






# CROWNHILL TOPSOIL WASTE MANAGEMENT FACILITY SITE CONDITION REPORT

Unit 1009, Caerwent Army Training Estate, Caerwent

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## Site Details

Name of the applicant	Crownhill Topsoil
Activity address	Unit 1009 Caerwent Army Training Estate
National Grid Reference	ST 46457 92070
Document reference and dates for Site Condition Report at permit application and surrender	Site Condition Report CH013 – 08/08/16

Crownhill Topsoil's Waste Management Facility of proposed to be located at Unit 1009 of the Caerwent Army Training Estate. This is a facility operated by the Ministry of Defence and managed by Landmarc. It is predominantly used for the training of MOD personnel and the storage of MOD assets. Sections of the site are now let to companies for use as commercial / industrial facilities.

## Site History:

The site was constructed in 1939 as a Royal Navy propellants factory. This operated until 1995.

This facility included a Sulphuric Acid Factory and a nitrocellulose plant although we have not been able to pinpoint the location of these within the overall base. The sulphuric acid factory is described as Unit 1 and hence we assume that this would have been on the opposite side of the base to Unit 1009, with the base being expanded as

“RAF Caerwent was transferred to US administration after Charles de Gaulle expelled the US military from France in 1967. Caerwent thus became part of the US Army European 'theatre reserve stocks' under the command of the United States Army's "47th Area Support Group Reserve Storage Activity", and became known as USADA Caerwent (United States Arms Depot Activity - Caerwent) with a Royal Air Force Liaison Party also present.

The US Army spent over £4 million constructing 300 magazines and converting some of the former RNPF structures to conform to the required specification. The material stored included small arms ammunition, artillery shells (up to 8"), anti-tank mines, grenades, flares, and the multiple launch rocket system.

The first shipments of shells, rockets, mines, flares and small arms ammo arrived early in 1968 with shipments arriving in lorry convoys as well as rail. The majority of lorry convoys took place at night not to cause local road disruption, along with the freight trains, as they had to fit with BR timetables. In the early 1960s Severn Tunnel locomotive depot was not far away and steam locomotive no. 2231 was allocated as a permanent locomotive for shunting etc. at Caerwent (Dinham). This locomotive had a special spark arrestor fitted in the smoke box at Swindon to avoid sparks being blown and causing a fire hazard. The driver and fireman were forbidden to smoke at any time whilst inside the perimeter gate. Maintenance facilities were added in 1971.

In the early 1970s the site's capacity was expanded substantially, which allowed the closure of three other munitions bases in the West Midlands (Bramshall, Ditton Priors and RAF Fauld) in 1973. One of the reasons Caerwent was retained was its proximity to Barry Docks where many of the armaments entered the United Kingdom.

At this time there was also an increase of US army staff, with many of them stationed at Caerwent for a short period of time after serving in Germany and prior to returning home stateside. There were also parties, film shows in the on-site cinema and barbecues were held for the families of local people to show them appreciation for working with the US army.

At its height Caerwent was among the larger ammunition supply depots in Western Europe, storing over 80,000 tonnes of conventional munitions, a substantial fraction of the US Army's European stocks. In 1990 Caerwent shipped 12,000 tons of ammunition to the Middle East and played a critical part in Operation Desert Shield and Desert Storm.

Following the change in the political climate in Europe and subsequent scaling down of operations, the US Army announced it was to close down their storage operations at the establishment in June 1992. Over 60,000 tonnes of munitions were moved out over a period of less than ten months. The last batch was removed by train on 19 July 1993. The formal closure ceremony took place on 20 August 1993” – Source Wikipedia 2016.

More recently, following the introduction of the Landfill Directive, local authorities were under pressure to reduce the volumes of domestic waste sent to landfill. To achieve this, steps were taken to segregate ‘green’ waste from general household waste. Properties were issued with green waste bins to accommodate garden waste and uncooked food waste which did not contain animal by products. However due to the risk of contamination with animal by products it was felt that all green waste should be treated as if it were contaminated with animal by products and disposed of accordingly. A company called Worm Tech who specialised in vermiculture (the use of worms to degrade materials and form compost) proposed an in building composting facility where they would be able to achieve the temperatures required to destroy the bacteria within the green waste and produce compost. At the time the PAS100 standard for compost, was in development.

Biodegradable waste was bought to the site and was placed into windrows within the buildings at Unit 1009 to compost. Some of this waste contained animal by-products and it was hoped that the materials would reach a sufficient temperature within the buildings to destroy damaging bacteria within the compost.

As compost matured it was removed from the buildings and placed in stockpiles around the site. The facility failed to gain PAS100 and stockpiles of maturing compost built up around the site.

The volumes of biodegradable waste increased and the facility became unable to accommodate all of the materials. The amount of animal by-products also increased when local authorities started collecting kitchen and food waste.

Pests and vermin became an issue as stockpiles of biodegradable waste and un-matured compost grew. Eventually WormTech declared bankruptcy and the legacy materials at the site had to be cleared by a combination of Welsh Government, Local Authorities and NRW.

## Condition of the Land at Permit issue

### Geology / Hydrogeology

From the British Geological Society Hydrogeological Map of South Wales, the site is underlain by Carboniferous Limestone overlain by glacial till. The site is not underlain by a Principal Aquifer and is not within a Source Protection Zone.

### Surface Water

A small ditch flows through the centre of the site flowing north to south. This collects water from the woodland above the site and takes it into the site drainage. This only flows during heavy rainfall conditions.

A dam has been built across the ditch immediately upstream of the site but there is anecdotal evidence that this still flows during extended periods of wet weather.

The existing yard which Crownhill will utilise currently drains into this ditch via surface water gullies flowing directly into the ditch. Within the eastern part of the site, the gullies have become blocked and runoff flows along the southern edge of the site along the kerb line, down the access road and into the ditch. It is not known, how long this has been the case, it could have been during the WormTech operations at the site, or potentially earlier.

It is proposed that surface runoff from the site will discharge into this ditch but with the addition of attenuation ponds to remove suspended solids and hydrocarbon separators to remove any residual hydrocarbons which may be present in site runoff.

## Historical Contamination:

### Royal Navy Munitions Factory:

Prior to the construction of the Royal Navy Munitions Factory in 1939 The site area of Unit 1009 lay within agricultural land outside the village of Dinham.

Following the construction of the Royal Navy Munitions factory, the site was used for the production and storage of munitions. This included the production of sulphuric acid and nitrocellulose. The locations in which materials were produced and stored are not known. Due to the location of Unit 1009 on the perimeter of the base, it is likely that these units were constructed during the later stages of use of the base. Also due to the nature of the buildings within the unit i.e. large open buildings with high ceilings and large doors, it is unlikely that these were used for the storage of munitions (these would have been stored in shielded bunkers) or other reactive / flammable materials. It is more likely that this area of the base was used for the storage of vehicles or equipment.

## **United States Army Base:**

The base was subsequently taken over by the US Army and used for the storage of equipment and munitions.

The date of construction of the buildings and the nature of their use cannot be determined as up until the closure of the base in 1995, the area appears as a blank on ordnance survey maps.

## **WormTech Composting:**

Prior to Crownhill taking occupation of the site, all biodegradable materials have been removed buildings and yards but there are significant volumes of matured compost stockpiled around the perimeter of the site. It is difficult to estimate the volume of compost remaining as sections of it have become overgrown with a combination of brambles, nettles and other ruderal vegetation.

Crownhill intend to incorporate this compost within the topsoil and also to gain PAS100 accreditation to be able to sell compost directly to the market. During site walkovers compost stockpiles have been inspected and no leachate discharges have been noted. This indicates that the compost is matured and stable. Due to the size of the stockpiles, there is potential that materials within the core of the stockpiles could start to decompose anaerobically resulting in the release of leachate and raising the potential for ignition through microbial action.

To minimise this risk, Crownhill as part of their site management plan will turn compost stockpiles and as space on site allows lay them out to dry and to prevent anaerobic decomposition.

There is the inclusion of plastics within the compost and Crownhill have experimented with screening the compost to remove this. This has been semi-successful with the majority of the plastic removed but some plastic still remains. Crownhill will undertake further trials using smaller screens to attempt to remove this material.

During WormTech's operation of the site it is believed that all operations involving the handling of biodegradable waste, were undertaken either within buildings or on hard covered areas. It is believed that significant volumes of leachate were released which would have flowed into surrounding watercourses (these take the form of wide dry ditches which only flow during extreme rainfall events).

We have not tested soils for legacy contamination from the discharge of composting leachates as, these liquids would have contained only organic elements which would have degraded within the soil.



## Ground Investigation

Having reviewed previous activities at the site, we have been unable to identify any activities which may have given rise to potential sources of pollution which could have resulted in legacy contamination at the site.

There is little information on the specific use of the site during its period of use by the MoD or the American Army. More recently the activities of WormTech may give rise to sources of contamination but as the waste streams handled were organic it is unlikely that these will have persisted within soils at the site.

A visual assessment of the site and surrounds has been undertaken with no visual or olfactory evidence of contamination noted.