

ORC NOTIFICATION RECOMMENDATION REPORT

ID Ref: A1789011
 File No: RM22.434
 Application No: RM22.464.01, RM22.434.02 and RM22.434.03
 Prepared for: Staff Consents Panel
 Prepared by: Josie Burrows, Consultant Planner on behalf of Otago Regional Council
 Date: 12/05/2023

Subject: Application RM22.434 by Cold Gold Clutha Limited to take and use surface water from the Clutha River / Mata-Au (non-consumptive), disturb the bed of the Clutha River / Mata-Au and discharge contaminants (sediment) to the surface water of the Clutha River / Mata-Au for the purpose of operating a suction dredge and to disturb the bed of the Clutha River / Mata-Au for the construction of two slipways

1. Purpose

To report and make recommendations under sections 95A-G of the Resource Management Act 1991 (the Act) on the notification decision for the above application. This report presents my view only and does not include the view of any submissions potentially received on the application.

2. Background Information

Applicant: Cold Gold Clutha Limited

Applicant's Agent: Darryl Sycamore, Terramark Limited

Site address or location:

- Dredging activity – Clutha River / Mata-Au between downstream of the Luggate Bridge (upstream) and the confluence with Lake Dunstan (downstream), with two exclusion areas being:
 - From 100 m upstream of the confluence of Luggate Creek with the Clutha River / Mata-Au and for a distance of 350 m downstream, terminating at the downstream extent of the island within Devils Nook; and
 - The delta portion of the Clutha River / Mata-Au from the confluence with Lake Dunstan to the confluence with the Lindis River.
- Slipway 1 – Clutha River / Mata-Au at Beaumont
- Slipway 2 – Clutha River / Mata-Au at Queensberry

Legal description(s) of the site:

- Dredging activity – Section 1 SO 24921, Section 1 SO 23940, Section 1 SO 23976
- Slipway 1 – Crown Land Block I Crookston Survey District
- Slipway 2 – Part Section 1 SO 24921

Record of title number and owner:

- Dredging activity – 1291 Crown Land, 47722 Crown Land, 91358 Crown Land

- Slipway 1 – No title number, Crown Land
- Slipway 2 – 3113724 Crown Land

Map reference(s):

- Dredging activity – Clutha River / Mata-Au between NZTM 2000: E1305697 N5040203 (upstream) and NZTM 2000: E1307834 N5018386 (downstream), with two exclusion areas:
 - between NZTM 2000: E1305436 N503955 and NZTM 2000: E1305651 N5039249 (Devils Nook)
 - Between NZTM 2000: E131105 N5024451 and NZTM 2000: E1307834 N5018386 (Delta upstream of Lake Dunstan)
- Slipway – NZTM 2000: E1329505 N4917655
- Slipway 2 – NZTM 2000: E1310061 N5035771

Consent(s) sought:

- Water permit to take and use surface water from the Clutha River / Mata-Au (non-consumptive)
- Land use consent to disturb the bed of the Clutha River / Mata-Au associated with suction dredging
- Discharge permit to discharge contaminants (sediment) to surface water of the Clutha River / Mata-Au associated with suction dredging
- Land use consent for the construction of a temporary slipway at Rongahere Road, Beaumont
- Land use consent for the construction of a permanent slipway at Queensberry

Purpose: For the operation of a suction dredge and construction of two slipways

Current consents: The applicant holds current consents for the suction dredging activity in a different location of the Clutha River / Mata-Au, between Roxburgh and Tuapeka Mouth (RM20.087.01, .02 and .03).

Section 124 timeframes: This is an application for a new activity and so section 124 does not apply.

2.1 Key issues/risks

The key issues/risks with the application are:

- Information gaps which means the level of effects could not be concluded; and
- Effects on ecological values and water quality; and
- Effects on cultural values (statutory acknowledgement location).

2.2 Summary

The applicant has requested public notification.

3. Description of Activity

The applicant, Cold Gold Clutha Limited (CGCL), currently operates a section dredge operation between Roxburgh Dam and Tuapeka Mouth on the Clutha River / Mata-Au (under resource consents RM20.087.01, .02 and .03) and is seeking consent to re-establish the activity further up the Clutha River / Mata-Au between immediately downstream of the Luggate Bridge and the confluence with Lake Dunstan (with two exclusion areas, detailed below). One of the exclusion areas is the lower approximately 8.2 kilometres (km) of the extent sought, which does add some confusion, and in reality, the extent of the proposed suction dredging sought is the Clutha River / Mata-Au between downstream of the Luggate Bridge and the confluence with the Lindis River.

The applicant holds Crown Minerals Mining Permits 60593 (granted in February 2021, expires in February 2031), 60515 (granted in June 2019, expires in June 2029) and 60299 (granted in February 2017, expires in February 2027).

The applicant has also applied for resource consent for the suction dredging activities from Central Otago District Council (CODC) and Queenstown Lakes District Council (QLDC) and resource consent for the construction of the slipway at Queensberry from CODC. The applicant has requested that those applications are also publicly notified, and they will be heard in conjunction with this application. The applicant has advised that the construction of the slipway at Beaumont requires resource consent from Clutha District Council, however it will be sought separately to this process due to the small nature of that application.

Darryl Sycamore of Terramark Limited has provided a description of the proposal on pages 4 - 14 of the Application titled: Cold Gold Clutha Limited, Terramark Limited, 14 May 2021 (however it is noted that this report is an updated version of the original document dated 14 May 2021, which was lodged with ORC on 19 September 2022 and subsequently withdrawn). This description is adopted for this report. The key points of the activity are explained below.

Location of dredging

The application states that the mining will be limited to the exclusive area as specified on mining permits 60515, 60593 and 60299, with two areas excluded from the proposal due to high ecological values.

The extent of the proposed suction dredging activity is shown in

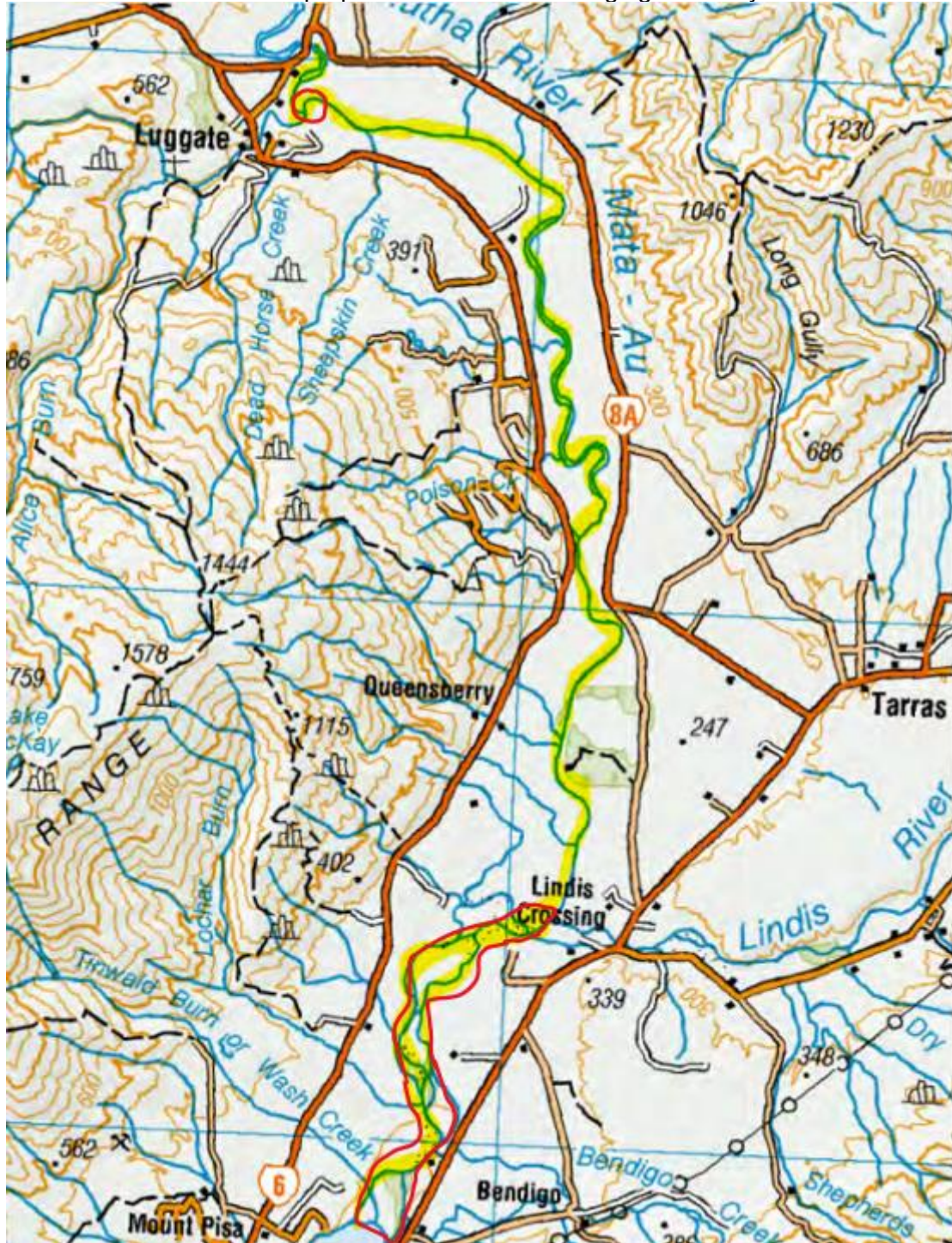


Figure 1 below, and can be described as extending from just downstream of the Luggate Bridge (upstream extent – NZTM 2000: E1305697 N5040203) to the confluence with Lake Dunstan (downstream extent – NZTM 2000: E1307834 N5018386), with the following two exclusions:

- From 100 m upstream of the confluence of Luggate Creek with the Clutha River / Mata-Au and for a distance of 350 m downstream, terminating at the downstream extent of the island within Devils Nook (between NZTM 2000: E1305436 N503955 and NZTM 2000: E1305651 N5039249, approximately 365 m); and
- The delta portion of the Clutha River / Mata-Au from the confluence with Lake Dunstan to the confluence with the Lindis River (between NZTM 2000:

E131105 N5024451 and NZTM 2000: E1307834 N5018386 approximately 8.2 km).

The length of the proposed mining activities (excluding the lengths of the two exclusion areas identified above) is approximately 22.7 km.

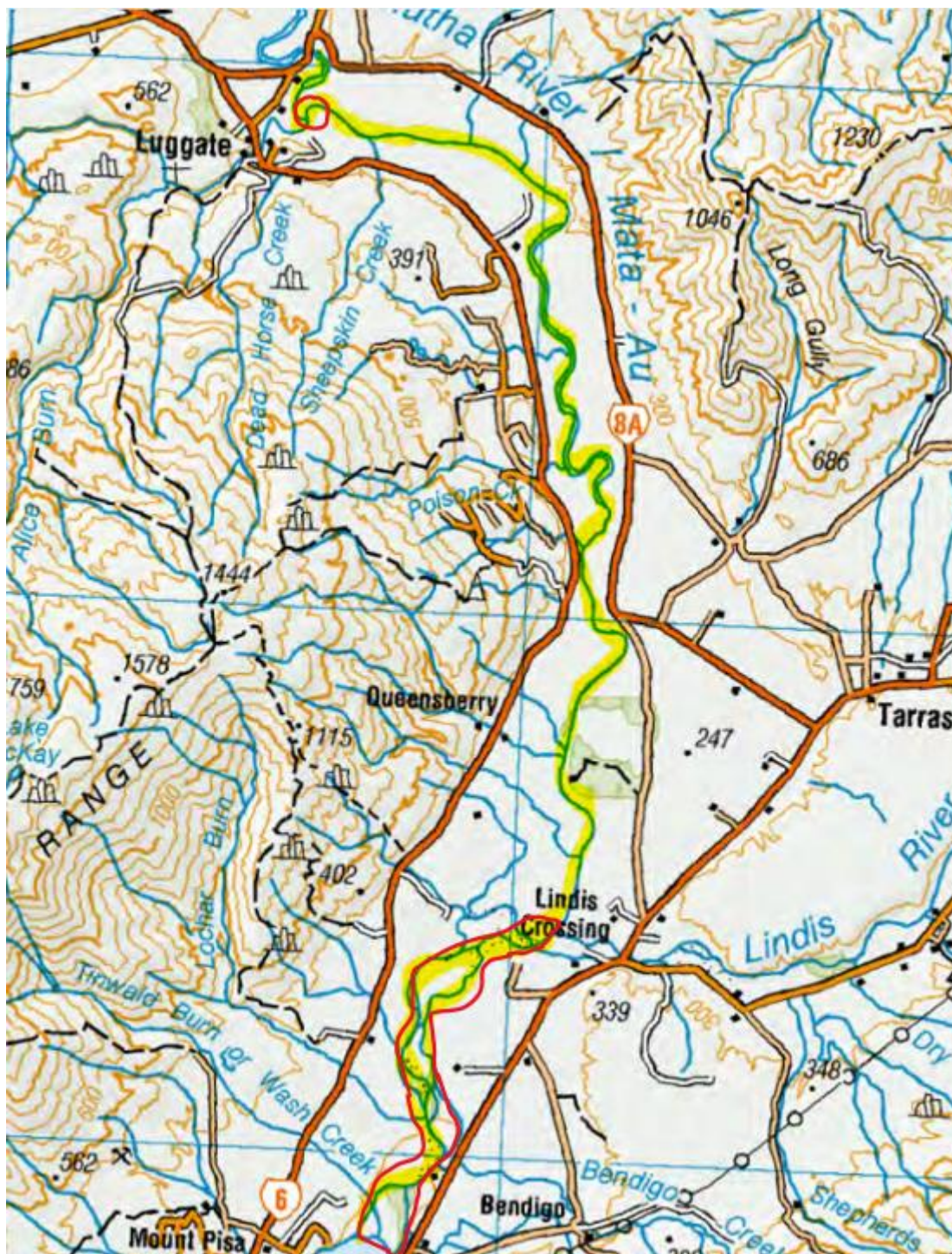


Figure 1: Map showing the extent of the proposed suction dredging activity (yellow) and approximate extent of exclusion areas (outlined red) in the Clutha River / Mata-Au (source: adapted from application documents)

The dredge

The dredge is a Maritime New Zealand registered vessel named 'CGC1', with vessel number MNZ 134266. It has been designed, built and surveyed in accordance with the Maritime Transport Operating Rules, has a valid Maritime Transport Operator Certificate (MTOC) and a Maritime Transport Operator Plan (MTOPlan).

The dredge operates on a steel pontoon catamaran and is 23.9 metres (m) in length and 6.6m in width, with a hull depth of 1.45m. The draft is 0.8m, it displaces approximately 75 tonnes, and is propelled by twin 550 horsepower Detroit diesel engines driving Ultrajet 375 water jets.

The superstructure is made from 100 millimetre (mm) thick steel/polystyrene which enclose the wheelhouse, hydraulic engine room and gold recovery room. The engines have wet exhaust systems to reduce noise and the hydraulic engine is fitted with top end exhaust silencers. The engine room walls are fitted with noise reduction linings.

The dredge is self-powered, and the main propulsion engines are used for manoeuvring on the river to position for dredging, re-fuelling and retreat during flood events. The dredge is normally static for dredging operations and manoeuvring generally occurs infrequently, approximately once per week.

The dredge uses two 500 kg main mooring anchors to position itself in the river for normal operations. These anchors are dropped into the wet bed of the river with anchor warps crossed over for stability. Consequently, anchor warps are located to the front of the vessel and typically submerged within 10-20 m of water, avoiding creating an impediment for other river users. Side lines are used on occasion, typically when moored against the riverbank during a flood event or for maintenance. During these occasions they are highlighted with marking tape and/or marker buoys. The dredge also occasionally utilises two 150 kg stern anchors where necessary for additional stability.

The crew access the dredge by way of a service tender. This craft is a 200 horsepower, 5.5m long rigid inflatable jet boat. This tender operates from either public access points or through private property with landowner permission. The tender is tethered alongside the dredge while crew are onboard, and it is moored just off the riverbank overnight.

The suction dredge utilises hydraulically driven high-pressure water pumps to generate water flow and suction in the main pipe via venturi induction jets. It is powered by a 600-horsepower marine diesel engine. The suction pipe has an internal diameter of 350 mm and is lowered to the riverbed by hydraulically driven winches. The river gravels are entrained in the main pipe as a slurry and then discharged onto a classification screen at the rear of the dredge. The gravels are discharged immediately back to the river while classified material is pumped on board and fed through the gold recovery systems (comprising standard gold riffle tables). All fines and water are then discharged to the river. No chemicals are involved in the process.

The hydraulic process uses hydraulic oils that are contained within the dredge by tray bunds in the event of a line bursting. The in-water hydraulic systems use biodegradable oil which, in the event of a leak or spillage, will break down faster than mineral oils and are non-toxic. Continuous maintenance is carried out and the MTOPlan specifies the procedures to be followed. Maritime NZ considers the dredging operation to hold a risk rating of 'low'.

Operation

Surface water is abstracted at a maximum rate of 400 litres per second (L/s) and 18,720 cubic metres (m³) per day (13-hour working day). The applicant has advised, however, that it is unlikely that water will be abstracted at this rate for this duration as it greatly reduces the chances of retaining gold. As described above, water abstracted is returned directly to the watercourse and as such, is a 'non-consumptive' take.

Dredging operations displace the gravels on the riverbed within the targeted area. The depths to which the bed is disturbed depend on the depth to bedrock (where the gold sits on the basement) or within layers in the gravel profile, which could range from 2m to 15m below the bed. Areas will not be re-worked, given there will be minimal gold in them. The dredge works upstream, typically in a 10 – 15m wide strip (up to 30m), and as the dredge moves forward any depressions are progressively reinstated by the gravels returned to the watercourse.

Areas are 'spot mined' where a site is identified as favourable for gold, and then that area is worked (i.e. the river bed is not systematically mined). The applicant describes that gold in the mid-reaches of the Clutha River / Mata-Au does not lie uniformly in the gravels from bank to bank, but rather in narrow, non-contiguous longitudinal banks. Mining occurs only in the wetted bed and is constrained by water depth due to the draft of the dredge being 0.8m.

The applicant has proposed a condition that no more than 1,500 m length of wetted bed and 0.9 hectare (ha) (9,000 m²) area is to be disturbed and worked at one time and indicated that disturbance would not exceed one ha per month and would not likely exceed 10 ha per calendar year. In essence, this provides a staging plan for the activity. The applicant has proposed a condition requiring that a GPS device be installed on or near the dredge to continuously record the location of the dredge.

The applicant has proposed a condition that there is a 20 m exclusion zone around any tributary confluence that is greater than 1 m in width, as they often hold important ecological values.

The dredge operates for a maximum of a 13-hour working day, seven days per week.

The applicant initially proposed a condition excluding dredging within 150 m of designated camping or recreation areas between 24 December and 3 January, and on Easter weekend. Further information was sought from the applicant regarding the locations of designated camping and recreation areas within the extent of the proposed dredging activity and whether any other holiday periods should also be excluded. The applicant has since advised that there are no areas within the proposed works area that should be avoided and as such this condition is no longer proposed as part of the application.

The applicant also initially proposed conditions relating to the preparation of an Annual Work Programme, to be prepared in consultation with Otago Fish and Game and the Department of Conservation. Further information was sought from the applicant regarding whether this condition had been discussed with Otago Fish and Game and the Department of Conservation, because consent conditions cannot confer responsibilities to any person except the consent holder. The applicant has since advised that the requirement for the Annual Work Programme to be prepared in consultation with Otago Fish and Game and the Department of Conservation does now not form part of the proposal.

Refuelling

Refuelling of the dredge is a two-step process. It involves filling of a 400 L tote tank on the tender vessel from a self-bunded diesel storage tank. The dredge is then refuelled up to 5,000 L per week *in situ*, with fuel decanted to the dredge once the tender is fixed to the dredge.

The details of the refuelling procedures are outlined in section 4.8 of the MTOP. They include ensuring there is adequate room in the dredge fuel tanks, keeping control of the refuelling nozzle and ensuring it is never left unattended when fuel is being transferred. A spill response protocol is also provided (section B5 of the MTOP) and spill kits are present at all refuelling points.

The self-bunded fuel storage tanks are owned and supplied by South Fuels. They are located well above the maximum flow levels on private property adjacent to the river.

Slipways

The application seeks resource consent for the construction of two slipways, one temporary slipway to be located on Rongahere Road at Beaumont for the removal of the dredge (at the same location as the one-off slipping activity previously authorised under RM20.325) and one permanent slipway near Queensberry for slipping the dredge back into the water and ongoing removal for repairs and inspections for the duration of the consent.

An example of a dredge being extracted via a slipway is shown in Figure 2 below.



Figure 2: Photo of dredge being extracted in Ettrick in 2016 for a maritime survey, to provide context of the activity (source: application documents)

Rongahere Road slipway

The proposed slipway at Rongahere Road is located downstream of the Beaumont Bridge, within the marginal strip (Crown Land Block I Crookston Survey District) administered by the Department of Conservation and accessed from a private property (being Section 59 Block I Crookston Survey District). The proposed slipway is located at the following coordinates NZTM 2000: E1329505 N4917655 and shown in Figure 3 below.

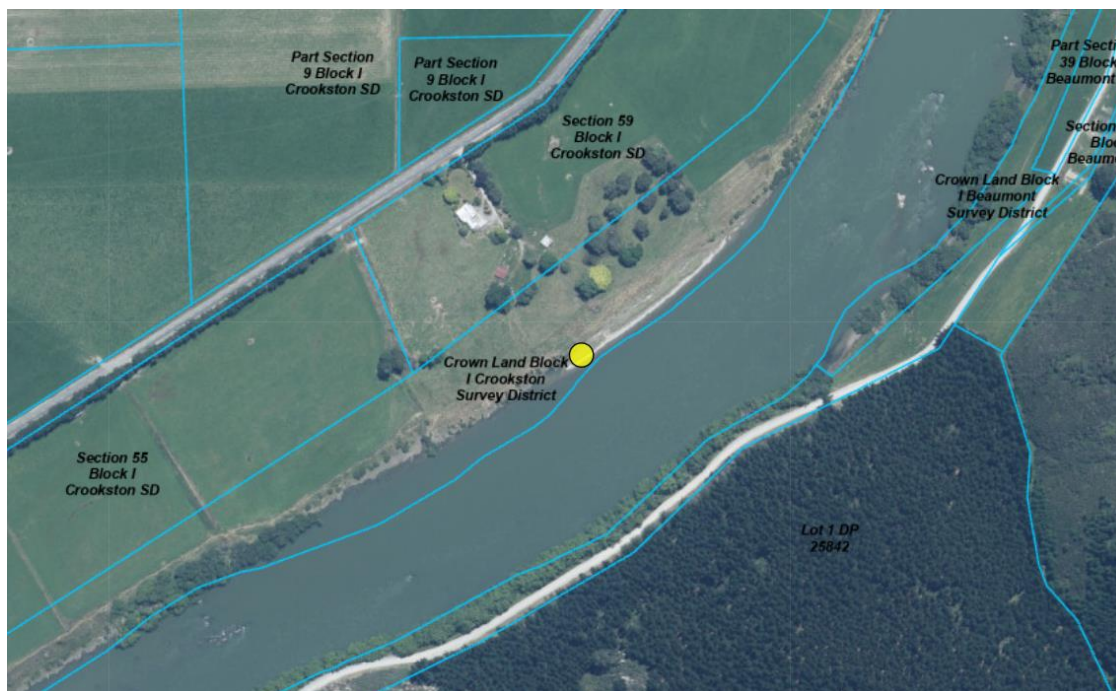


Figure 3: Location of the proposed Rongahere Road slipway (source: ORC mapping resources)

A gently inclining slipway will be cut into the riverbank using a 20-tonne excavator at a gradient no steeper than 2.5V:1H. The slipway will be approximately 10 m wide and extend from the wetted bed to an area where the dredge can be rolled onto airbags and loaded onto a flatbed transporter. Following removal of the dredge, the riverbank will be reinstated to match the existing bank profile. Works will be completed during a period forecast with no flood risk. The only vegetation disturbance may comprise the re-disturbance of exotic pasture species.

The applicant has advised that works within the bed of the river will take approximately one day.

Queensberry slipway

The proposed slipway at Queensberry is located on the true-right of the Clutha River / Mata-Au, approximately 5.4 km south-east of the township of Luggate, within Part Section 1 SO 24921. It is located at the following coordinates NZTM 2000: E1310061 N5035771 and shown in Figure 4 below. The site is accessed via private property being Lot 1 DP 466676.



Figure 4: Location of the proposed Queensberry slipway (source: ORC mapping resources)

The location of the proposed slipway is a low gradient river margin, and the applicant has advised that earthworks will be minimal. The slipway will be cut into the riverbank using a 20-tonne excavator (there will be no deposition of material required). The dredge will be taken off the flatbed transporter, onto airbags and slipped into the Clutha River / Mata-Au at this location. The applicant has advised that there is a possibility individual exotic tree species (willow or poplar) may be damaged or removed as part of the vehicle manoeuvring or slip process.

The applicant has advised that it is intended that the slipway will remain in place for the duration of the consent so that it can be used to remove the dredge as required for maintenance. The works within the bed of the river will be approximately one day.

Consent duration

The applicant seeks a consent duration expiring on 25 February 2031, to align with the expiry of mining permit 60593.

Supporting information

The applicant has provided the following documentation with the application:

- Resource consent application and supporting information report signed by the applicant and dated 14 May 2021 (lodged with ORC on 19 September 2022), including:
 - Freshwater Assessment prepared by E3 Scientific, dated July 2022
 - Cold Gold Clutha Limited Maritime Transport Operator Plan, version 7, dated June 2021
 - Noise testing report (between Etrick and Millers Flat), un-named expert, testing dated October 2013
 - Hydraulic and flow assessment of Rongahere Road slipway, Flood Sense Limited, site visit dated January 2021
- Further information response dated 19 April 2023, including:

- Cultural Impact Assessment: Cold Gold Clutha Suction Dredging on the Mata-au, Aukaha, dated 22 March 2023
- Ecology memo titled 'Response to Cultural Impact Assessment – Suction dredge gold mining in the Clutha River', e3 Scientific, dated 19 April 2023

The application includes a suite of draft consent conditions (Appendix 1 of application), generally reflective of those conditions on the existing resource consents RM20.087.01, .02 and .03 for suction dredging between the Roxburgh Dam and Tuapeka Mouth, to mitigate potential adverse effects of the activity.

The Ecology Assessment prepared by E3 Scientific also proposes some additional conditions and the applicant has advised in the response to the further information response that recommended conditions 1, 7, 10, 11, 12, 13, 14, 15, 16 and the additional condition at the top of page 44 also form part of the application (while some other recommended conditions do not form part of the application). Clarification is sought from the applicant as to whether the conditions recommended by E3 Scientific which do not form part of the proposal change the conclusions that have been reached by E3 Scientific in their assessment (described in more detail in section 6).

3.1 Compliance with Current Consent

Feedback on the proposal was sought from the Compliance Unit. They advised on 3 October 2022:

- Compliance with the existing consents is good, the activity was audited last year (2021) and there was no visible sediment plume.
- If consent is granted, conditions should include clear maps of the exclusion areas.
- If consent is granted, conditions include a 20 m exclusion around any confluence greater than 1 m in width (as proposed by applicant).
- If consent is granted, conditions requiring notification of the slipway works commencing should be required, with before and after photographs provided.
- If consent is granted, conditions requiring the Annual Work Programme should be continued. It is noted that the applicant has since withdrawn the proposed condition requiring an Annual Work Programme. The Annual Work Programme condition appeared to relate to managing effects on fish spawning and bird nesting and therefore it is considered most appropriate that the requirement for this condition is addressed through the assessment of effects on the environment. The aspect of the Annual Work Programme which outlines the location of works that year, could however, be addressed through a separate condition of consent, so that the Compliance Unit is aware of the current dredging location.

3.2 Description of the Environment

The proposed activity will be undertaken in the Clutha River / Mata-Au between downstream of the Luggate Bridge to the confluence with Lake Dunstan, with two exclusion areas being the Devils Nook and delta portion of the Clutha River upstream of Lake Dunstan to the confluence with the Lindis River. The following section provides a description of the existing environment, including any values identified in the schedules of the Regional Plan: Water for Otago (RPW).

Allocation Availability and Minimum Flows of the Clutha River / Mata-Au

The RPW provides for management of the take and use of surface water by defining allocation quantities able to be taken, while providing for water body levels. These restrictions do not apply to the Clutha River / Mata-Au main stem because, alongside Lakes Dunstan, Hawea, Roxburgh, Wanaka and Wakatipu and the Kawarau River, it is excluded from the requirement (see explanation of Policy 6.4.2).

Further to this, Policy 6.4.1 states that there are no minimum flows set by policies in the RPW for the Clutha River / Mata-Au.

Water Quality

There are thirteen sites monitored for river quality in the Clutha River / Mata-Au catchment, with data presented on the LAWA website¹. The most applicable site to the proposed suction dredging area is the 'Clutha River / Mata-Au at Luggate Bridge' site.

The LAWA website indicates that the Clutha River / Mata-Au at this location has 'excellent' water quality. The site is in the best 25% of all sites for *E. coli* (very likely degrading trend), clarity (state A, likely degrading trend), turbidity (indeterminate trend), total nitrogen (very likely degrading trend), total oxidised nitrogen (very likely degrading trend), ammoniacal nitrogen (state A, likely degrading trend), dissolved reactive phosphorus (no trend assessed) and total phosphorus (indeterminate trend).

Table 15.2.2 of Schedule 15 of the RPW presents the receiving water numerical limits and targets for achieving 'good water quality' in the Clutha River / Mata-Au. These limits are achieved when 80% of samples collected at a site, when flows are at or below median flow, over a rolling 5-year period, meet or are better than the limit set in the table. Of relevance is the turbidity limit of 5 NTU to be reached by the target date of 31 March 2025.

Ecology values

The applicant provided a Freshwater Assessment undertaken by E3 Scientific, dated July 2022 as an appendix to their application. The following information has been taken from that Freshwater Assessment.

The stretch of the Clutha River / Mata-Au where the activity is proposed varies between 70m and 100m in width. The riparian vegetation is predominantly a mixture of exotic communities, including crack willow and poplars which continuously line the shore for long stretches. There are areas of woody weeds (e.g., broom and gorse), kanuka woodland, pastoral farmland and residential properties. On some bends there are near vertical banks, which have minimal vegetation present, and gravel islands largely free from vegetation (except for the occasional tree lupin).

The variable but swift flows present within this stretch of the Clutha River / Mata-Au have resulted in a highly mobile bed substrate with a relatively uniform composition. It is mainly gravel, with some small boulders through to coarse gravels. The bed is unstable and loosely consolidated, and deposition of finer silts and sands has occurred typically along the edges of the river where the flow velocities are lower.

Within the proposed mining extent, the native upland bully (*Gobiomorphus breviceps*), common bully (*Gobiomorphus cotidianus*) and longfin eel (*Anguilla dieffenbachia*); and exotic brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*), are

¹ Land Air Water Aotearoa website - <https://www.lawa.org.nz/explore-data/otago-region/river-quality/clutha-rivermata-au/>

present. Clutha flathead galaxias and freshwater shrimp may also be present in the shallows of the main river body. The stretch of river proposed for mining is identified as spawning habitat for brown trout and rainbow trout, with a short stretch identified as kōaro spawning habitat.

There are no fish passage restrictions in the proposed mining location. There are fish passage restrictions elsewhere on the Clutha River / Mata-Au (e.g. Roxburgh and Clyde Dams). Contact Energy have a relocation and transfer programme that moves elvers (juvenile eels) upstream of the dams and takes large adult eels downstream of the dams to continue their migration pathway.

The macroinvertebrate health, abundance and diversity reflect the highly variable and unstable environmental conditions that are present within the Clutha River / Mata-Au.

With respect to macrophytes, didymo (*Didymosphenia geminata*) is present throughout the proposed mining area on rocks typically in the shallower sections on the inside of bends, and free-floating didymo was noted throughout the entire width and length of the proposed mining area. Lagarosiphon (*Lagarosiphon major*, also known as oxygen weed) was identified in one slow-moving pool within the proposal area.

Schedule 1A of the RPW outlines the natural and human use values of Otago's surface water bodies. The Clutha River / Mata-Au at this location (being 'between Alexandra and Lake Wanaka') is identified as having the following values:

- Large water body supporting high numbers of particular species, or habitat variety, which can provide for diverse life cycle requirements of a particular species, or a range of species.
- Gravel and rock bed composition of importance to resident biota.
- Presence of significant fish spawning areas for trout and salmon.
- Presence of significant areas for development of juvenile trout and salmon.
- Presence of riparian vegetation of significance to aquatic habitats.
- Presence of indigenous fish species threatened with extinction.
- Significant presence of trout, salmon and eel.
- Significant range of indigenous waterfowl.
- Significant habitat for flathead galaxiid (in the tributaries).

Schedule 1AA of the RPW identifies Otago resident native freshwater fish and their threat status. The Clutha River / Mata-Au is known to provide habitat for brown trout, rainbow trout, salmon, longfin eels (Declining), common bully, upland bully, and possibly kōaro (Declining), Clutha flathead galaxias (Nationally Vulnerable) and freshwater shrimp.

The Clutha River / Mata-Au is not specifically identified as a waterbody that is sensitive to suction dredge mining in Schedule 7 of the RPW. Within the extent of the proposed mining area there is an unnamed tributary of the Clutha River / Mata-Au (ID – 17), that is identified as being sensitive to suction dredge mining due to native fish habitat values. The activity is not proposed to extend into the tributary.

Schedule 9 of the RPW identifies regionally significant wetlands and values. The regionally significant Bendigo Wetland (ID – 7, see Figure 5 below) is located at the southern end of the mining area, however works are not proposed within or in proximity to the Bendigo Wetland.

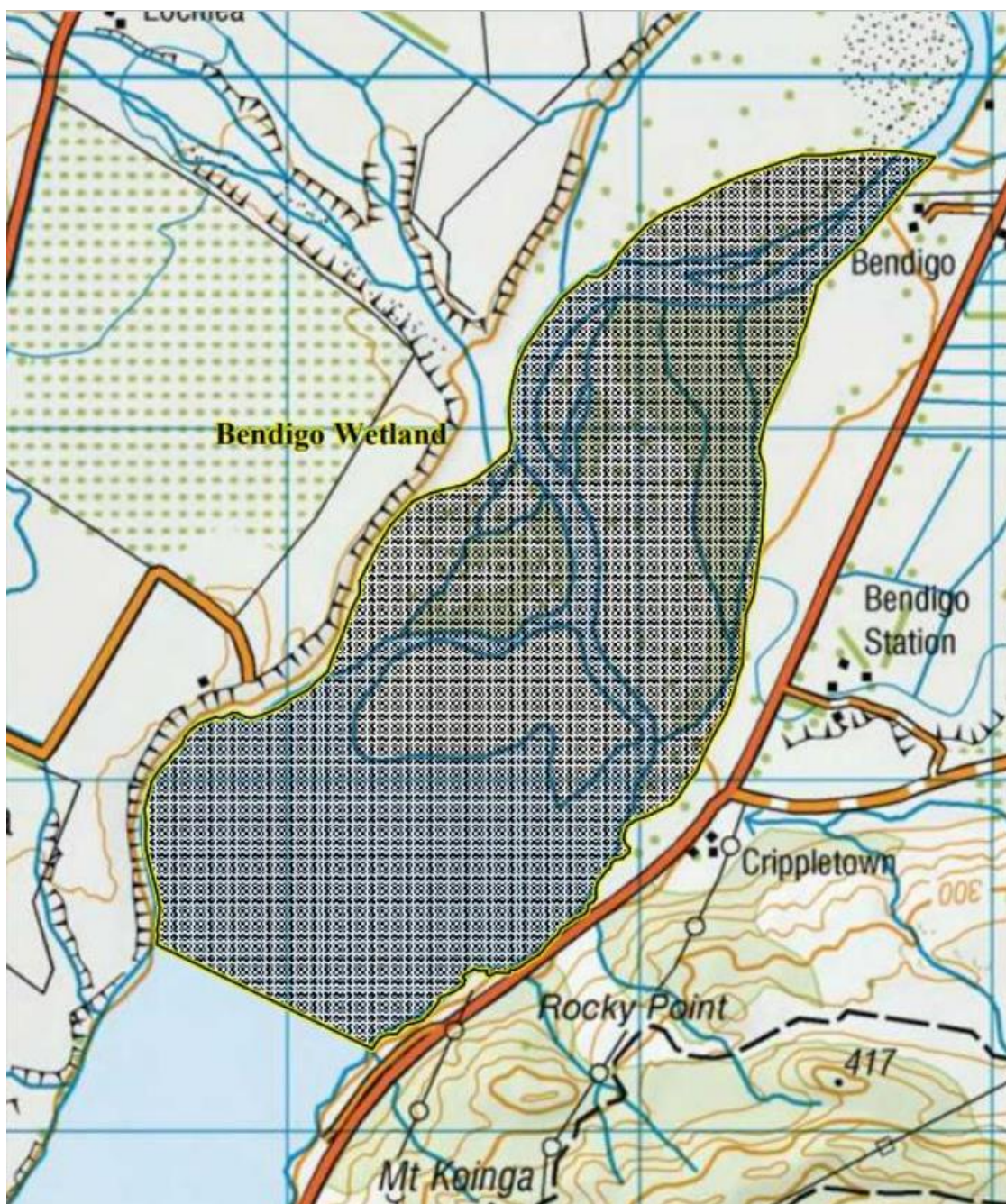


Figure 5: Location of Bendigo Wetland, Regionally Significant Wetland (source: ORC Maps)

Water supply values

Schedule 1B of the RPW identifies water takes used for public supply purposes (current at the time the RPW was notified in 1998). Within the stretch of the Clutha River / Mata-Au between Alexandra and Lake Wanaka (including Lake Dunstan) is the Clyde Water Supply and Cromwell Water Supply. Those Schedule 1B values listed in the RPW are both downstream of the proposed activity.

The following consented surface water abstractions are located within the proposed suction dredging extent (noting there is also likely to be other permitted activity abstractions):

- 2008.113.V1 (stockwater and irrigation)
- 2003.526.V1 (irrigation)
- RM13.355.01 (irrigation)

- 2009.205.V4 (irrigation, communal domestic, stock water, firefighting, frost fighting and light industrial supply)
- 2007.491 (irrigation)
- 2007.362.V2 (stockwater)
- 2005.562.V2 (irrigation)
- 2007.141 (irrigation and frost fighting)
- RM19.312.04 (irrigation, frost fighting and stock water)
- RM20.169.01 (irrigation, community supply, firefighting, frost fighting, stock water and dairy shed supply)
- 2009.205.V4 (irrigation, communal domestic, stock water, firefighting, frost fighting and light industrial supply)
- 2008.467.V1 (irrigation and domestic supply)
- 2001.496 (irrigation)
- RM16.165.02.V1 (irrigation and frost fighting)

Recreational values

The Clutha River / Mata-Au is a navigable river used by boats and a recreational resource for water sports activities, walking and cycling, camping and fishing.

There Clutha River / Mata-Au supports a number of fishery values and there are several Otago Fish and Game angler access points² to the Clutha River / Mata-Au within the extent of the proposed suction dredging including:

- CR 7 – access off Shortcut Road
- CR 8 – access off Kane Road
- CR 9 – access off Church Road
- CR 10 - access off Luggate-Tarras Road
- CR 11 - access off Luggate-Tarras Road
- CR 12 – access off Luggate-Tarras Road
- CR 13 – access off Luggate-Cromwell Road
- CR 14 – access off Tarras-Cromwell Road
- CR 15 – access off Maori Point Road
- CR 16 – access off Maori Point Road
- CR 17 – access off Tarras-Cromwell Road
- CR 18 – Clutha Catchment Angler Access Point, access off Lochar Road

Archaeological and heritage values

Schedule 1C of the RPW identifies registered historic places which occur in, on, under or over the beds or margins of lakes and rivers. Within the stretch of the Clutha River / Mata-Au between Alexandra and Lake Wanaka are the Bridge Piers on SH8 in Alexandra and the Earnsclough Bridge and Piers in Clyde. Those Schedule 1C values listed in the RPW are not in proximity to the proposed activity.

The stretch of river is associated with a significant number of archaeological sites as identified on the ArchSite website hosted by the New Zealand Archaeological Association. Broadly, there appear to be several locations with tailings, ovens, water races, gold workings, adze findspots, dredge and sluice channels, huts and shelters as well as the site of the Luggate Ferry near the Luggate Bridge.

Natural character and amenity values

² Otago Fish and Game website <https://fishandgame.org.nz/otago/freshwater-fishing-in-new-zealand/fishing-locations-and-access/>

A 'Natural Character, Riverscape and Visual Amenity Assessments' report³ was prepared by Boffa Miskell in October 2018 for ORC to support the Water Quantity plan change.

This report describes that the river form at this location is mostly narrow and single thread, contained between steep terrace faces and occasional alluvial landforms. Downstream of the Lindis River confluence it transitions to a delta and widens to a braided and meandering form.

The landscape comprises large-scale landforms, dominated by pasture, vineyards, shelterbelts and isolated areas of kanuka. There are open views and little built form, with no bridges crossing the river in the location of the proposed suction dredging (although the Luggate Bridge is located just upstream).

Vegetation along the margins comprises wilding pines, Douglas fir, kanuka shrubland, briar shrubland, exotic grassland, short tussock grassland, willows and some groups of Lombardy poplars. The delta at the head of Lake Dunstan is a wildlife reserve and favoured waterfowl habitat.

The report states that particularly impressive landscape features include remnant older outwash surfaces between Bendigo and Tarras, including the Bendigo Terrace and The Bend Terrace.

The water is brightly coloured due to glacial origins and has high clarity, providing contrast with the dominant colours of the surrounding landscape. Seasonal colours of the exotic riparian vegetation also contribute to the scenic values.

Didymo is present, and where seen reduces visual amenity.

Further to this, the Clutha River / Mata-Au is identified as an Outstanding Natural Landscape in the Proposed Queenstown Lakes District Plan.

Cultural values

Schedule 1D of the RPW identifies the spiritual and cultural beliefs, values and uses associated with water bodies of significance to Kāi Tahu. The Clutha River / Mata-Au between Alexandra and Lake Wanaka is identified as having the following values:

- Kaitiakitanga: the exercise of guardianship by Kāi Tahu, including the ethic of stewardship.
- Mauri: life force.
- Waahi tapu and/or Waiwhakaheke: sacred places; sites, areas and values of spiritual values of importance to Kāi Tahu.
- Waahi taoka: treasured resource; values, sites and resources that are valued.
- Mahika kai: places where food is procured or produced.
- Kohanga: important nursery/spawning areas for native fisheries and/or breeding grounds for birds.
- Trails: sites and water bodies which formed part of traditional routes, including tauraka waka (landing place for canoes).
- Cultural materials: water bodies that are sources of traditional weaving materials (such as raupo and paru) and rongoa (medicines).

³ Natural Character, Riverscape and Visual Amenity Assessments report - https://www.orc.govt.nz/media/6329/c18056_clutha-riverlandscape_natural-character-study-final_20181015.pdf

The Clutha River / Mata-Au is subject to a statutory acknowledgement under the Ngāi Tahu Claims Settlement Act 1998. The details of the Ngāi Tahu association with the Mata-Au are described in detail in Schedule 40, and I have summarised them below.

- The Mata-Au takes its name from a Ngāi Tahu whakapapa that traces the genealogy of water, and as such is seen as a descendent of the creation traditions. This represents a link between the cosmological world of the gods and present generations, the histories reinforce tribal identity and solidarity, and continuity between generations.
- It was part of a mahinga kai trail that led inland and was used by several Otakou hapu. The knowledge of whakapapa, traditional trails and Tauranga waka, places for gathering kai and other taonga, ways in which to use the resources of the river, relationships of people with the river and their dependence on it, and tikanga are values that remain important to Ngāi Tahu.
- The river was also very important for the transportation of pounamu from inland areas to settlements on the coast, and as such there are numerous sites of significance located along the river. There are also several urupa and battlegrounds located along the river.
- Historically, the Mata-Au was a boundary line between Ngāi Tahu to the north and Ngāti Māmoe to the south. Eventually the unions between the families were to overcome these boundaries.
- Mauri is a critical element of the spiritual relationship of Ngāi Tahu Whanui with the river, and it represents the essence that binds the physical and spiritual elements of all things together, generating and upholding all life.

The applicant has commissioned a Cultural Impact Assessment (CIA) by Aukaha. The CIA describes the associations of mana whenua with the Clutha River / Mata-Au, including:

- Wai Māori – The Clutha River / Mata-Au links the pure waters of the Upper Lakes with the bountiful coastal environment and is an awa of status and significance for Kāi Tahu.
- Wāhi Tūpuna – A myriad of wāhi tūpuna are recorded along the length of the Clutha River / Mata-Au, attesting to its long-standing importance as a food source, place of travel and activity, and reflecting the physical and spiritual connection between the mountains and coast. In particular:
 - Te Rua Tūpāpaku (Luggate) – A kāika mahika kai where weka, tuna and kāuru were gathered; also recorded as a fortified permanent pā and that Rāwiri Te Maire and Te Maihāroa lived there.
 - Autāia (near Queensberry) – A kāika mahika kai where weka, tuna and kāuru were gathered.
 - Te Kōareare o Te Pāhi (downstream of Queensberry) – A wāhi mahika kai where tuna and weka were gathered.
 - Kā Iwi o te Weka (downstream of Lindis Crossing) – A wāhi mahika kai where tuna and weka were gathered.
 - Mahaka Katia (northern end of Lake Dunstan) - A wāhi mahika kai where tuna and weka were gathered.
 - Otakihia (northern end of Lake Dunstan) – Rapids that were located at what is now the northern end of Lake Dunstan.
 - The CIA also presents a list of recorded Māori archaeological sites, namely umu, rock shelter, artefacts (toki and patu onewa) which signify the long history of occupation and use.
- Mahika kai and biodiversity – The river is recorded as having been a bountiful source of weka and tuna, which were easily processed for long-term storage. Kāuru was extensively gathered and cooked along the Mata-Au in the past as a form of porridge called waitau kāuru. The river provided a ready source of food and access to transportation for trade.

The CIA describes the impact of the 1848 Kemp's Deed and the loss of ancestral lands and access to wāhi tūpuna, mahika kai, and connection to the whenua. It also describes the impact that infrastructure (e.g. roads, towns and dams), historical mining following gold being struck in Otago in 1862, and pastoralism have had on cultural values.

3.2.1 Site Visit

A site visit of the location of the current suction dredging activities south of the Beaumont Bridge and the proposed Rongahere Road slipway was completed by myself on behalf of Otago Regional Council on 13 October 2022.

4. Status of the Application

This application requires assessment under the Regional Plan: Water for Otago (RPW) and the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NESF).

4.1 Regional Plan: Water for Otago

Disturbance of the bed of a river

With respect to the suction dredging activity, rule 13.5.1.7 of the RPW permits suction dredge mining within the bed of the river, provided that the following conditions are met:

- (a) *The internal diameter of the nozzle does not exceed 150 mm; and*
- (b) *The mining activity does not occur in those rivers, or parts of river, listed in schedule 7 during any identified time period; and*
- (c) *The mining activity is not carried out within 20 metres of any structure which has foundations in the riverbeds, or any ford or pipeline; and*
- (d) *The activity does not cause any flooding or erosion; and*
- (e) *No refuelling is carried out while the dredge is within the wet bed of the river unless an effective spill tray has been installed; and*
- (f) *The area dredged lies within the wet bed of the river, and no material is removed from within or under the banks of the river; and*
- (g) *No suction dredge is operated within 500 metres of another dredge; and*
- (h) *No explosives or earthmoving machinery apart from the dredge is used to move material in the riverbed; and*
- (i) *Any rocks moved to allow suction dredging are to occur are returned as close as possible to the site from which they were removed; and*
- (j) *There is no conspicuous change in the colour or visual clarity of the water body beyond a distance of 100 metres downstream of the point of discharge of the dredge; and*
- (k) *No lawful take of water is adversely affected as a result of the bed disturbance.*

The applicant has advised that condition (a) cannot be met because the internal diameter of the nozzle is 350 mm and condition (e) is not technically met as the refuelling arrangement is not a spill tray as such. With respect to condition (j) the applicant has advised that testing has confirmed that the proposal can comply with this, however, seeks a zone of reasonable mixing of 200 m so the proposal also breaches this standard.

In accordance with Rule 13.5.3.1, except as provided for by Rules 13.5.1.1 to 13.5.2.1 (which are not relevant in this instance), the alteration of the bed of any lake or river for the purpose of suction dredging is a **discretionary activity**.

Due to the nature of the proposed slipways (being excavation of the riverbank to allow for the removal of the dredge) they are not considered to be 'the erection or placement of a structure' and as such only those rules relating to the alteration of the bed (chapter 13.5) are of relevance. There are no relevant permitted activity rules, so resource consent is required for a **discretionary activity** for the alteration of the bed for the construction of a slipway under Rule 13.5.3.1.

Take and use of surface water

Rule 12.1.2.2 of the RPW allows the taking and use of water from the main stem of the Clutha River / Mata-Au as a permitted activity provided the following conditions can be met:

- (a) The take does not exceed 100 litres per second, nor 1,000,000 litres per day;*
- (b) No more than one such take occurs per landholding;*
- (c) No back-flow of any contaminated water occurs to the water body;*
- (d) Fish are prevented from entering the intake structure.*

The applicant has requested abstraction at a rate of up to 400 L/s, up to 18,720,000 L/day (18,720m³ /day; 13 hours of operation) and up to 6,306,674m³/year (which is based on an average daily take of 17,278m³ for a 12-hour workday). Due to the nature of the operation, fish are not able to be prevented from entering the intake structure.

Policy 6.4.2 of the RPW states that surface water takes that immediately return all water taken to the source water body are not factored in calculating primary allocation, while the explanation states that allocation limits will not apply to surface water takes from the main stem of the Clutha / Mata-Au. The applicant's proposed take is therefore non-consumptive and there is no applicable primary allocation limit.

The proposal cannot comply with the abstraction rate and volume, or the requirement that fish are prevented from entering the intake structure. In accordance with Rule 12.1.5.1, except as provided for by Rules 12.1.1.1 to 12.1.4.7 (which are not relevant in this instance, the proposed take and non-consumptive use of water from the main stem of the Clutha River / Mata-Au associated with the suction dredging activities is a **discretionary activity** under Rule 12.1.5.1 of the RPW.

Discharge of contaminants to water

Operation of the suction dredge will result in the discharge of the abstracted water and bed material back to the river. This is a discharge of contaminants to water (rather than the re-mobilisation of bed material) because the sediment physically leaves and re-enters the water column.

Rule 12.C.1.1 permits the discharge of water or any contaminant to water, provided the following conditions are met:

- (a) The discharge does not result in flooding, erosion, land instability or property damage; and*
- (b) There is no discharge of water from one catchment to water in another catchment; and*
- (c) The discharge does not change the water level range or hydrological function of any Regionally Significant Wetland; and*
- (d) When the discharge, including any discharge from a drain or water race, enters water in any lake, river, wetland or the coastal marine area; the discharge:*

- (i) Does not result in:
- (1) A conspicuous change in colour or visual clarity; or
 - (2) A noticeable increase in local sedimentation, in the receiving water (refer to Figure 5); and
- (ii) Does not have floatable or suspended organic materials; and
- (iii) Does not have an odour, oil or grease film, scum or foam; and ...
- [the remainder of this rule relates to discharges to drains and water races]*

The proposed discharge cannot comply with condition (d)(i)(1) or (2) as it will result in a conspicuous change in colour or visual clarity, or noticeable increase in local sedimentation in the receiving water.

Rule 12.C.3.2(i) is not applicable if the discharge is provided for by a rule in 12.C.0, 12.C.1 or 12.C.2. None of these rules are applicable to the proposed discharge. As such, the proposed discharge of sediment-laden water to surface water from dredging operations requires resource consent for a **discretionary activity** under Rule 12.C.3.2(i).

With respect to any discharges from the construction of the slipway, Rule 13.5.A.1 states that '*discharges of bed material resulting from the alteration of the bed of a lake or river... are addressed only through rules in section 13.5*' and '*alteration includes any disturbance, and the associated remobilisation (discharge) and redeposition (deposit) of bed material already present...*'. As such, the discharge of any sediment-laden water associated with the construction of the slipway is addressed under Rule 13.5.3.1 as a **discretionary activity**, as described in the land use consents section above.

Plan Change 7

Plan Change 7 was made operative on 5 March 2022. It provides objectives, policies and rules that manage the replacement of expiring deemed permits and water permits and is the first step in the transition from the RPW to a new Land and Water Regional Plan.

No rules from PC7 are applicable to this application as it is not in relation to a currently authorised water permit. The duration is, however, to be determined in accordance with the policies in Chapter 10A.

4.2 National Environmental Standards for Freshwater

The NESF sets standards to regulate activities that pose risks to the health of freshwater and freshwater ecosystems. This legislation sets out permitted activity standards for farming activities, activities in natural wetlands, reclamation and the passage of fish affected by structures (culverts, weirs and passive flap gates).

The relevant regulations for this application are regulations 53 and 54. Regulation 53 states that the taking, use or discharge of water within a natural wetland is a prohibited activity if it results (or is likely to result) in the complete or partial drainage of all or part of the natural wetland and the activity does not have another status under regulations 38 to 51. Regulation 54 states that the taking, use or discharge of water within, or within a 100m setback from a natural wetland, is a non-complying activity.

The Bendigo Wetland (regionally significant wetland) is located within the extent of the mining permits that are the subject of this application, however the applicant has advised that the delta portion of the river from the confluence with Lake Dunstan and terminating at the confluence with the Lindis River is excluded from this proposal. The

applicant has advised the aforementioned regulations do not apply and I concur with this assessment based on the proposed exclusion area around the Bendigo Wetland.

With respect to the fish passage, the dredge is not considered to be a structure as it relates to these provisions. There are no other relevant provisions.

As such, no resource consents are triggered under the NES-F.

4.3 Overall Activity Status

Overall, the application is considered to be a **discretionary activity**.

5. Other Authorisations

The applicant has also applied for resource consent for the suction dredging activities from Central Otago District Council (CODC) and Queenstown Lakes District Council (QLDC) and resource consent for the construction of the slipway at Queensberry from CODC. The applicant has requested that those applications are also publicly notified. They will be heard in conjunction with this application. Ms Kirstyn Royce is the processing planner for both the CODC and QLDC applications.

The applicant has advised that the construction of the slipway at Beaumont requires resource consent from Clutha District Council (CDC), however it will be sought separately to this process due to the small nature of that application.

The applicant has advised that concessions will be required from the Department of Conservation and Land Information New Zealand for the use of land and the river margins associated with the creation of the slipway.

Authorisation may also be required for the transportation of the dredge within the roading network from Waka Kotahi and Contact Energy.

6. Assessment of Adverse Environmental Effects

Sections 95D and 104(1)(a) of the Act require the Council to have regard to any actual and potential effects on the environment of allowing the activity. For Section 104(1)(a) this includes both positive and adverse effects whereas 95D is restricted to only adverse effects.

In considering the adverse effects, the Consent Authority may disregard those effects where the plan permits an activity with that effect, otherwise known as the “permitted baseline”. In the case of this application, there are three rules where understanding the permitted baseline may be helpful.

Rule 13.5.1.7 of the RPW permits suction dredge mining within the bed of the river, provided that the conditions are complied with. Those permitted activity conditions which are not complied with are:

- the internal diameter of the nozzle not exceeding 150 mm (proposed is 350 mm),
- no refuelling is carried out within the wetted bed unless there is an effective spill tray (the applicant notes that although the arrangement is not a spill tray as such, the intent of this condition is met),
- there is no conspicuous change in colour or visual clarity at 100 m downstream (proposed is 200 m).

Rule 12.1.2.2 permits the take and use of water, provided the conditions are complied with. Those permitted activity conditions which are not complied with are:

- the rate of abstraction does not exceed 100 L/s or 1,000,000 L/day (proposed is 400 L/s and 18,720,000 L/day),
- fish are prevented from entering the intake structure (fish may be sucked into the dredge, although it is understood this would be a very rare occurrence).

Rule 12.C.1.1 permits the discharge of water and a contaminant to water, provided the conditions are complied with. Those permitted activity conditions which are not complied with are:

- the discharge does not result in a conspicuous change in colour or visual clarity (proposed 200m zone of reasonable mixing),
- the discharge does not result in a noticeable increase in local sedimentation (proposed 200m zone of reasonable mixing).

These rules form the permitted baseline, and it is those effects arising from the proposal beyond the permitted baseline that are the crucial elements for consideration.

The applicant has assessed the environmental effects in their application on pages 17- 31, including Freshwater Assessment prepared by E3 Scientific dated July 2022 and Flood Sense Limited report dated January 2021.

The assessment has been audited by myself (planning), Ms Annabelle Coates of Babbage Consultants Limited (ecology), and Mr Colin Macdiarmid of GeoSolve Limited (engineering). Key aspects of the assessment and the main effects are discussed below for completeness. I consider that the adverse effects of the activity on the environment relate to:

- Allocation availability
- Minimum flows
- Water quality (sediment and other contaminants)
- Aquatic ecology (suspended sediments, habitat disturbance, fish spawning and migration, fish entrainment and macrophyte disturbance)
- Indigenous birds
- Downstream water users
- Recreational water users
- Heritage values
- Natural character and amenity
- Natural hazards
- Cultural values

The applicant provided a response to the further information request under section 92 (sent 12th October 2022) dated 19th April 2023 including Cultural Impact Assessment dated 22 March 2023 and additional Ecology memo dated 19 April 2023. This has been audited by myself only, and there are matters within the further information request that require further clarification and review by Ms Coates before determination as to the level of effect can be drawn.

Mitigation measures have been proposed by the applicant that they are volunteering to be imposed, should consent be granted. These mitigation measures will be considered as part of the section 95 recommendations as they form part of the application. Any other conditions (such as those recommended but not agreed to) by specialist auditors cannot be considered as part of the section 95 assessment. The appropriateness of the proposed mitigation measures is not a consideration of the

section 95 assessment, with the focus only being on adverse effects and whether they are proposed to be mitigated.

6.1 Effects on Allocation Availability

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 define a water take to be non-consumptive when:

- 1) the same amount of water is returned to the same water body at or near the location from which it was taken; and
- 2) there is no significant delay between the taking and returning of the water.

As described earlier, the RPW states that there are no allocation limits for the Clutha River / Mata-Au. Regardless, policy 6.4.2 of the RPW states that surface water takes that immediately return all water taken to the source water body are not factored in calculating primary allocation.

The applicant's proposed take is therefore non-consumptive and due to its location, is not subject to a primary allocation limit.

Due to this, and because it is not practical to install a water meter for this type of activity, the applicant has not proposed any water metering.

As the proposed abstraction is non-consumptive and there is no primary allocation for the main stem of the Clutha River / Mata-Au, the effect of the abstraction on the surface water allocation availability is nil.

6.2 Effects on Minimum Flows

Minimum flows may be set for a river or catchment for the purpose of restricting primary allocation takes of water. A minimum flow provides for the maintenance of aquatic ecosystem and natural character values of water bodies, while providing for the sustainable taking of water for use. Once set in Schedule 2A of the RPW, they are imposed on all relevant consents in that catchment. When a minimum flow is breached, all consents to take water as primary allocation (with some exceptions including community water supply abstractions) must cease.

Policy 6.4.4 of the RPW states that for new takes in a catchment outside Schedule 2A (being the minimum flow for primary allocation takes and primary allocation limits), minimum flows will be set on a case-by-case basis. These will recognise the water use needs of the community while providing for the aquatic ecosystems and natural character of the watercourse. Consents will be subject to a review clause to enable any minimum flow added to Schedule 2A to be applied.

Policy 6.4.1 however, states that minimum flows set by policies in Chapter 6 do not apply to surface water takes from the main stem of the Clutha River / Mata-Au, or where surface water is immediately returned to the waterbody.

The surface water take aspect of this application is non-consumptive as all water taken is immediately returned to the water body. Consequently, the adverse effects of the abstraction on the minimum flow of the Clutha River / Mata-Au are nil.

6.3 Effects on Water Quality

Sediment

The proposed suction dredging operation will result in the discharge of sediment-laden water to the Clutha River / Mata-Au. If not assessed or managed appropriately, this could have adverse effects on the water quality of the Clutha River / Mata-Au, and in turn the aquatic ecology of these water bodies (which are discussed further in the section below).

As described earlier, it has been confirmed that this discharge is considered to be the discharge of contaminants to water (rather than the re-mobilisation of bed material) because the sediment physically leaves and re-enters the water column. As such, it requires a full assessment of effects.

The applicant has proposed a reasonable mixing zone of 200 m from the point of discharge, meaning they have applied for resource consent to allow a visually conspicuous plume up to 200 m beyond the discharge point. The application describes that typically the sediment will drop out of the water column within 25 m, there will be no discolouration evident beyond 50 m and the dredging will be managed such that the visual plume does not extend beyond 100 m, however they advise that a 200 m zone is sought "*as a precautionary approach should any unforeseen pulses of clays or finer sediments be released that do not drop out of the water column quickly to ensure the dredge does not fall into non-compliance*".

Justification of this length for a reasonable mixing zone was sought in the section 92 request, as the reasoning that a 200 m zone is sought to ensure the applicant does not breach conditions was not considered to be appropriate justification, and because E3 Scientific recommended a zone of 100 m and Ms Coates agreed with this.

The applicant provided a detailed response to this question (question 9 of the section 92 response), including comparison to mixing zones in other regional council plans as the RPW does not define a distance. The applicant also points to case law (*Southland Regional Council v New Zealand Deer Farms Limited, 2004*) in which the decision adopted the 'case-by-case approach'. I agree that the zone of reasonable mixing is to be determined on a case-by-case basis and dependant on site specific factors.

In the section 92 response the applicant then went on to describe a number of other consent applications for suction dredging which have recently been assessed by ORC with respect to ecology values. However, of these assessments the applicant only provided detail on the zone of reasonable mixing distance for one of these consents (mining permit 60566 in the Kye Burn, no consent number provided – 200 m), which is to what this question related. Whilst how other consents have been assessed provides good context, it is important that consents are assessed on a case-by-case basis individually on their merits.

The applicant has put forward some zone of reasonable mixing conditions in response to question 13 of the section 92 response (no conspicuous change in colour or visual clarity after 200m from the discharge point, to be measured using visual estimations along the river margin, and actions to be taken if a conspicuous change is noted between 150m and 200m, or greater than 200m). The applicant, however, also advises in response to question 16 they welcome a different suggested approach by E3 Environmental in their Ecology memo (dated 19 April 2023) which involves measurement using a Secchi disk 100m and 200m downstream of the dredge at least once per day.

The details of the condition and monitoring method will need to be clarified, however based on effects of the discharge on water quality alone (effects on aquatic ecology addressed below), I would be comfortable with a 200 m zone of reasonable mixing for the following reasons:

- The plume is typically constrained to a narrow channel.
- The size of the Clutha River / Mata-Au at the location of the proposed works is significant, with the wetted bed being approximately 75-80 m wide.
- Schedule 15 of the RPW sets a limit of 5 NTU to be reached by 31 March 2025 in the Clutha River / Mata-Au and the E3 Scientific report has advised that sediment levels during sampling from the sediment plume varied from 1.62 NTU at 5 m behind the dredge to near 1.13 NTU at 50 m behind the dredge.
- Effects on other water users can be appropriately managed (see section 6.6).

Overall, I consider that the adverse effects of the proposal on water quality will be less than minor.

Other contaminants

The proposed activity involves the use of machinery, as well as *in situ* refuelling. These activities have the potential to release contaminants into the environment (e.g. fuel, oil, grease). The applicant has proposed several measures in their application to mitigate risks associated with these activities, including proposing a condition that there be no contaminants discharged and providing details of the refuelling procedure (such as automatic cut-off on the refuelling equipment, additional shutoff valve fitted to the handle and a remote stop push button, bunding of the onshore fuel tank and spill kit availability and training).

Assuming compliance with the proposed mitigation measures, I consider that the risk of adverse effects from the discharge of these 'other contaminants' on water quality is likely to be less than minor

6.4 Effects on Aquatic Ecology

The applicant commissioned E3 Scientific to prepare a Freshwater Assessment for the proposal. This assessment involved desktop research and a site visit. The desktop component comprised a review of existing ecological information to determine habitats and species likely present on the site, and review of the existing water quality assessment completed for RM20.087. The site visit involved an ecological assessment of habitats, values and fish passage; visual macrophyte survey and macroinvertebrate sampling. The assessment of effects was completed using the Environment Institute of Australia and New Zealand Ecological Impact Assessment (EclA) guidelines. The results of the Ecological Assessment of the site have also been used to describe the existing environment in section 3 of this report.

The information has been audited by Ms Coates on behalf of ORC.

The applicant also provided a memorandum prepared by e3 Scientific as part of the response to the request for further information (titled 'Response to Cultural Impact Assessment – Suction dredge gold mining in the Clutha River' and dated 19 April 2023). Due to the applicant's request to proceed to notification as quickly as possible, and some clarification required on the proposed conditions that form part of this application, this memo has not yet been reviewed by Ms Coates. Following clarification of the matters outlined in the section that follows, additional advice will be sought from Ms Coates.

Potential adverse effects from the proposal on aquatic ecology are assessed below.

Suspended sediment

An increase in suspended sediment within the water column can adversely affect aquatic ecology, through reducing visual feeding abilities, reducing favourable water quality parameters for fish survival and increasing rates of sediment deposition which can smother macroinvertebrates or reduce habitat quality.

The applicant's Freshwater Assessment concluded that the effects of the sediment discharge are 'low' because the majority of the sediments are found to fall out of the water column within 50m, and visible discolouration would be hard to discern beyond 100m. The currents and mixing patterns of the Clutha River / Mata-Au mean that the plume is typically constrained to a narrow channel, and as a result fish species will not be greatly displaced. Further, the dredge is unable to operate in the shallower depths, which will therefore provide a refuge for smaller fish.

Due to the dynamic nature of the Clutha River / Mata-Au, E3 Scientific note that any fine sediments would have likely been remobilised during the next high flow event and are unlikely to be present on the substrate for any great length of time.

The original Freshwater Assessment completed by E3 Scientific recommended a condition requiring that the zone of reasonable mixing be 100 m downstream from the point of discharge. Ms Coates also supported this. The applicant, however advised they would like to proceed with a reasonable mixing zone of 200 m. As such, further information was sought in the section 92 request as to whether a zone of reasonable mixing of 200 m was supported by E3 Scientific. E3 Scientific prepared an Ecology memo (dated 19 April 2023) where they have referred to studies which address potential effects of high sediment loads on different species of fish and macroinvertebrates. Overall, they advised that they 'do not foresee an effect of suspended sediment on aquatic ecology other than some avoidance behaviour'.

As described above, E3 Scientific have gone on to recommend some monitoring that could be undertaken (which the applicant has advised they are comfortable with), however the applicant has also proposed other conditions in response to question 13 of the section 92 response. The details of the condition and monitoring method will need to be clarified.

I will seek advice from Ms Coates as to whether she agrees with the E3 assessment that a 200 m zone of reasonable mixing would result only in some avoidance behaviour and adverse effects on ecology would be 'low'.

Based on the assessment above, I am comfortable that the level of effect of the proposed discharge with a zone of mixing of 100m will be less than minor, however further assessment including advice from Ms Coates is required to confirm the level of effect of a zone of reasonable mixing of 200 m. I suggest this could be likely be quite easily closed out through a meeting between both the applicant and council's ecologists.

Habitat disturbance

Suction dredge mining disturbs the streambed as it sucks up material up to be screened for gold. The Freshwater Assessment states that this will result in the temporary loss of spawning and feeding habitat available, however the coarser material will be deposited immediately which will largely reflect the substrate composition prior to disturbance.

Macroinvertebrate communities will be disturbed and lost from the areas where stream bed disturbance occurs. The applicant's Freshwater Assessment references a

study of the Pomahaka River which found no clear difference in the post-dredging macroinvertebrate communities as a result of gold dredging. The diversity and abundance of macroinvertebrates in this section of the Clutha River / Mata-Au is very low, which is considered to be reflective of a highly disturbed and mobile environment. The effects on macroinvertebrate communities will be temporary, and dredged areas will be readily re-colonised by macroinvertebrates from upstream and surrounding areas, noting as well that no dredging will occur in depths less than 0.8m so re-colonisation can occur from these areas. Further to this, due to the nature of suction dredging, areas will only be disturbed once. The Freshwater Assessment has determined the effects of the activity on habitat disturbance to be 'low'.

To mitigate effects on habitat disturbance, the applicant proposes that no beaches that are part of the dry bed when the flow is 400 cubic metres per second are to be disturbed or mined, to protect the habitats in these locations.

Ms Coates did not raise any concerns with the E3 Scientific assessment of effects on habitat disturbance.

Overall, I am comfortable that the adverse effects on habitat disturbance will be less than minor.

Fish spawning and migration

The applicant proposes to undertake dredging seven days a week. As such, the dredge will be operating during fish spawning and migration periods identified for the species present in this location. Table 1 below replicates data from the E3 Scientific report which describes the spawning periods of the species present in this location of the river.

Table 1: Fish spawning periods (information replicated from Table 9 of the Freshwater Assessment prepared by E3 Scientific)

Species	Spawning period
Clutha flathead galaxias	1 August to 15 November
Kōaro	1 April to 30 May
Longfin eel	Do not spawn within rivers
Upland bully	1 October to 31 December
Common Bully	1 August to 28 February
Brown trout	1 May to 30 June
Rainbow trout	1 June to 30 August

The Freshwater Assessment has determined the effects of the activity on fish spawning and migration to be 'low'.

Brown trout and rainbow trout are likely to spawn within the Clutha River / Mata-Au. The applicant proposes to undertake works during the sports fish spawning season. Initially the applicant had proposed to prepare the Annual Work Programme in consultation with Otago Fish and Game, to operate only in a single 1,500 m section of the riverbed during trout spawning season and to liaise with Otago Fish and Game to find a new mining location in the event that any sports fish redds⁴ be identified. It is understood that the applicant has since removed these conditions from the proposal.

⁴ A redd is 'where a fish has turned onto its side and used its tail to clear a spot in the gravel bottom to spawn. They are usually round or oval in shape and lighter in color than the surrounding bottom.' - <https://www.troutfitters.com/blog/post/where-and-how-to-spot-redds-from-spawning-fish-by-john-mcpherson>

With the inclusion of those conditions, the Freshwater Assessment considered that the effects on the spawning habitat of brown trout and rainbow trout are 'low'.

The Freshwater Assessment states that, while no lamprey have been recorded in this area, they are difficult to fish for and may be present. Their spawning habitat appears to be small, shady, hard bottomed streams, which (if present) would be in the side tributaries of the river where the applicant has proposed conditions to avoid these areas. Juvenile lamprey (ammocoetes) show a preference for sandy and shallow areas of rivers, which are inaccessible by the dredge. The Freshwater Assessment determines adverse effects on lamprey are 'low'.

Upland bully and common bully prefer gentle flowing stream margins, which are inaccessible by the dredge, and as such effects on their habitats are considered to be 'very low'. Longfin eels do not breed in the Clutha River / Mata-Au, but instead at sea, and the migration pathway of adult eels is considered unlikely to be affected by the dredge (effect is considered to be 'low'). Kōaro and Clutha flathead galaxias are unlikely to spawn in the Clutha River / Mata-Au as they prefer clear, swiftly flowing forested streams with vegetated riparian margins (effect is considered to be 'low').

Further to this, the applicant initially put forward a condition that requires that between the periods of 1 September and 31 January, they will only operate in two of the 1,500m sections of the river identified in the current annual work program and prepared in conjunction with the Department of Conservation; and between 1 April and 31 October (sports fishing season) they will only operate in a single 1,500 m section. It is understood that the applicant has since removed these conditions from the proposal.

Ms Coates did not raise any concerns with the E3 Scientific assessment of effects on fish spawning and migration, except to say the disturbance to eel migration may be too conservative.

As the applicant has proposed to remove some of the conditions initially proposed as part of the application and recommended by E3 Scientific for adverse effects to be 'low', it is unclear whether the assessment completed by E3 Scientific and reviewed by Ms Coates is still applicable. The applicant has requested that the application proceed to public notification as quickly as possible, so this has not been closed out prior to public notification, however clarification on the full set of conditions proposed by the applicant and an assessment by e3 Scientific as to whether their conclusions on the level of effect remain unchanged is sought from the applicant.

Due to this, I am not able to conclude the potential adverse effects of the proposal on fish spawning and migration at this time.

Entrainment of fish

The disturbance of the riverbed could result in the entrainment of fish species, which would pass through the sluicing equipment alongside the bed material. The Freshwater Assessment describes that the dredge nozzle is positioned near the gravels and then drives into the gravels, through the gravel-water interface where fish may reside. They stated that this may result in fish mortality, however considered that it is more likely that fish would pass through unharmed and be returned to the river with the tailings.

E3 Scientific are of the opinion that due to the location and depths within the river where the dredge is operating, the only species present are trout, which are more likely to move out of the way as they will detect the presence of the dredge before

being entrained. They have recommended that the dredge operator maintains a record of any fish observed to be entrained, and if the fish survives it be entered into the New Zealand Freshwater Fish Database. Overall, they considered the level of adverse effect from fish entrainment on aquatic ecology to be very low.

Further to this, Ms Coates recommended a condition that if any At Risk or Threatened Fish species are identified as having been entrained, the exclusion areas should be revisited and potentially extended. The applicant advised they were comfortable with this condition.

Ms Coates also recommended that any fish entrained are photographed, and the addition of a condition of consent requiring that if an 'At Risk' or 'Threatened' fish species is identified as having been entrained during the suction dredging activity, the exclusion areas should be able to be revisited and potential extended, or new exclusion areas created. The applicant has advised that the entrainment of fish has only been seen once, with what appeared to be a trout, and there is not time to determine the species, capture, photograph or determine whether the fish has survived. As such, they do not consider that this condition would be workable and based on this do not consider Ms Coates recommended condition should be required in this instance. Based on the applicant's response to this question, the earlier recommended conditions may also not be overly effective.

Regardless, due to the rarity of the applicant advising the entrainment of fish has occurred, I am comfortable that effects of the proposal on fish entrainment are less than minor.

Macrophyte disturbance

The management of aquatic pests is of paramount importance to protecting the freshwater environment. As described above, didymo and lagarosiphon are present in this area of the river. The Freshwater Assessment describes that didymo is already widespread, however lagarosiphon is not.

The applicant put forward a measure to minimise the spread of pest plants and aquatic weeds, including actions such as water blasting and cleaning machinery with appropriate chemicals before being brought to site, avoiding working in areas of Lagarosiphon, and avoiding the spread of didymo by ensuring appropriate cleaning if the dredge has been used in an area where didymo is known to be present, removal of vegetation caught on machinery and appropriate cleaning of all machinery prior to leaving the site.

The Freshwater Assessment concludes that, with the adherence to the proposed measures, the effects on macrophytes will be 'low'. Ms Coates did not raise any concerns with the E3 Scientific assessment of effects on macrophyte disturbance.

Overall, I concur with this assessment and consider that the adverse effects on macrophytes will be less than minor.

Slipway construction

The construction of slipways involves riverbed disturbance which can result in the loss of aquatic habitat and discharge of sediment during works.

The Freshwater Assessment describes that the slipway sites have been selected as they require minimal earthworks within the riparian margin and will not be within the

wetted bed of the river. It concludes that the effects of the proposed slipways on ecology values will be 'negligible'.

Ms Coates concurs with this assessment and has recommended that works are undertaken in accordance with an erosion and sediment control plan prepared by an appropriately qualified person.

The Freshwater Assessment highlights that there could be risk of erosion of the slipway during flood events. This is addressed in the section below relating to potential adverse effects on hazards.

I consider that any adverse effects of the proposed slipways on ecology values are less than minor.

6.5 Effects on indigenous birds

The natural ecosystem values of the Clutha River / Mata-Au are discussed in section 3 of this report, and it is identified that the Clutha River / Mata-Au between Alexandra and Lake Wanaka is home to a significant range of indigenous waterfowl.

The operation of the suction dredge (e.g., noise and presence) has the potential to disturb nesting birds and the discharge of sediment to water can adversely affect instream habitat by reducing the quality of the water.

The applicant has advised that there will be localised disturbances which may frustrate waterfowl, however anecdotally the operators of Cold Gold Clutha Limited have advised that waterfowl seem unflustered by the operation. I note that the overall extent of proposed suction dredging is large (approximately 22.7 kilometres), so any disturbance would be only in a small portion of the river at one time.

Aside from when it is being slipped, the dredge is constrained by the depth of the draft (0.8m), and mining only occurs in the wetted bed. As such, it will not disturb habitats (including nests) located in the margins or islands of the Clutha River / Mata-Au.

During slipping, as well as general suction dredging operations, the applicant has proposed the following:

- Heavy machinery shall not be used within 50m of nesting and roosting areas of the Black Fronted Tern, Black Billed Gull and Banded Dotterel between the dates of 1 September to 31 January (inclusive each year).
- Dredging and bed disturbance shall not occur within the roosting and nesting areas of the Black Fronted Tern, Black Billed Gull and Banded Dotterel at any time.
- The Queensberry slipway will not be constructed within 100 m of any nesting colonies. In the response to the request for further information the applicant requested this condition be removed with reference to Ms Coates assessment stating that it was not necessary, however the aspects of Ms Coates assessment referenced by the applicant related to avoidance of birds associated with suction dredging activities rather than the construction of the slipway. As such, it is considered that this condition still forms part of the proposal and confirmation of this will be sought from the applicant.

Ms Coates concurs with the assessment of effects on waterfowl. She agrees with the proposed condition that the Queensberry slipway is not constructed within 100 m of any existing nesting colonies however advises this condition is restricted only to indigenous bird species.

Based on the assessment by Ms Coates, I am comfortable that adverse effects of the proposal on waterfowl will be less than minor.

6.6 Effects on downstream water users

Surface water takes can restrict the availability of water for downstream users and the discharge of contaminants can affect the water quality available. As the proposed water take is non-consumptive, it will not have an adverse effect on the availability of water for other users. This is described in more detail in the assessment of allocation availability.

The proposal involves the discharge of sediment to water, with the applicant having requested allowance for a zone of reasonable mixing of 200 m from the discharge point. The applicant has advised that the plume will be narrow (rather than a wall of sediment), and due to this it is able to be 'directed'. In the context of the Clutha River / Mata-Au the adverse effects from the discharge are considered of limited scale and it is unlikely that it will adversely affect downstream water users.

Further, the applicant has proposed that there be no operation within 20m of a consented water take, and that the activity must not compromise the intake structure or quality of water taken up by any permitted or consented water takes. The applicant has advised that points of take on the Clutha River / Mata-Au are typically highly visible due to the presence of a submersible pump, piping or other infrastructure that extends out of the water and up the riverbank.

Overall, considering the characteristics of Clutha River/ Mata-Au and the proposed mitigation measures, I am comfortable that the adverse effects on downstream water users will be less than minor.

6.7 Effects on Recreation Values

The Clutha River / Mata-Au is a recreational resource for water sports activities, walking and cycling, camping and fishing. The presence of large structures, as well as associated effects including the discharge of sediment-laden water, can adversely affect the recreational values of a water body or restrict access to the water body.

Whilst a significant size, the dredge is a slow-moving vessel and is fully licensed by Maritime NZ. As described earlier, the anchors are in front of the vessel and well below water level, avoiding creating an impediment to other users. When the side lines are used, they are highlighted with marking tape and/or marker buoys. Due to the width of the Clutha River / Mata-Au and this anchoring system, substantial clear passage is provided down at least one side, and normally both sides, of the river for other users to pass. I note that there are other regulations that would apply here with respect to boat safety, including but not limited to the ORC Navigation Safety Bylaw 2020.

As described above, the proposal involves the discharge of sediment to water. Sediment is a contaminant that with respect to recreational activities will result in discolouration of the water and reduced water clarity. The applicant has requested allowance for a zone of reasonable mixing of 200m from the discharge point and described that the plume will be narrow (rather than a wall of sediment). In the context of the Clutha River / Mata-Au the discharge is considered limited in scale, and it is unlikely that it will adversely affect recreational water users.

Maritime New Zealand were contacted in relation to the application and no response was received.

A copy of the application was sent to the Harbour Master who advised that their navigational concerns have been addressed in the application. They raised some concern that recreational operators will not be aware of the operation in this area so will need some education and/or notification once the applicant commences operations. They also requested that the location of the bunded fuel tank is provided, once known, and the Pollution Hotline number (0800 800033) should be included in any emergency plans. I am comfortable these requests can be addressed through consent conditions, where appropriate.

The dredging operation will not restrict public access to the Clutha River / Mata-Au. There may be a short disruption to public access in a localised area associated with the construction of the slipways and slipping of the dredge, however any adverse effects associated with this will be less than minor and temporary.

Overall, it is considered that potential adverse effects on recreation values are likely to be less than minor.

6.8 Effects on archaeological and heritage values

Activities such as mining can affect nearby the heritage values or structures by physically damaging structures, undercutting foundations or reducing accessibility to those sites.

The registered historic places as identified in Schedule 1C are not within proximity of the proposed dredging operations, and as such any adverse effects on those historic places will be less than minor. With respect to those other archaeological sites as identified on ArchSite, they are considered likely to be located outside of the wetted bed, and therefore not impacted by the proposed dredging.

The application states that the upper Clutha River / Mata-Au experiences significant flood events, and any heritage features within the active bed are likely to have been affected by the flood flows. I agree with this statement and consider the potential risk of uncovering a heritage site within the riverbed to be low.

Regardless, to mitigate any remaining risk, the applicant has proposed the protocol to be followed in the event of an archaeological site being discovered. I consider this will sufficiently mitigate any adverse effects to be less than minor in terms of archaeology.

Regarding earthworks required for the construction of the slipway, the applicant has advised that these are located outside of the bed of the Clutha River / Mata-Au, and therefore are outside of the jurisdiction of Otago Regional Council. They will be assessed by CODC and CDC as part of their consenting process.

Overall, I am comfortable that the adverse effects on heritage values within the jurisdiction of ORC are less than minor.

6.9 Effects on Natural Character and Amenity

The presence of large structures in waterbodies can adversely affect the natural character and amenity values of the area.

Depending on the location of the dredge, it may be visible from State Highway 8 or any other road or properties adjacent to the river. The dredge is a mobile structure, meaning that any assessment of effects on natural character and amenity in one location are temporary. The applicant has advised that the dredge has been painted a sympathetic shade of green to blend in with the river and adjacent surrounds.

Mining occurs only in the wetted bed, thereby only disturbing bed material below the surface. As such, there will be no obvious change to the bed of the river as viewed in terms of natural character and amenity.

When operating during hours of darkness, deck flood lights are used for crew safety, and the requisite navigation lights are used. The application describes that *'whilst light spill is minimal, operating lights may or may not be visible from adjacent roadways or properties but are generally shrouded by riverbank foliage and river terraces'*.

The applicant has proposed that works are carried out only between the hours of 7 am and 10 pm to mitigate effects on natural character and amenity values.

It is noted that adverse effects arising from noise outside of the riverbed on the natural character and amenity of the area will be addressed by Ms Royce, as part of the district council consent applications. This is a cross boundary issue (noise created within an area under the jurisdiction of ORC is affecting people where effects are under the jurisdiction of the district council). As such, a consensus on these effects will need to be made.

In addition to this, and with reference to the historical association of gold mining and dredging in the Clutha River / Mata-Au, I consider that it is more in keeping with the natural character of the area at this location than it may be at other locations. Further, due to the mining permit process, the applicant describes that there will just be one dredge within this stretch of the river.

Overall, I have not drawn a conclusion on the potential adverse effects on natural character and amenity due to the cross-boundary nature of the generation of noise.

6.10 Effects on Hazards

During floods, the rate of flow and level of the Clutha River / Mata-Au can increase considerably which may affect the ability of vessels to make headway or remain stationary. The river can carry significant debris which can lodge against vessels and structures, increasing drag and the potential for damage. Rising floodwater can also reduce the viability of slipways for removing vessels. Further to this, works in the bed of the river such as the construction of a slipway or disturbance of the riverbed, can result in ongoing erosion, scour and destabilisation of the riverbank.

The applicant has advised that prior to the dredge commencing mining in an area, the skipper will evaluate where the dredge can manoeuvre to during high flow events. This forms part of the skipper's role on the dredge. These locations cannot specifically be identified as they will change depending on the location of works and the changeable state of the river. The applicant advises they have a positive relationship with Contact Energy, who carry out long-range hydrological modelling as part of the management of the river system and provide this information to the applicant to inform their operational safety.

To mitigate risks associated with high flows, the applicant has proposed that all measures will be taken to ensure that equipment is secured in high flows and flooding events to prevent any obstruction or blockage in the river channel. Mr Macdiarmid of

GeoSolve Limited reviewed the application on behalf of ORC and agreed that this measure appropriately mitigates the risks associated with flood events.

As described elsewhere in this report, the draft of the dredge is 0.8m, meaning dredging can only occur in the wetted bed and cannot extend into / under structures (unlike smaller dredging operations). As such, the dredging activity will not alter any dry bed or banks or increase risk of erosion and scour of the bed and banks of the Clutha River / Mata-Au. Further to this, the dredge immediately discharges gravels back to the riverbed, thereby not creating channels in the riverbed.

To mitigate the risk of erosion and scour from the suction dredging activities, the applicant has proposed the following measures:

- Upon completion of mining of each stage of the riverbed (being 1,500m length) the riverbed be remediated as far as practicable to its natural form and be consistent with the adjacent areas.
- Mining must not adversely affect any bridge foundation or intake structure.
- There must be no disturbance of vegetated areas adjoining the Clutha River / Mata-Au
- There must be no excavation or disturbance to any riverbanks except for providing access.
- The mining must not cause any flooding, erosion, scour, land instability or property damage.

Mr Macdiarmid advised that these conditions are appropriate. I am comfortable the proposed measures provide adequate protection of the riverbed and structures with respect to erosion and scour.

With respect to the construction of the slipway at Rongahere Road, the application was reviewed by Mr Macdiarmid. Mr Macdiarmid advised that he agreed with the conclusion of the Flood Sense Limited report, however added that reinstatement should be better defined stating that 'the reinstatement backfill should be compacted and the surface re-vegetated to match adjacent ground conditions, contour and cover'. He also recommends that ORC Engineering team should be consulted prior to works commencing. The applicant has agreed to this. Overall, I am comfortable the effects of the slipway construction at Rongahere Road on natural hazards are less than minor.

With respect to the construction of the slipway at Queensberry, whilst there is little information provided in the application, Mr Macdiarmid has advised that while the details will be different to the Rongahere Road slipway, the concept is similar. The slipway will not restrict flood capacity. Mr Macdiarmid has, however, advised that given it will remain open for several years his only concern would be if the slipway excavation encountered soils that were susceptible to erosion (e.g., silts). He considers this risk to be low and can be addressed by conditions including appropriate slipway reinstatement, slipway inspections, a maximum gradient and temporary erosion protection if silt is encountered. The applicant has agreed to these conditions. Overall, I am comfortable the effects of the slipway construction at Queensberry on natural hazards are less than minor.

There are no known defences against water (e.g. flood protection or engineering measures) within the extent or location of the proposed works. Mr Macdiarmid advised that regardless of this, the ORC Engineering team should be consulted regarding the construction of the slipway prior to works commencing and works should be completed to the satisfaction of the ORC Engineering team. The applicant has agreed to this.

The applicant has proposed the following measures relating to mitigating adverse effects on transmission lines:

- The total height of the dredge does not exceed 7.5m vertical from the water line.
- The dredge must not come within 15m of any high voltage line
- Vessels performing work under other electricity lines must maintain a 4m minimum approach distances.

According to the Transpower Assets Map⁵, there are no High Voltage Transmission Lines within the extent of the proposed dredging activities. There may, however, be lower voltage electricity lines within the extent of the proposed dredging. I consider the proposed mitigation measures will result in less than minor adverse effects on hazards.

Overall, due to the mitigation measures put forward by the applicant and the advice of Mr Macdiarmid, I consider that the adverse effects on hazards are likely to be less than minor.

6.11 Effects on Cultural Values

As described earlier, the Clutha River / Mata-Au at this location is identified in Schedule 1D of the RPW as having a wide range of values to Kāi Tahu and is the subject of a statutory acknowledgement under the Ngāi Tahu Claims Settlement Act 1998.

At the time of application, the applicant advised that the only feedback received had been from Hokonui Runaka, who advised that in the first instance they will oppose all instream gold dredging applications.

Further information on effects on cultural values was sought in the section 92 request (question 15), in the form of a Cultural Impact Assessment, Cultural Values Assessment or other documentation as determined appropriate by Aukaha, Te Ao Marama Incorporated and Te Rūnanga o Ngāi Tahu.

The applicant commissioned a Cultural Impact Assessment (CIA) from Aukaha. The values of the environment as described in the CIA have been presented in section 3 above. The CIA describes that mana whenua have undertaken a robust process to define Te Mana o te Wai in Otago, with it being framed by their vision for freshwater and aligning with the central elements of their creation traditions and informed by knowledge and mātauraka about te taiao and wai Māori.

Section 8 of the CIA presents the assessment of potential effects of the proposal on cultural values. To summarise:

Wāhi Tūpuna and Ara Tawhito values

Mana whenua aspirations and intentions for the Clutha River / Mata-Au include recognition of wāhi tūpuna and ara tawhito (and values associated with them), recommencing whanau to the awa and enabling access to, and use of, wāhi tūpuna and nohoaka sites.

The CIA advises that there is not adequate information to explain how impacts on wāhi tūpuna and ara tawhito values will be mitigated. It describes that the Clutha River

⁵ Transpower Assets Map - <https://data-transpower.opendata.arcgis.com/>

/ Mata-Au has been significantly modified and degraded by mining and dredging in the past and further modification is not supported by mana whenua.

Wai Māori values

The CIA describes that the trends shown in the Clutha River / Mata-Au for clarity and turbidity are of concern to mana whenua, given the nature of the proposed dredging activity. They describe that the application concludes that there will be no discernible adverse effects on water quality beyond the zone of reasonable mixing with no supporting evidence and that no monitoring is proposed to manage effects on water quality. As such, they describe that mana whenua are unable to assess whether the activity provides for the mauri of the Clutha River / Mata-Au and gives effect to Te Mana o te Wai.

As described earlier, the applicant has provided an assessment of effects on water quality at the zone of reasonable mixing and has proposed conditions for monitoring (although it is not clear which conditions form part of the application).

Ecological and biodiversity values

The CIA advises that modification of the awa, as well as changes in land use practices and introduction of exotic species, has contributed to the disconnection between whanau and the awa. Consequently, the restoration of habitats for mahika kai species and the reinvigoration of indigenous biodiversity is a significant aspiration for Kā Rūnaka.

The CIA highlights three areas where Aukaha do not consider there is sufficient information to address potential effects. The applicant commissioned E3 Scientific to respond to these points, so the concern raised in the CIA and response from E3 Scientific are provided below. The applicant has provided the E3 Scientific response to Aukaha, however no response has been received from Aukaha to date.

The CIA highlights that the Freshwater Assessment by E3 Scientific only included macroinvertebrate sampling in three locations in Central Otago district, with none in Queenstown Lakes District, and that all samples were taken from wadeable depths rather than depth at which dredging will occur. They consider this raises the question as to whether the Freshwater Assessment is fit for purpose. E3 Scientific advised that the section of river within Queenstown Lakes is similar in terms of nutrient inputs and sediment and as such considers that ecological assessment to be appropriate. I also asked this question to Ms Coates during her review of the application. She advised macroinvertebrate sampling in a river this size is difficult and as samples can only be taken from shallower edges a complete picture of macroinvertebrate community cannot be gathered, however she considered that additional sampling would provide little extra valuable information.

The CIA considers that disturbance of the bed should be avoided in the vicinity of all tributaries, not just those wider than 1m. E3 Scientific advise it would be best to map and confirm agreed tributary exclusion zones during the consenting process.

Aukaha believe there is insufficient information on the effects of dredging on instream benthic environments and therefore on taoka species and their survival, with greatest concern being effects on sediment dwelling species such as ammocoetes, eggs of kanakana, bully and galaxiids species, and juvenile kōura and tuna. E3 Scientific agreed that little is known on the effects of suction dredge mining on freshwater ecology values in New Zealand. They consider it is very unlikely that lamprey (kanakana) will be present in this section of the Clutha River and ammocoetes

prefer very slow flowing edge and backwater habitat. The stretch of river identified for dredging is identified as spawning habitat for brown trout and rainbow trout only.

The CIA also highlights that the application concludes that any elvers or mature eel drawn through the dredge would survive unharmed and that the impact to the tuna population would be inconsequential, however they do not consider this is supported by evidence. E3 Scientific has advised that adult eels would avoid the suction dredge operation because they travel mostly at night and along riverbank edges. They advise that elvers could bury themselves in the mid-river substrates during the day and on their migration would actively avoid the operations sound and sediment plume and therefore be very unlikely to be entrained by the dredge.

Archaeological values

The CIA states that the application has not addressed Māori archaeology values and the adoption of an accidental discovery protocol may not be sufficient to identify and protect Māori archaeological sites. The CIA does not provide any further advice as to how potential effects on Māori archaeological sites could be managed.

Equity of environmental outcomes

The CIA describes that there has been significant loss of mahika kai and taoka species and modification of wāhi tūpuna with consequential impacts on Kāi Tahu communities, and that the proposal perpetuates a pattern of extractive use of the Clutha River / Mata-Au. They describe that the application does not propose environmental mitigation to off-set the effects of the proposal and that it is focused on economic use to the detriment of environmental outcomes.

The CIA also describes in the conclusion section (section 9) that Hokonui Rūnanga have taken a firm stance of opposing suction dredge mining due to unknown effects on benthic species including ammocoetes, kākahi, eggs of multiple fish species and migrating elver; and that an Ecological Management Plan should be prepared by a suitably qualified freshwater ecologist, form part of the application and be reviewed annually. The potential effects on benthic species have been addressed by E3 Scientific above, and E3 Scientific state that an Ecological Management Plan could be prepared however it would be as a condition of consent and not form part of the application.

As described above, the applicant has provided the E3 Scientific response to Aukaha for review. I recommend the applicant continues to engage with Aukaha to discuss how potential adverse effects on cultural values could be mitigated, prior to the application reaching a hearing.

It is not clear whether the applicant has engaged with Te Ao Marama Incorporated, who represent rūnaka whose takiwa extends to the Clutha River / Mata-Au or Te Rūnanga o Ngāi Tahu with respect to the statutory acknowledgement. The application will be directly notified to Te Ao Marama Incorporated and Te Rūnanga o Ngāi Tahu, and they will have an opportunity to submit on the proposal.

I am of the opinion that further assessment of these values will be required prior to taking the application to a hearing. This could be through submission points should the rūnaka choose to submit.

6.12 Consideration of Alternative Methods

The applicant has not considered alternative methods.

7. Notification and Written Approvals

7.1 Section 95A Public Notification

Step 1: Is public notification mandatory as per questions (a) – (c) below?

(a) Has the applicant requested that the application be publicly notified? **Yes**

Given the applicant has requested public notification under section 95A(3)(a), I have not worked through the notification steps any further.

In addition to public notification, it is considered appropriate to advise the following parties that public notification of this application has occurred:

- Ngāi Tahu Group Management Ltd
- Aukaha
- Te Ao Marama Inc
- South Otago Ngāi Tahu Runanga Inc
- Hokonui Rūnaka (directly, due to their response to the application)
- Dunbrook Dairy Limited, landowner of Section 55 and Section 59 Block I Crookston Survey District
- Hawea Motors Limited, landowner of Lot 1 DP 466676
- Department of Conservation
- Otago Conservation Board
- Land Information New Zealand
- Otago Fish and Game Council
- Forest and Bird Branch
- South Island Eel Management Committee
- Central Otago District Council
- Queenstown Lakes District Council
- Clutha District Council
- ORC Natural Hazards Unit
- ORC Harbour Master
- Heritage New Zealand Pouhere Taonga
- Maritime Safety Inspector
- Transpower
- Contact Energy
- Aurora Energy
- Waka Kotahi

If Notification or limited notification is required then has the applicant paid the additional notification fee? Yes

7.2 Other Notifications

Maritime New Zealand (MNZ) was sent a copy of the application as the proposed activity fell within the criteria outlined in Section 89A of the Act. MNZ did not comment within 15 working days, therefore the application proceeded.

7. NOTIFICATION RECOMMENDATION:

The applicant has requested that the application be processed on a publicly notified basis and has advised they wish to proceed with public notification as quickly as possible.

As described in section 6, there are effects which have not been addressed in full meaning I am currently unable to be confident that the adverse effects of the proposal

as they relate to cultural values, natural character and amenity, and aquatic ecology will be less than minor. As such, I have been unable to make a determination regarding public notification under section 95A. Ideally these matters would have been closed out prior to public notification, however this is not a requirement (per section 95C) and the applicant has indicated a desire to proceed with public notification as soon as possible.

As such, it is recommended that the application proceed on a **publicly notified** basis.

Name: Josie Burrows

Title: Consultant Planner to Otago Regional Council

Date: 05/05/2023

Signature:

J Burrows

Decision on notification

Sections 95A to 95G of the Resource Management Act 1991

Date: 16 May 2023

Application No: RM22.434

Subject: *Decision on notification of resource consent application under delegated authority*

Decision under Delegated Authority

The Otago Regional Council decides that this resource consent application is to be processed on a **publicly notified / limited notified / non-notified**⁶ basis in accordance with sections 95A to 95G of the Resource Management Act 1991.

The above decision adopts the recommendations and reasons outlined in the Notification Recommendation Report above in relation to this application. I have considered the information provided, reasons and recommendations in the above report. I agree with those reasons and adopt them.

This decision is made under delegated authority by:



.....
Peter Christophers
Acting Team Leader Consents Coastal

16 May 2023

⁶ Once all identified affected parties have provided their unconditional written approval to the application. If these approvals are not provided then the application will proceed by limited notification.