Sellafield Ltd

Two Storey Modular Building
Drainage Impact Assessment

1 Introduction

This Drainage Impact Assessment has been prepared by Sellafield Ltd (SL). It accompanies a planning application for the Two Storey Modular Building which will be used as a Site Emergency Assembly Point (SEAP) for the Calder Hall part of the Sellafield site. The provision of identified SEAP shelter arrangements is a necessary requirement of Nuclear Site Licence Condition 11- Emergency Arrangements.

One of the current Site Emergency Assembly Points (SEAP's) for Calder Hall is located within the Administration building, which is planned to be demolished to make way for future developments. The other existing SEAPs at Calder Hall are unable to accommodate the full capacity required and it has been confirmed by Sellafield Ltd's Emergency Planning Team that there are no existing facilities in the surrounding area that meet the needs of the additional SEAP requirement.

Failure to make an alternative SEAP provision would halt works on the Calder part of the Sellafield site and would significantly impact high hazard reduction delivery plans. Therefore, it has been identified that a new SEAP facility must be provided, with capacity for approximately 300 people, with associated welfare and office space.

This document provides an overview of the current flood risk to the proposed development site area within the associated planning application red line boundary, from all potential sources. This is followed by an assessment of the impact of the new development on the site and in the local surrounding area. The report makes recommendations for surface and foul water management to mitigate the impacts of the scheme.

2 Proposed Development

2.1 Background

This planning application seeks Planning Permission for the erection of a 2 storey modular building to the east of the Calder Hall part of the Sellafield site. Following an extensive selection process that considered the proximity of the Calder site and ruling out options that present a radiological risk to personnel, a location to the east of the Calder site was chosen. The site is a greenfield site and an existing car park, and has not been developed with buildings in the past but has had some construction works during its lifetime (e.g. the laying of underground cables).

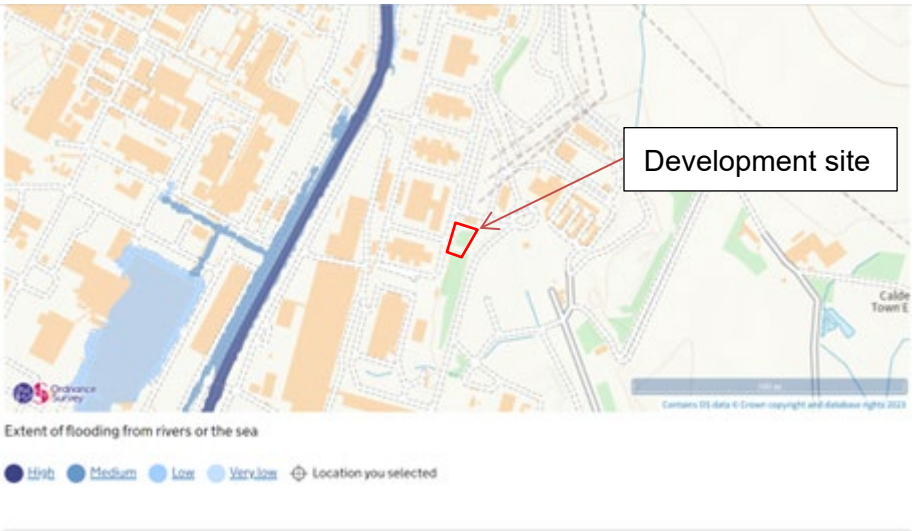
2.2 Development Site

The proposed development site measures approximately 1300m². It is contained entirely within the Sellafield Nuclear Site Licensed boundary and will be constructed upon the eastern part of the Calder Hall Power Station site. The building will be connected to existing services, including the foul and surface water networks.

Site Specific Flood Risk

2.3 Flood Risk from Main River

The proposed development site is located approximately 300m from the nearest main river, the river Calder, which runs through the Sellafield Nuclear Licensed Site. The current Environment Agency (EA) Flood Map confirms that the entire development site is situated within Flood Zone 1 which has an extremely low probability of flooding.



2.4 Groundwater Flooding

The Calder SEAP development will not be affected by ground water flooding, as the building is to be built 1 metre above the existing ground level on columns.
The detailed design of the surface water management strategy for the Calder SEAP development will effectively ensure the proposed development will not contribute to groundwater flooding or have an adverse impact on the groundwater environment.

2.5 Surface Water Flooding

Sellafield Ltd maintains a computerized network model to provide surface water flooding data for the whole site including the entire Calder Hall site. This network model does identify the storm return periods that cause the networks to be compromised causing localized surface water flooding. As surface water flooding is already prevalent on the Calder site (partly due to climate change parameters), the development therefore has a requirement to ensure there is no detriment to the existing surface water network as opposed to solving the network shortfalls.

To satisfy this, we undertook modelling of the existing surface water network to understand the extent of the existing flooding across the site and then we added the new development to the model to see what the impact would be. This would enable us to work out what volume of attenuation would be required.

3 Drainage Impact Assessment

3.1 Existing Drainage Arrangements

The Calder Hall site has a separate sewerage system, which deals with foul and surface water individually.
The foul water system is not affected by this development as the SEAP facility is a direct replacement to the administration building that is due for demolition, so there is no net gain on the number of personnel across the site and hence no increase in flows.
The existing surface water network collects drainage from the building roofs, hard standings and roads and conveys it to a discharge point at the river Calder.

3.2 Proposed Drainage Arrangements

Surface water collected from the proposed development will be discharged to the existing site drainage network. The proposed drainage collection system is designed to manage rainfall associated with a 100-year storm with 50% climate change allowance.
After running the Sellafield network model for a variety of storm return periods up to a return period of 30 years, the resultant attenuation requirement was calculated to be $1.3m^3$. This attenuation volume is to be incorporated into the new SEAP building surface water collection system, prior to it connecting to the existing surface water network.

The conclusion being that there will be no increase to a flood risk at the proposed site or in the wider Sellafield site

3.3 Proposed Surface Water Management Strategy

To achieve the above ground drainage requirements, the following surface water management strategy is proposed:
Collection features shall intercept run-off and convey it into the main surface water drainage network:

- The roof drainage will be collected and directed to the “Rainwater Harvesting” tank to ensure it is topped up before overflowing to the surface water network.
- The access and hard standing areas to the side and rear of the building will be collected into an ACO drain before being connected to the surface water network.
- The car park and access areas to the front will connect to the existing road drainage. Note: this area is currently a car park and is connected to the existing road drainage so there is no change.
- The attenuation requirement will be achieved by the number of manholes and inspection chambers associated with the development (circa 2.5m^3).

The main drainage network shall comprise pipes and manholes, located beneath the access hardstanding to the east and south of the SEAP building. These shall receive the run-off from the collection features and convey it towards the existing connection manhole to the north of the development site.

4 Summary/Conclusion

Based on the network analysis undertaken on the new building drainage infrastructure, The risk of additional flooding of the local area is extremely low. The new drainage network has enough attenuation to limit the impact of flows to the existing surface water system and whilst the existing network indicates that surface flooding may occur in return periods greater than 30 years, this is minor flooding of less than 100mm on the roads, with no buildings affected.