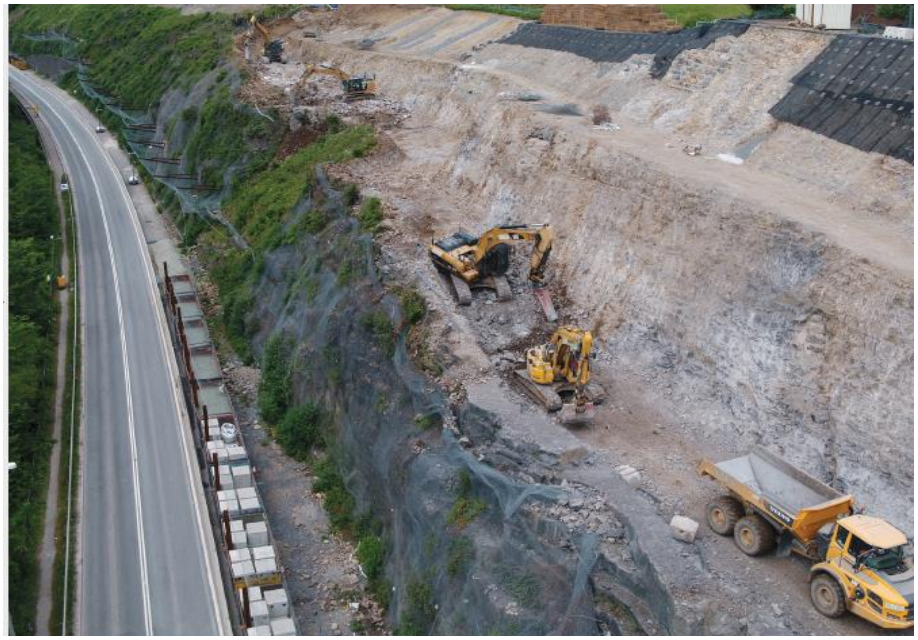

A465 Heads of the Valley Environmental Best Practice; Air Quality

Air Quality

by Hywel Woolf

The Challenge

The A465 is recognised in the Welsh Government's National Transport Plan as a strategically important route and also forms part of the Trans European Transport Network, linking to the midlands to the East and Swansea to the West. The A465 dualling scheme stretches for 8.1km from Brynmawr in the West to Gilwern in the East. The existing single three lane carriageway was constructed in the 1960s with generally two lanes in the uphill direction through the steep sided Clydach Gorge. The aim of the scheme is to upgrade the existing three lane carriageway to a dual carriageway to improve the safety of a notoriously dangerous road and to help stimulate the local economy of Blaenau Gwent and the Heads of the Valleys. The vast majority of the scheme is online (5.8km) with just 2.3km off-line. The extremely constrained nature of the gorge is much narrower than would normally be expected for a road of this type, making it an exceptionally challenging build. The site runs along the edge of the South Wales Coalfield syncline and through the Brecon Beacons National Park. It passes through the Usk Bat Sites Special Area of Conservation (SAC - the highest order of protected ecological site under European legislation) and Mynydd Llangatwg SSSI, renowned for an extensive karst limestone cave system, part of which passes directly under the road, allowing each passing car overhead to be easily heard!

As part of the works, over 1.3 million cubic metres of material is to be excavated and reused across the scheme for structural and general engineering materials. During the excavation, transportation and reprocessing (crushing, screening and grading) of material, the risk of emissions to air was identified as a risk to local residents at an early stage. As space is hugely constrained, the project has no option but to locate reprocessing areas in close proximity to local receptors. As a result, significant mitigation and control measures have been implemented and developed to minimise the scheme's impact.

Dust control

The scheme has developed a number of control measures to limit the impact of nuisance dusts. These include;

- **Water Suppression**: the use of traditional water suppression methods to limit dust lift off are deployed throughout the summer months across haul roads and directed to specific activities such as hydraulic breaking of rock;

- **Fog Cannons**: Fog cannons are deployed at the source of dust generating activities. This includes crushers and screens. Fog cannons atomise water droplets before throwing the droplets at sources of dust. The droplets then stick to the dust, causing the dust particles to fall out of suspension under gravity. Additives can be added for finer dusts to improve efficiencies;

- **Onsite Mitigation**: Planning the location to limit cross winds and dust lift off ensures that cross winds are reduced as much as possible through installing large bunds around the processing area. This also served to reduce visual impact of the processing area;

- **Haul Road Binding Agents**: Applied to unmade, compact haul roads to reduce uplift when vehicles use the roads;

- **Control Procedures**: the development of specific control plans briefed to teams operating reprocessing units in higher risk areas to limit the potential impact on local receptors. This has included the use of directional wind socks across the scheme for operators to self-monitor before suspending works if required;

- **Air Quality Monitoring**: onsite monitoring locations have been established across the scheme in partnership with local authority Environmental Health Officers to accurately monitor the amount and likely direction of dust potentially arising from the scheme. This has included strategically placing monitors in local properties to act as an accurate baseline;

- **Sustainable Water Sourcing**: Through abstracting low levels of water (levels where an Environmental Permit is not required) from a local river and storing onsite for use during dry periods to off-set the volume of potable water used within dust suppression.

- **Innovative Technology:** Vapour Abrasive Blasting reduces air born particulate by over 90% by optimising air, water and media ratio to produce a fine mist blasting media.

Low emission plant machinery

Clear links have been established between air quality and poor health, particularly related to exhaust fumes from diesel engines. In London a 'low emission zone' for Non-Road Mobile Machinery (NRMM) has been in place since 1st September 2015 and this is expected to be replicated in other UK cities.

Costain wants to lead the way in air pollution reduction and therefore, working with our nominated supply chain, we are introducing new requirements for directly hired plant.

From January 1st 2018 we require our suppliers of directly hired plant to provide plant with Stage IIIB of EU Directive 97/68/EC engines or newer (IV) which have considerably lower pollutant emissions than older engines.

Under the current London requirements, NRMM in Greater London is required to meet stage IIIA of the Directive as a minimum and NRMM in the Central Activity Zone or Canary Wharf must meet stage IIIB as a minimum. In 2020, this will increase to stage IIIB for Greater London and stage IV for CAZ/CW.

These NRMM requirements are applicable to ALL Costain Contracts, country-wide including Joint Ventures where NRMM is directly hired or procured. The Costain plant hire standard clauses have been updated accordingly and work is underway to work in partnership with our supply chain.

Logistics Management

At the A465, the scheme has optimised deliveries across the project, reducing the time spent on site and miles travelled by delivery wagons. Completing on-site studies with the supply chain pinpointed recommendations to revise the way material is delivered to site, increasing the total load weight and revising the Traffic Management plan so all works access points are clear to the delivery driver.

The project has also removed over 63,000 vehicle movements from the public highway through strategically placing a temporary bridge across the A465 to aid earthwork operations. The bridge has allowed larger articulated dump trucks to transport material over a shorter distance, without any interaction with members of the public, reducing Carbon emissions whilst ensuring nuisance impact from the scheme is minimised.