SEPA EXTERNAL GUIDANCE FOR MITIGATION FLOW COMPLIANCE CHECKS

1. Purpose

a. To confirm that the mitigation flows required by CAR licence conditions are being delivered.

b. To confirm that the dimensions and design of the impoundment and mitigation structure are the same as set out in the application for CAR authorisation. This is important as it allows hydraulics calculations to be undertaken to determine whether the structure will meet the mitigation requirements in all flow conditions.

c. To ensure that there is no obstruction within the mitigation flow structure preventing or restricting the mitigation flow being delivered, for example sedimentation or debris.

d. To confirm that the location of the impoundment matches with the licensed location.

2. Timing of the inspection

a. The scheme should be generating at the time of the inspection.

b. The percentile flow range for generation can be established using the design minimum and maximum turbine flow and the intake FDC.

c. There should be no spill over the intake weir (this ensures that the flow downstream is solely delivered from the mitigation structure).

3. Flow Gauging

Depending on the expected mitigation flow range the following methods can be used:

a. Container and stopwatch (3 separate measurements should be taken and an average used)

b. FlowTracker (Acoustic Doppler)/ current meter. If a suitable section cannot be identified immediately downstream of the intake allowance must be made for any inter-catchment flow.

c. Salt dilution method.

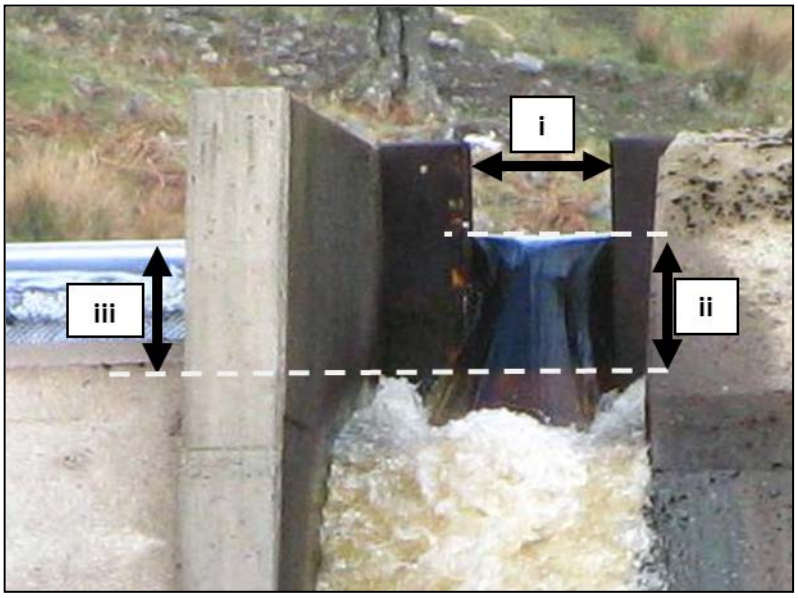
A gauging should be taken upstream of each intake to determine the natural flow conditions on the day, when compared to the agreed flow duration curve.

A gauging should also be taken immediately downstream of a mitigation structure so the measurement only captures the flow being provided from the structure.

4. Measurements required

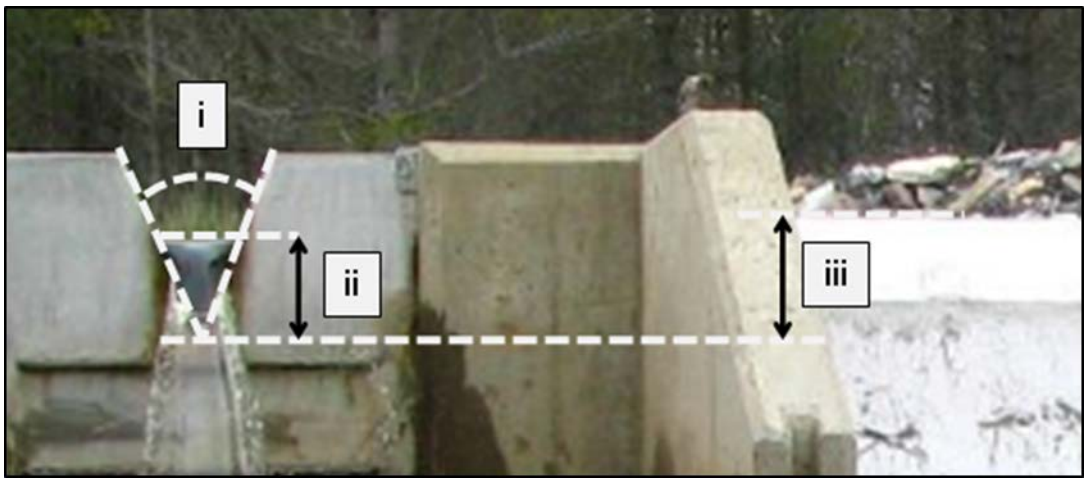
a. Mitigation structure (rectangular notch)

i. Notch width in metres
ii. Height of intake weir crest above notch crest
iii. Height of water level above base of notch
iv. The thickness of the notch plate and how (if at all) the edges are bevelled



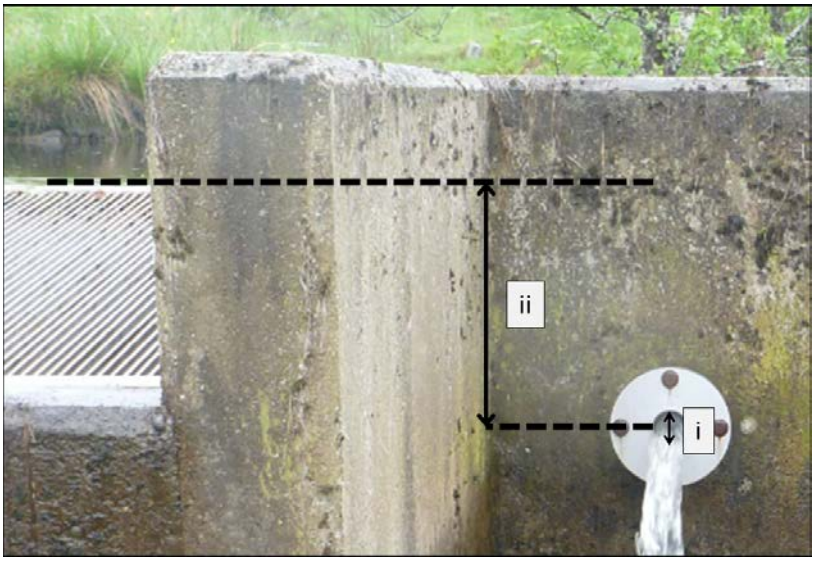
b. Mitigation structure (V-notch)

i. Angle of notch
ii. Height of water level above apex of notch
iii. Height of intake weir crest above notch base
iv. The thickness of the notch plate and how (if at all) the edges are bevelled

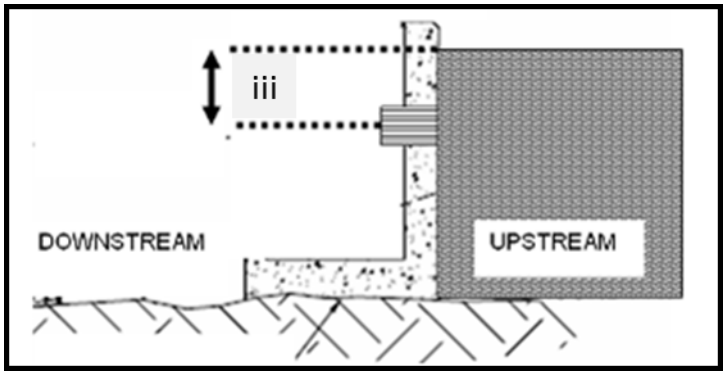


c. Mitigation structure (orifices)

i. Internal diameter of the orifice
ii. Height of intake weir crest above orifice centre point



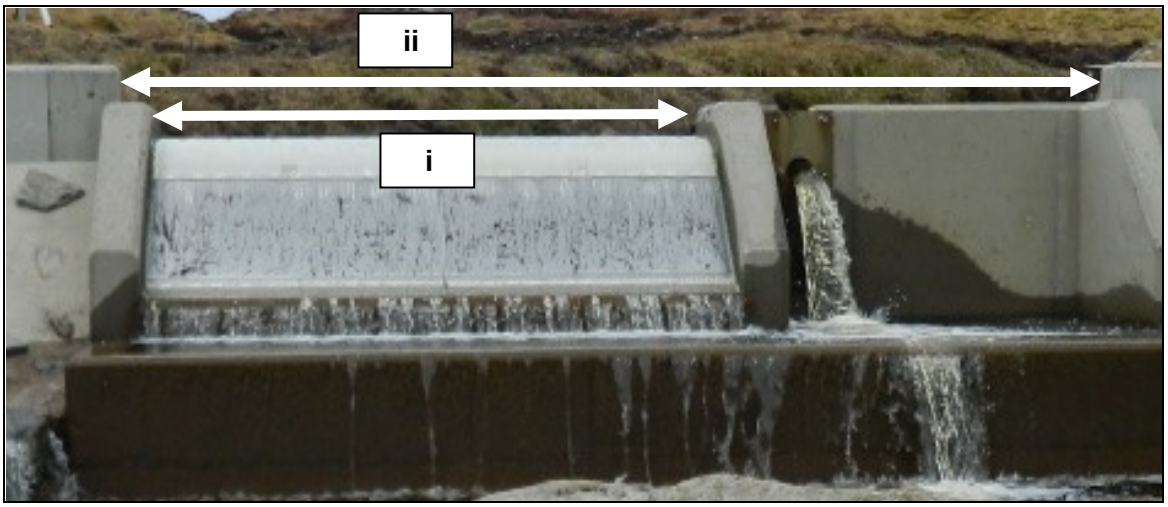
iii. Water level above centre of the orifice



Note: Where a pipe or orifice has been constructed in the wall of the intake chamber, as in the example below, a physical flow measurement will be the only option.

e. The intake weir

i. Width of intake weir
ii. Entire width of approach channel
iii. Breadth of the intake weir crest (direction of flow)



5. Further information to be recorded

a. Date and time of measurements.

b. Whether the intake weir is spilling.

c. Photographs of the impoundment and mitigation structure

d. Photographs of river channel upstream and downstream of the impoundment

e. Photograph(s) of the gauging section(s).

f. Note if there is any sediment build up behind the weir.

g. Photographs of tailrace and upstream and downstream of powerhouse.