HighWater
Private Water Supplies

By Appointment to
Her Majesty the Queen
Supplier of Private Water Services
HighWater
Nairn

Our Ref: CathedralofStMoluag-Lismore GV/IM

5th February 2025

FAO: Sebastian Tombs
Baile Geamhraidh
Isle of Lismore
Argyll
PA34 5UL

Sent by email to: sebastiantombs99@yahoo.co.uk

Dear Sebastian,

REVISED Borehole Feasibility Report – Cathedral of St Moluag, Lismore

Further to our recent site visit on 28th January 2025, I am pleased to provide our borehole feasibility report and proposal for drilling and testing a borehole to provide a water supply at the above location. The proposal should be read in conjunction with our 'Introduction to Borehole Drilling' letter which provides more information on the process of borehole drilling and the associated installation requirements.

Borehole Feasibility Report

Anticipated Water Demand

A groundwater abstraction is proposed to provide drinking water for the following:

- Welfare facility consisting of 5 toilet & kitchen.

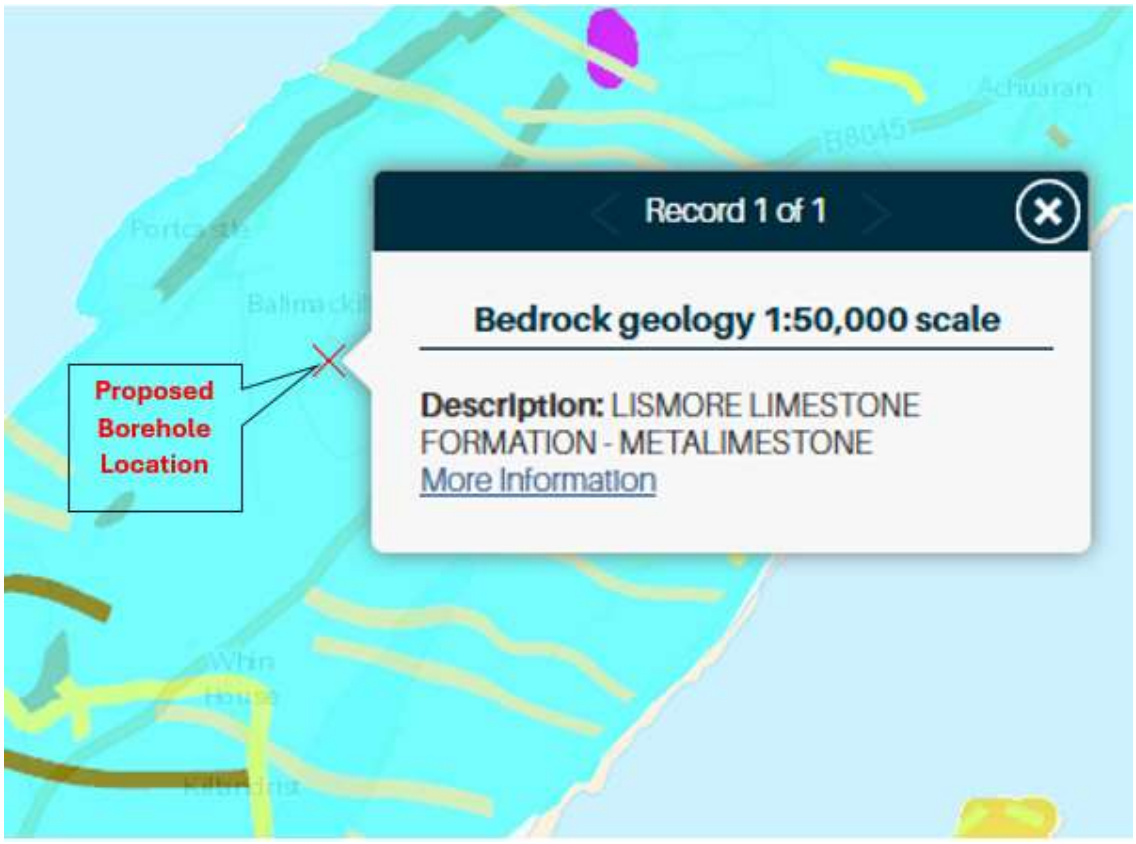
It is envisaged that the welfare facility would require a daily water demand of 800 to 1,500 litres per day. This figure is based off previous HighWater encounters with similar project requirements.

Geological and Hydrogeological Environment

The bedrock geology of the area is summarised on the map below, with data from the British Geological Survey's (BGS) online 1:50,000 data. The data indicate that the area is underlain by limestone rock of the Lismore Limestone Formation. This formation is also interspersed with dykes comprising microgabbro and basalt. The BGS data also show that no superficial deposits are expected to be present overlying bedrock at this location.

BGS online hydrogeological data classify the Lismore Limestone Formation as a 'low productivity' aquifer, with groundwater present in the near surface weathered zone and secondary fractures.

Bedrock Geological Map – area around the proposed site:



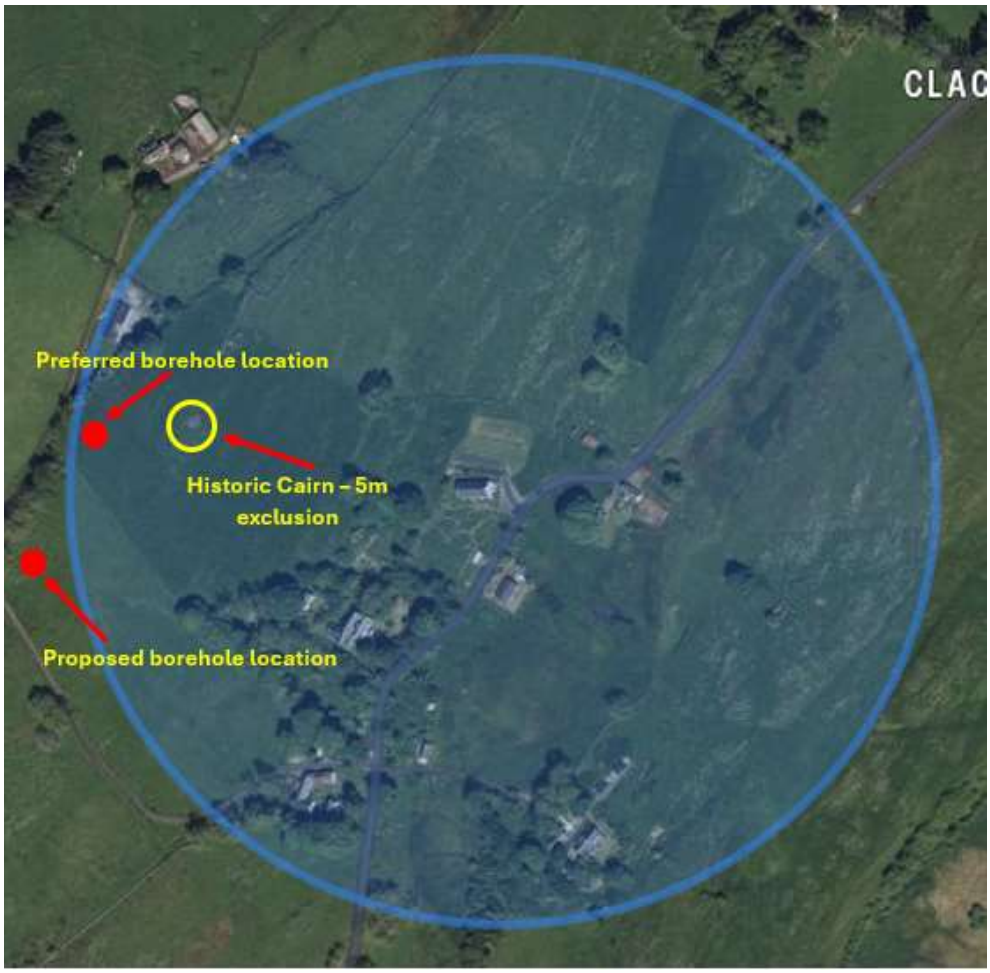
The underlying geology/hydrogeology is relatively uniform and as such does not influence the decision about where to locate the borehole.

The above proposed borehole location has been determined due to a 250m exclusion zone around the cemetery section of the cathedral grounds. It is SEPA recommended guidance that 250m separation be achieved between a borehole and a cemetery. The proposed borehole location is out with the 250m exclusion zone, however, is located within the boundaries of a different landowner.

Highlighted in the below imagery is a preferred borehole location. The preferred borehole location is approximately 245m to 250m away from the cemetery and has an elevation

difference of approximately 10m greater than the cemetery. Please see below annotated aerial image of proposed borehole location in relation to 250m exclusion zone.

This location is preferred due to its location within the boundaries of the cathedral, therefore any confliction with neighbouring boundaries will be avoided. In addition, this location lends itself to convenient pipework routes.



Nearby Boreholes

The BGS database also holds records of borehole water wells drilled in the same bedrock formation in Lismore. Sustainable yields of 600 to 800 litres / hour (14,400 to 19,200 litres per day) are recorded. The following information outlines the boreholes within the area and their construction / yield information:

- HighWater have drilled a borehole 6km from proposed borehole location – 40m depth (6m steel casing) – 720litres per hour (17,280litres per day).

Foreseeable Borehole Yields

In HighWater's experience yields in excess of 100 litres/hour (2,400 m^3/day) can be expected.

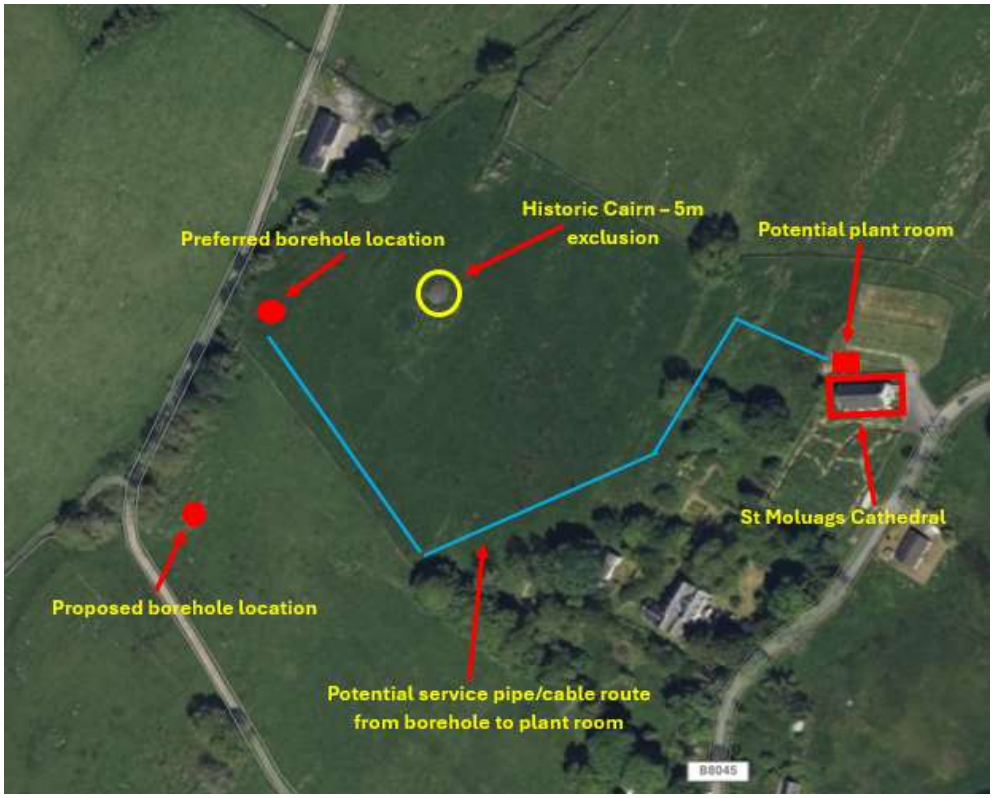
It should be noted that borehole yields from bedrock aquifers can be highly variable due to the large number of environmental, geological and hydrogeological variables that influence the targeted water source. For reference, approximately 90% of the boreholes drilled by HighWater into rock types of this nature provide sustainable yields of in excess of 1.5m^3/day.

Proposed Borehole Location

The location of a borehole should take into consideration a variety of factors including:

- Assessment of likely subsurface geological / hydrogeological conditions
- Sufficient separation (ideally 50m minimum) from any septic tank or other known or suspected cause of groundwater contamination
- Safe working distance from any buried / overhead services
- Accessibility for drilling equipment
- Proximity to the proposed point of use / source of power supply
- Effect of noise / dust during drilling activities
- Client preference

Taking the above into account, a potential borehole location has been identified and is shown on the plan below. Comments on the siting considerations are given below.



Operational Hazards and Access

Access

Access for the drilling equipment is good. The drilling rig can be transported to the Cathedral and offloaded, then tracked to proposed drilling location. The site is level, and ground was hard packed and stable. There are no trees overhanging the drill site.

The field that situated the proposed borehole location should be easily navigated when tracking the drilling rig, however a few rocky outcrops might cause a different route to be taken within the field.

Services

No buried services have been identified as potential issues. However, a full line search will be caried out prior to any borehole drilling works.

Environmental Considerations

Potential Contamination Sources

No potential sources of contamination (septic tanks, fuel storage, chemical store etc) were observed during the site visit.

It is worth noting that as part of the overall St Moluags restoration project, a septic arrangement will be installed. It is important that HighWater are aware of any new septic arrangements as part of the project works.

Neighbouring Properties, Roads, Water Courses

There are no neighbouring properties within the immediate vicinity of the proposed borehole drilling location.

The nearest property is located 75m north of the proposed borehole location.

Radon Data

Inspection of 'Public Health England (PHE) - British Geological Survey (BGS) Joint Indicative Atlas of Radon in Great Britain' data indicates that the site is in the lower category (Class 2) of 5 categories for radon potential. The area is given the following designation: "Some parts of this 1km grid square are in bands of elevated radon potential. Maximum radon potential is greater than 30%.".

Coal Authority Data

The proposed site is out with any Coal Authority sub-surface coal mining reporting areas. As such it is not necessary to consult the Coal Authority before undertaking the drilling works.

SSE Energy Hydro Assets

Inspection of SSE Energy hydro assets database has shown no water resource and energy infrastructure associated with SSE within 850m of the site.

Nature Scot Protected Area Designations

Inspection of the open source 'SNH Protected Sites WMS' dataset (which includes locations of SSSI, SAC and SPA authorisations) shows that there are no onshore protected area designations within 253m of the proposed sites.

Archaeology

There is an historic cairn located to the west of the cathedral and clearly visible on arial imagery (page 3 & 5) will require a minimum clearance of 5m in consultation with Historic Environment Scotland. Both proposed borehole locations and associated pipework routes are beyond the 5m boundary.

Abstraction Licensing – Scottish Environment Protection Agency (SEPA)

There are three different levels of abstraction licence that SEPA permit under the CAR Regs (formally known as The Water Environment (Controlled Activities (Scotland) Regulations) 2005 (CAR)), as follows:

1. General Binding Rules (GBRs) - <10m^3/day (GBR2)
2. Registration - >10m^3 and 50m^3/day
3. Licence:
    a. Simple - >50m^3 and <2000m^3
    b. Complex - >2000m^3

The water demand from this site will be well below the 10m^3/day threshold. Thus, the borehole abstraction would fall under the General Binding Rules, and no specific registration or licence would be required.

BGS Notification

There is a statutory requirement (Water Resources Act, 1991) for the drilling contractor to notify the British Geological Survey (BGS) if a water borehole of more than 15m depth is to be drilled; and to supply full information including drilling records to the BGS for inclusion in the National Well Record Archive.

I trust that this report is an accurate reflection of your requirements at this stage, however, please do not hesitate to contact me should you require any further information.

I look forward to hearing from you in due course.

Yours sincerely,

Greg Vears
Project Manager
For **HighWater**