 3G or 4G capability. Dorothea shore support will be at waters edge, which means this signal is further shielded by the quarry walls.

An EAP needs to ensure that signal is available without preventing shore support staff from attending the casualty evacuation. This is not possible if phone / network / signal / topography prevent communication with emergency services.

The effect of weather on mobile signal quality is unknown.

The dive supervisor should confirm that this contact is possible BEFORE diving commences and preferably well in advance as part of planning the trip.

**2) Access to casualty for ambulance / paramedics**

Significant distance between shore and nearest ambulance access will affect rescue. Casualty transport through this area needs to be considered as the responsibility of the diving operation.

Dorothea example: A public footpath right of way exists through the Dorothea site, which has been confirmed accessible for ambulance support. Previous rescues have also been conducted with winching straight into helicopter. Current procedures emphasise patient stabilisation before transport, which means ground based paramedic attendance.

For an unconscious casualty at waterside, removal to the ambulance is the major EMS action. The slope from ambulance parking to waterside is severe. It is possible by 4x4, with little margin for safety at the bottom if control is lost or casualty treatment area is extensive. The concrete apron is now in excess of 20 years old and may also be undermined. The EAP needs to have a clear plan for moving the casualty from waterside to ambulance as a worst case scenario. This is a very significant manual handling challenge, while maintaining possible CPR or O2 admin.

This could require significant additional human power. The single (or not at all) shore support option will be utterly inadequate. Whether it is fair to require students to also act as safety and evacuation personnel is also a difficult choice for instructors.

### 3) Weather and helicopter attendance.

Mountain weather (North Wales, Lake District or Scotland) does not always suit helicopter operations. Maps are available showing the coverage of rescue helicopters in the UK.

Dorothea example: Although there is a rescue helo based at Caernarfon, this helo is also one of only two which cover the West coast of Ireland.

Dorothea is technically within range of other helicopters, but either requires high ground overflight for them to attend, or is at extreme range. Weather in the mountains could make these flights non-viable. Conflicting responsibility for other areas could also reduce availability.

The assessment of weather may affect the viability of rescue and therefore whether diving operations should proceed on a particular day.

### 4) Transfer to nearest available recompression facility.

The Murrayfield chamber on the Wirral is the most likely destination for diving casualties from Dorothea and provides a good example for travel time in the event of no helicopter being available.

The Caernarfon based helo is also the primary response for North Wales mountain and sea rescue. The mountains are currently experiencing extremely busy years with multiple callouts. Although helicopters are the ideal method of evacuation from Dorothea and have a proven capability to operate, their potential non availability should be planned for in the EAP.

Land transfer by ambulance is a drive of 85 miles, time 1 hr 47 in clear traffic. The route has to be via A483 to Caernarfon, then the A55 coast road. Shorter routes all have elevation problems, which makes them unsuitable for DCS.

O2 supply is the critical consideration after time for the road option. A journey of 2 hours plus will require 1,800 litres of O2 per casualty - one Ali80 per casualty. That is not carried aboard an

ambulance, which means if instructors wish to ensure their casualty has optimum treatment maintained, the O2 needs to be supplied by the dive team and supplied via constant flow mask.

As a backup, there is also the RESCUEAN option. This is a flow reduced that connects to an LP BCD feed and Non Rebreather Mask hose. That enables rich deco mix to be used for DCS treatment via a deco reg. Or CCR O2 etc.

**Summary.**

Deep, non managed inland sites offer great potential and depth for technical training, but often have extra emergency action considerations to be addressed. Failure to plan for these could result in serious consequences for casualties and severe consequences for dive operators via claims from families or failing to implement the DOW Rec ACOP properly.

Identifying when an adequate EAP cannot be achieved is central deciding what days are diveable. Adding phone signal, weather for helos and O2 provision into a plan are essential. The strength to call a day as a 'no dive day' because these dynamic elements are not suitable is also important, especially if team members have travelled and are already on site.