

National Planning Policy Framework and surface water drainage

Reference: The Gas Station (TGS) Hereford Ltd, Old Mushroom Farm, Haywood Ind Est,
Callow, Herefordshire, HR2 8BY

1. Flood risk

Flood risk summary for the area around the above site:

Area	Classification
Rivers and the sea	Very low risk
Surface water	Very low risk

1.1 Rivers and the sea

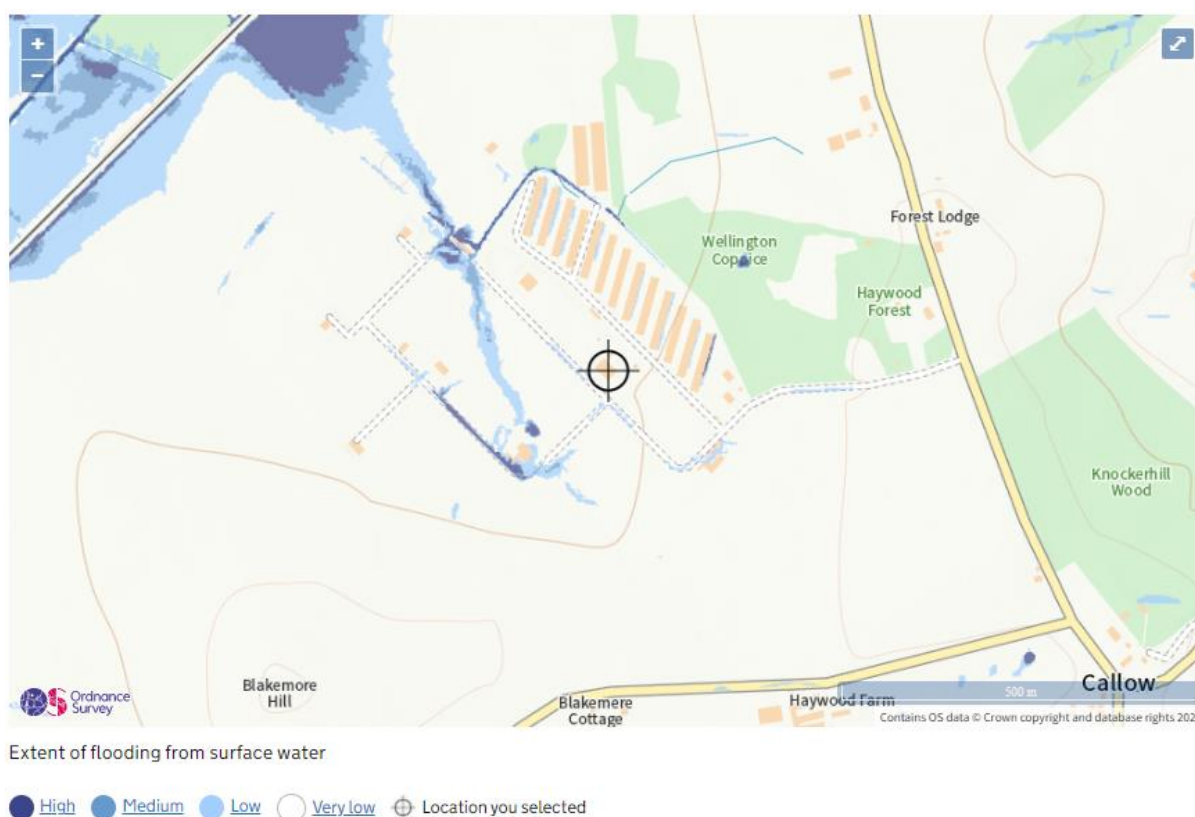
The Environment Agency is responsible for managing the flood risk from rivers and the sea. This flood risk summary is not property specific. Very low risk means that each year this area has a chance of flooding of less than **0.1%**. This service takes into account any flood defences.



Extent of flooding from rivers or the sea

● High ● Medium ● Low ● Very low ● Location you selected

1.2. Surface water



This flood risk summary reports the highest risk from surface water within a 20m radius of this property. Very low risk means that each year this area has a chance of flooding of less than 0.1%.

This information is suitable for identifying which parts of counties or towns are at risk, or have the most risk the approximate extent and depth of flooding. It's unlikely to be reliable for a local area and very unlikely to be reliable for identifying individual properties at risk.

Surface water flooding, sometimes known as flash flooding happens when heavy rain cannot drain away is difficult to predict as it depends on rainfall volume and location can happen up hills and away from rivers and other bodies of water is more widespread in areas with harder surfaces like concrete. Therefore no flood risk assessment is required.

2. Development structures

The majority of the development of the site made up of temporary structures (e.g. containers) and therefore any rain or surface water will filter into the surrounding ground and will absorb the water content where the temporary structures are located. Where there are access roads on site this will be limited to stone and gravel which will allow water to permeate through into the ground. There will be some tarmac near the weighbridge area.

Where there are permanent structures (e.g. concrete bases for the tanks) these are required under recognised good practice by UKLPG to ensure they remain stable and secured for the safe storage of bulk LPG in all above ground tanks.

Total site of coverage

Taking into account the above it has been calculated in table A how much in proportion and limited impact the development of surface water will have:

Table A: Area of site

Area of site	Sq meters	Percentage
Permanent structure coverage	182m ²	2.5%
Temporary structures	354 m ²	5.1%
Roadways	484 m ²	7%
Total coverage of structures	1020m²	14.9%

<i>Total area of site:</i>	<i>6832m²</i>	<i>100%</i>
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The percentage figures are conservative and in reality will be lower.

Therefore the total permanent structure coverage accounts for 2.5% that will potentially push surface away into other areas on site. 7% of the surface area is road surface. The majority of rain and surface will remain on site. Details are described in the next section.

3. Site drainage

3.1 On site storm drainage

For each concreted area French drains will be installed to collect water and drain surface water away and gradually release water back into the ground through perforations in the diverted pipework eventually leading the overflowed surface water into underground soak away at the front of the site. This will be emptied as and when required. The size of the soakaway is 2m x 7m x 2m depth holding approximately 28m³ of water using the natural gradient of the site.

French drains will be dug for discrete and effective drainage of surface water. The trench will be wide enough to accommodate the pipe with an aggregate surround and a layer of membrane. Perforated surface water drains pipe 200mm will be used at a depth of 60mm below the surface to accommodate the aggregate. Perforated side shall face down to ensure water exits the pipework.

The bottom of the trench will be filled with aggregate. The large aggregate will keep the water flowing quickly and with potentially fewer blockages, as any pieces of debris that manage to get into the system will flow through gaps in the aggregate. Aggregate that is 10mm to 20mm in size.

The top of the pipe in the trench shall be backfilled until the gravel level with the top of the trench.



3.2 Road surfaces

This surface material will be stone/granite type chipping ranging in size from 4mm to 20mm and not be concrete as fill material. This is ensure after water infiltrates though it and into the subgrade, it maintains the same level of alkalinity. The depth will be a minimum of 75mm.

A geotextile shall be installed between the sub-base and subgrade. The geotextile can be either a mono filament woven, non woven bonded or needle punched non-woven fabric. The geotextile shall be manufactured from a suitable polyethylene or polypropylene filament able to withstand naturally occurring chemical and microbial effects. The production of the geotextile shall be in accordance with BS EN ISO 9001: 2008. The tensile properties of the material shall be verified in accordance with BS EN ISO 10319: 1996.

Table B: Geotextile characteristics and specification

Characteristics	Standard	Woven Filter	Non Woven Filter
Weight	BS EN 965: 1995	$\geq 200 \text{ g/m}^2$	$\geq 300 \text{ g/m}^2$
Ultimate Tensile Strength	BS EN ISO 10319: 1996		
Longitudinal		$\geq 30 \text{ kN/m}$	$\geq 15 \text{ kN/m}$
Transverse		$\geq 30 \text{ kN/m}$	$\geq 15 \text{ kN/m}$
Strain at Nominal Tensile Strength	BS EN ISO 10319: 1996		
Longitudinal		$\leq 25\%$	$\leq 70\%$
Transverse		$\leq 25\%$	$\leq 70\%$
CBR Puncture	BS EN ISO 12236: 2006	$\geq 3 \text{ kN}$	$\geq 3 \text{ kN}$
Opening Size	BS EN ISO 12956: 1999	$\geq 0.2 \text{ mm}$	$\geq 0.1 \text{ mm}$
Water Permeability	BS EN ISO 11058: 1999	$\geq 20 \times 10^{-3} \text{ m/s}$	$\geq 40 \times 10^{-3} \text{ m/s}$

The next layer will be compacted sand or dry earth to help level the road surface where the ground cannot be effectively level. Then the final layer is the original ground.

Cross section of road surface

	Stone / granite surface (75mm)
	Geotextile subgrade (2mm)
	Compacted sand (50mm)
	Level ground