

# 2

## Application To Dam Water



This form is to be used for applications seeking to dam water within a watercourse, or outside a watercourse where natural runoff will be captured.

(For Office Use Only)

Consent No.: \_\_\_\_\_

Job No: \_\_\_\_\_

### PLEASE READ THIS PAGE BEFORE COMPLETING THE APPLICATION FORM

A number of resource consents may be required for the construction of a dam and the impoundment of water behind it. This schedule addresses the requirements for a water permit to dam water only.

Depending on the location of your dam structure, and if the dam structure is existing or new, you may not need to fill out all parts of this schedule.

Please note that additional permits may be required when damming water. These include:

- a water permit to take surface water or groundwater, should the dam impound water for which no consent is held to be taken (see Schedule 4 or 5), and
- a water permit to divert water, if flows are to be diverted during construction (see Schedule 3).
- a discharge permit to discharge water from a dam (see Schedule 7),
- a land use consent to disturb the bed of a watercourse and erect a dam structure in the bed of a watercourse, should construction activities occur in the bed of a watercourse (see Schedule 10C), and
- a discharge permit to discharge contaminants to water during dam construction (see Schedule 7) and
- a building consent for the dam structure *Please note that dam structures and dam modifications require a building consent under the Building Act (2004). The Otago Regional Council currently issue building consents for dams. You will need to apply to Council directly for a building consent. Application Forms are available on our website under „Dams, their safety and building consents“*

In order for any consent application to be processed efficiently in the minimum time and at minimum cost, it is critical that as much relevant information as possible is included with the application.

Form 1 and Schedule 2, when properly completed, may provide an adequate “Assessment of Effects on the Environment” (AEE) where the adverse effects of the dam proposal are not significant. The required detail for an AEE should reflect the scale and significance of the potential adverse effects the proposed dam may have on the environment. If the size of the proposed dam or scale of its potential effects is significant, a report by a professional advisor in support of your application may be required.

Guidance to answering the questions appear at the end of this schedule: “Notes to provide Guidance on Completing Schedule 2”. Details of the information required in an AEE are included in the Fourth Schedule of the Resource Management Act 1991 appended to Form 1: Resource Consent Application.

**If all the necessary information is not supplied with the application then Otago Regional Council may return your application, request further information or decline your application. This will lead to delays in the processing of your application and may increase processing costs.**

If the effects of your proposal are considered to be minor and written approvals are gained from all parties that may be adversely affected by it, then your application(s) will proceed under non-notified consent provisions. If you are unable to supply the necessary written approvals from the affected parties, or if the effects of the proposal are more than minor, then Council must limited notify or fully notify the application. Such applications take longer to be processed than non-notified applications and may incur additional processing costs. Details of consultation required are presented in this document.

## **PART A: Description of the Proposed Damming and Associated Activities**

### **A.1 Is the application to dam water:**

- a new consent, or  
 to replace an existing consent? \_\_\_\_\_ (consent number)

### **A.2 Please Indicate what provisions of Permitted Activity Rule 12.3.2.1 of the Regional Plan: Water for Otago, cannot be met by the proposed damming activity:**

- The size of the catchment upstream of the dam is greater than 50 hectares in area.  
*Size of catchment upstream of dam:* \_\_\_\_\_

- The water immediately upstream of the dam is more than 3 metres deep.  
*Maximum water depth behind dam:* \_\_\_\_\_

See attached  
AEE

- The volume stored by the dam is more than 20,000 cubic metres.  
*Maximum volume able to be stored behind dam:* \_\_\_\_\_

- A lawful take will be adversely affected by the dam.  
*Name whose take will be affected, and water permit number if known:* \_\_\_\_\_

- A wetland identified in schedule 9 of the Regional Plan: Water or any wetland higher than 800 metres above sea level will be adversely affected by the dam.  
*please name/describe wetland:* \_\_\_\_\_

- The dam will cause either flooding, erosion, land instability, sedimentation or damage of another person's property.  
*Name which effect above, and whose property (if relevant):* \_\_\_\_\_

### **A.3 Purpose for damming water: (Tick as appropriate)**

- Irrigation  
 Water harvesting / storage  
 Stock water  
 Domestic water supply  
 Stormwater treatment  
 Hydro-electric power generation  
 Ornamental (specify): \_\_\_\_\_  
 Other (specify): \_\_\_\_\_

### **A.4 Other Resource Consents required**

#### **A.4.1 (a) Do you hold a water permit or deemed permit / mining privilege to take the water that is dammed?**

- Yes (permit number): WR3908CR & WR1233CR (go to Question A.4.2)  
 No (go to question A.4.1(b))  
 Not applicable (specify why): \_\_\_\_\_

(b) Do you comply with the Permitted Activity Rules 12.1.2 or 12.2.2 of the Regional Plan: Water?

Yes (no resource consent to take water is required)

No (a water permit may be required, see Schedule 4 or 5)

A.4.2 (a) Do you intend on discharging water from the dam into water (i.e. not to a pipe or race, but into a natural watercourse).

Yes (please specify how): see AEE (go to Question A.4.2(b))

No (go to Question A.4.3)

Not applicable (specify why): \_\_\_\_\_

(b) Do you hold a Discharge Permit to discharge water to water from the dam?

Yes (permit number): \_\_\_\_\_ (go to Question A.4.3)

No (go to Question A.4.3)

A.4.3 (a) Do you propose to construct a new dam in a watercourse?

Yes (go to Question A.4.3(b))

No (go to Part B)

(b) For the associated bed disturbance, if consent to dam water is needed you will be unable to comply with the Permitted Activity Rules given in Section 13.5.1 of the Regional Plan: Water. As such a land use consent is required, please fill out Schedule 10C. For the associated discharge of contaminants (sediments, concrete, etc) during bed disturbance, a discharge permit is required, please fill out Schedule 7).

Please tick if Schedule 10C attached

Please tick if Schedule 7 attached

(c) For the erection/placement/alteration of the proposed dam structure within the bed of a lake or river, if consent to dam water is needed you will be unable to comply with the Permitted Activity Rules given in Section 13.2.1 and 13.3.1 of the Regional Plan: Water, and a land use consent is required, please fill out Schedule 10C).

Please tick if Schedule 10C attached

(d) If you propose to divert the flow of the watercourse to construct a dam, are you able to comply with the Permitted Activity Rules given in Section 12.3.2 of the Regional Plan: Water?

Yes (no resource consent to divert water is required)

No (a water permit for the diversion is required, see Schedule 3)

## **PART B: Location of the Proposed Activity**

B.1 Describe the property on which the proposed dam structure is to be located (if the dam is located on Crown Riverbed, please note on (e) below) [See original \(Feb 2020\) AEE](#)

(a) Full name(s) of owner(s) \_\_\_\_\_

(b) Full name(s) of occupier(s) \_\_\_\_\_

(c) Address/Location \_\_\_\_\_  
\_\_\_\_\_

(d) Legal Description(s) *(as shown on Certificate of Title)*

Lot \_\_\_\_\_ DP \_\_\_\_\_ Sec \_\_\_\_\_

Survey District (SD) \_\_\_\_\_

Area (Nearby town etc.) \_\_\_\_\_

Other (specify) \_\_\_\_\_

Council will obtain a Certificate of Title to confirm details, if necessary.

(e) Is the dam located on Crown Riverbed: Yes:  No:

If Yes, give the legal description of the property adjacent to the point of take

\_\_\_\_\_

**B.2 If land is to be inundated as a result of the proposed dam structure, please describe the property(s) to be inundated**

(a) Full name(s) of owner(s) \_\_\_\_\_

(b) Full name(s) of occupier(s) \_\_\_\_\_

(c) Address/Location \_\_\_\_\_  
\_\_\_\_\_

(d) Legal Description(s) *(as shown on Certificate of Title)*

Lot \_\_\_\_\_ DP \_\_\_\_\_ Sec \_\_\_\_\_

Survey District (SD) \_\_\_\_\_

Area (Nearby town etc.) \_\_\_\_\_

Other (specify) \_\_\_\_\_

**B.3 Map reference of the proposed dam structure in NZTM 2000:**

NZTM 2000: E \_\_\_\_\_ N \_\_\_\_\_

[See AEE](#)

**B.4 If your proposed dam to be located within a watercourse, please provide the name of the watercourse:**

\_\_\_\_\_

*(If the water body is unnamed then note this and give the name of the water body to which it flows into)*

**B.5 Please provide a plan (A4 or A3 size) with this application that shows the following:**

(a) The location of the proposed dam.

(b) Natural ground contours.

(c) The pattern of land inundation that will occur when the proposed dam is full.

(d) The legal boundaries of all property(s) that will be affected by the proposal, including the names of the owners and/or occupiers of those properties.

[See AEE](#)

- (e) The location of any spillway or overflow.
- (f) The flow-path of any watercourse(s) (*please indicate the direction of flow with an arrow*).
- (g) Any other relevant features that will allow identification of the location of the dam, such as roads, bridges, dwellings, historic or waahi tapu sites, or other landmarks.
- (h) Overflow / flood paths (*include buildings and infrastructure that may be within the flood path*).
- (i) Any upstream or downstream water users (*include name(s) and distance(s) if known*).
- (j) A north symbol; and
- (k) A scale

**PART C: Description of the Water Resource/Catchment**

**C.1 If the proposed dam is located in a watercourse:**

(a) Is the watercourse:

Perennial (flows all year round) :

Ephemeral (flows intermittently or when there is rain) :

(b) Mean flow of watercourse (*if known*): \_\_\_\_\_ (l/s or m<sup>3</sup>/s)

(c) Mean annual low flow of watercourse (MALF) (*if known*): \_\_\_\_\_ (l/s or m<sup>3</sup>/s)

(d) Describe frequency and duration of flows if ephemeral (*if known*) \_\_\_\_\_

\_\_\_\_\_

(e) Flow for 50 year return period flood (*if known*) \_\_\_\_\_ (l/s or m<sup>3</sup>/s)

(f) Flow for 100 year return period flood (*if known*) \_\_\_\_\_ (l/s or m<sup>3</sup>/s)

(g) Flow for 100 year plus/super design event (*if known*) \_\_\_\_\_ (l/s or m<sup>3</sup>/s)

(h) Please describe the gradient of the watercourse or land on which the dam is to be located: \_\_\_\_\_

\_\_\_\_\_

(i) Please describe composition of the bed of the watercourse on which the dam is to be located: \_\_\_\_\_

\_\_\_\_\_

(j) Please describe any aquatic life present in the watercourse (i.e. fish, invertebrates, aquatic vegetation and riparian vegetation):

\_\_\_\_\_

\_\_\_\_\_

(k) Aquatic waterfowl associated with the watercourse?

\_\_\_\_\_

\_\_\_\_\_

**C.2 If the proposed dam is located outside of a watercourse:**

(a) Does the dam receive any natural runoff from the surrounding catchment?

Yes (please describe): \_\_\_\_\_



No

(b) What is the surrounding land used for immediately downstream of the proposed dam? *(please ensure that land use downstream is described to a distance appropriate to the scale of possible downstream effects in the event of dam failure)*

[See AEE](#)

**C.3 Have you identified any fault zones, flood zones, landslip areas or other flood hazards that may impact on the dam structure?**



Yes (please describe):

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No

**PART D: Dam Design Details**

**D.1 Design and Construction Methodology**

(a) Have you employed a professional advisor to design the dam?



Yes (give details):



No

(b) Have the New Zealand Society on Large Dams (NZSOLD) Guidelines (2000) been considered for this dam?



Yes



No (describe why not): [Not a large dam under the Building Act](#)

(c) What is the estimated start date of dam construction: [Already completed - see AEE](#)

(d) What is the estimated completion date of dam construction:

(e) When will initial filling of the reservoir commence:

(f) When will initial filling of the reservoir finish:

(g) Give a description of site conditions and construction methodology, including (but not limited to)

- Foundation conditions, including any bore logs, results of shear strength testing etc.
- Excavation and key requirements
- Compaction requirements
- Proposed construction

*(please note that for all larger dams of greater than "low" risk (as defined by NZSOLD), a professional engineering report will be required):*

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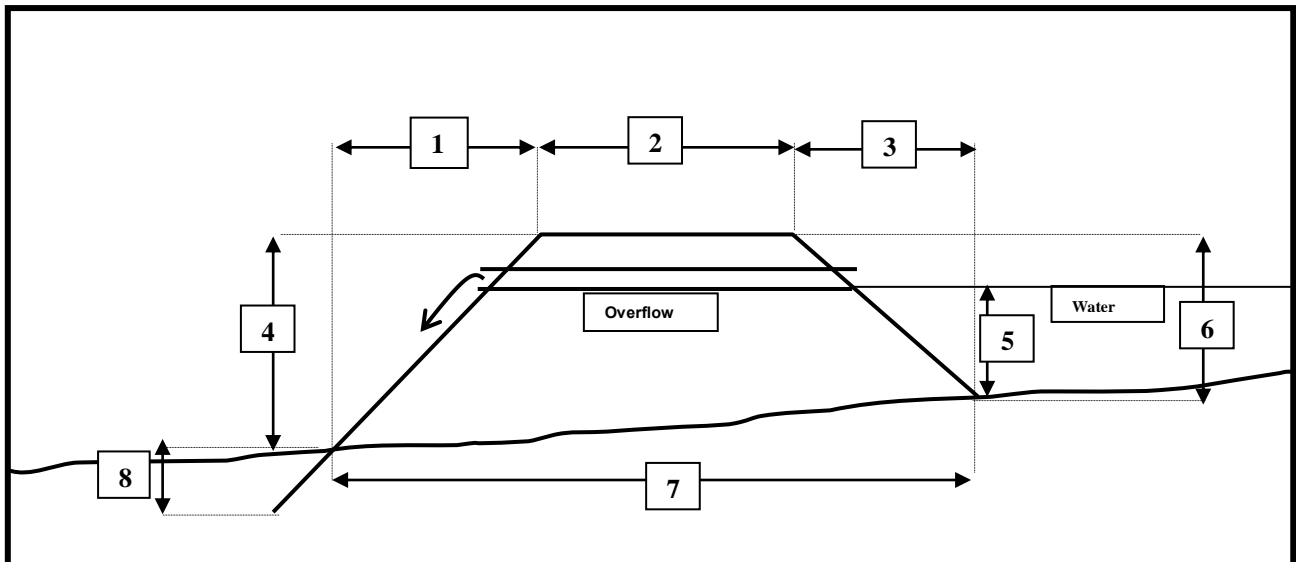
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(h) Please enclose labelled photographs of the site with this application, including

- (i) Proposed dam site, or
- (ii) If an existing structure, the upstream batter, downstream batter, abutments, spillway, outflow pipe, dam crest, overflow path; and
- (iii) View upstream of the dam site
- (iv) View downstream of the dam site
- (v) Other (anything else of relevance)

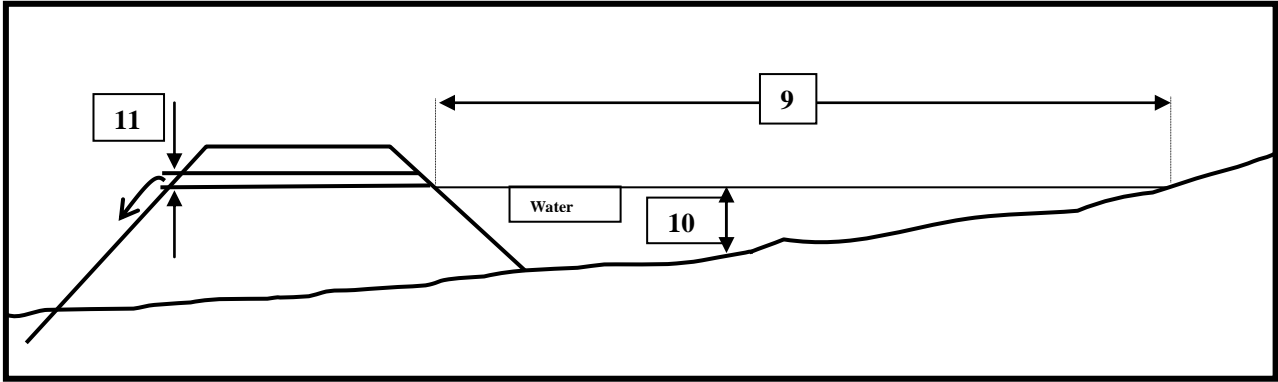
## D.2 Dam Design and Dimensions

D.2.1 Please fill in the dimensions shown on the diagrams in the lists below (if the dam design is different from that shown below, please include a diagram showing all dimensions).



- 1. Downstream batter width \_\_\_\_\_ m
- 2. Crest width \_\_\_\_\_ m
- 3. Upstream batter \_\_\_\_\_ m
- 4. Downstream batter height \_\_\_\_\_ m
- 5. Overflow pipe height or spillway crest \_\_\_\_\_ m
- 6. Upstream batter height \_\_\_\_\_ m
- 7. Dam base width \_\_\_\_\_ m
- 8. Depth dam is to be keyed into existing ground \_\_\_\_\_ m

See AEE



9. Length of pond behind dam \_\_\_\_\_ m
10. Maximum depth of reservoir \_\_\_\_\_ m
11. Diameter of overflow pipe \_\_\_\_\_ m

Other dimensions not shown on diagrams

12. Crest length: \_\_\_\_\_ m
13. Spillway width: \_\_\_\_\_ m
14. Spillway depth: \_\_\_\_\_ m
15. Spillway inlet height: \_\_\_\_\_ m
16. Spillway gradient: \_\_\_\_\_
17. Spillway surface material: \_\_\_\_\_
18. Material used for erosion protection of dam faces: \_\_\_\_\_

See AEE

19. Surface area of reservoir behind dam (when water level at overflow pipe or spillway level):
- Normal level \_\_\_\_\_ m
- Low level \_\_\_\_\_ m
- Flood level \_\_\_\_\_ m
20. Volume of water retained by dam (when water level at overflow pipe or spillway level):
- Normal level \_\_\_\_\_ m
- Low level \_\_\_\_\_ m
- Flood level \_\_\_\_\_ m

21. Describe in detail the junction between the shoulders and the dam: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**D.2.2.** What material/materials is the dam made out of (or to be made of)?

\_\_\_\_\_

\_\_\_\_\_



**D.2.3.** What are the design flow capacities of the spillway?

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**D.2.4.** Details of any proposed or current mitigation measures, including low flow outlets/bypasses and fish passes:

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**D.2.5** For dams for the creation of stormwater treatment ponds, please provide details of the ways in which the dam will be operated to allow for appropriate stormwater detention or treatment.

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**D.2.6.** Supply accurate design drawings of the dam, including:

- Profile / elevation showing embankment cross section, design of foundations / key, conduits and drainage, service outlet and flood spillway design, and erosion protection.
- Location and design of any proposed mitigation measures, including low flow outlets / bypasses and fish passes.

### D.3 Dam Safety

**D.3.1** What is the potential hazard category for the dam in accordance with the NZSOLD Guidelines 2000?

- High potential impact structure
- Medium potential impact structure
- Low potential impact structure
- Very low potential impact structure

See AEE

**D.3.2** What is the design life of the dam:

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**D.3.3** What maximum flood event is the dam designed to pass? N/A as out of channel

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*(note that all dams should be able to pass a probable maximum flood (PMF) event)*

Estimated flow rate of design flood event: \_\_\_\_\_ m<sup>3</sup>/s

Any other comments: \_\_\_\_\_

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**D.3.4** Will the public and/or stock be prevented from accessing the dam structure and its banks?



Yes (please describe): Dam is fenced and no public access

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No (detail why): \_\_\_\_\_

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**D.3.5** Will a Dam Safety Review, in accordance with the NZSOLD Guidelines (2000) be undertaken for the dam at regular intervals?



Yes (please describe, including frequency of review, or the circumstances when review will be initiated, and how the review will occur): \_\_\_\_\_

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No (detail why): Not a large dam, low PIC

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**D.3.6** Has an Emergency Action Plan been prepared for the dam, in accordance with the NZSOLD Guidelines (2000)?



Yes (please attach a copy to the application)



No (detail why): \_\_\_\_\_

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**D.4 Dam Operation and Management (*applicable to dams with a risk greater than “low”, as defined by NZSOLD*)**

Describe the operating regime of the dam on a separate page (or include an up-to-date copy of your operations and maintenance manual), including:

- Management of water levels.
- Management of discharges, including low flows/flow releases and flows over fish passes.
- If the dam will be used for water supply, demonstrate that the dam will provide sufficient storage to meet the projected demand, whilst providing for any proposed flow discharges.
- Maintenance and inspection of the dam embankment and spillways.
- Maintenance of reservoir including water quality control and removal of sediment and aquatic vegetation.

**D.5 Dam Break Risk Assessment**

**D.5.1** Please provide a risk assessment report on downstream impacts in the event of dam failure. This report should be prepared by a suitably qualified person, such as an engineer. For dams with a risk greater than “low”, inundation maps should be supplied. Please ensure that the location of any dams or infrastructure is shown.

**D.5.2** Do you propose to hold public liability insurance for the dam in event of dam failure?

Yes (please describe, including to what value the insurance is held for): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

No (please describe why not): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PART E: Assessment of Environmental Effects of the Proposed Dam**

An assessment of effects should be proportional to the scale and significance of the proposed activity. Where your proposed take could have a significant effect on water body flow or levels a detailed environmental assessment is required.

**E.1 Effects of the proposed damming of water on the surface water resource:**

(a) Please list any known water users that your proposed dam may affect: \_\_\_\_\_

(b) Will the damming of water have an effect on water availability to neighbouring properties?

Yes       No       Unknown

If yes, please explain the effect

\_\_\_\_\_  
\_\_\_\_\_

(c) Are there any of the following present within 500 metres of the proposed dam:

- |  |                              |  |                                  |
|--|------------------------------|--|----------------------------------|
| (i) Obvious signs or known aquatic biota?                        | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Unknown |
| (ii) Areas where food is gathered from the water body?           | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Unknown |
| (iii) Natural Wetlands?  | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Unknown |
| (iv) Waste discharges (e.g., dairy sheds, industrial, sewage)?   | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Unknown |
| (v) Recreational activities (e.g., swimming, fishing, canoeing)? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Unknown |
| (vi) Areas of special aesthetic value (e.g. waterfalls)?         | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Unknown |
| (vii) Areas or aspects of significance to lwi?                   | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Unknown |
| (viii) Other water takes?  | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Unknown |

If you have answered "Yes" to any of the above, describe what adverse effects your dam may have and the steps you propose to take to minimise (i.e. mitigate) these effects:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**E.2 Will the proposed damming of water affect any other individuals or organisations that may have an interest in that water?**

- |                                      |                              |                             |  |
|--------------------------------------|------------------------------|-----------------------------|--|
| (a) Other water users                | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Not Applicable |
| (b) Recreational water users         | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Not Applicable |
| (c) Fish and Game Council            | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Not Applicable |
| (d) Iwi                              | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Not Applicable |
| (e) Neighbouring landowners          | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Not Applicable |
| (f) Department of Conservation       | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Not Applicable |
| (g) Other (e.g. Forest & Bird, LINZ) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> Not Applicable |

If you have answered “yes” to any of the above, please explain how they may be affected by your proposed dam:

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If you have answered “no” to any of the above, please explain why they will not be affected by your proposed dam:

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\*If you have answered “yes” to any of the above, you may need that individual or organisation’s written approval for your application to proceed under non-notified consent procedures. This is discussed further in Part G.

**E.3 What are the positive effects of your proposed dam?**

[See AEE](#)

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**E.4 What monitoring, if any, do you propose to carry out to measure any effects of your proposed dam on the environment?**

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**E.5 Please tick if you are adopting any of the following measures to ensure that any adverse effects will be avoided, remedied or mitigated:**

- Release of flushing flows
- Flood attenuation
- Provision of passage for migratory fish i.e. fish pass, diversion, climbing surface.
- Wetland creation
- Fencing of reservoir and riparian planting around the edges of the reservoir
- Other (Please specify) \_\_\_\_\_

Explanation:

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## **PART F: Alternative Locations and Methods**

**F.1 Does your property have alternative locations for the dam (such as off stream locations, or stream of lower environmental value).**



No



Yes (please detail why your chosen location is considered the best option for you)

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## **PART G: Consultation**

**G.1 Please comment on any consultation undertaken with those persons/parties who may be interested in or potentially affected by your proposal to dam water (e.g., other water users, Department of Conservation, Fish and Game Council, Iwi, Transit New Zealand etc).**

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**F.2 Please provide any written approvals to the activity using Council's standard Form 1 - Resource Consent Application**

## **PART H: Is Your Application Complete?**

**H.1 In order to provide a complete application have you remembered to:**

- (a) Fully complete this schedule and Form 1 (Resource Consent Application)
- (b) Include a location / site plan?
- (c) Include photographs of the proposed/existing dam structure?
- (d) Enclose a Certificate of Title? **Provided in original AEE**



- (e) Attach any appropriate additional information?
- Including:
- (i) An emergency action plan?
- (ii) The dam maintenance and operations manual?
- (f) Complete and attach any additional schedules for associated resource consents?
- Schedule 3 (to divert water)
- Schedule 4 or 5 (to take surface water or groundwater)
- Schedule 7 (to discharge contaminants or water to water)
- Schedule 10C (to disturb the bed of a watercourse and erect a structure)
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## Notes to provide guidance on completing Schedule 2

### **Part A: Description of the Proposed Damming and Associated Activities**

#### **Question A.1**

If you are unsure whether there is an existing or expired resource consent check with Otago Regional Council. If you know your expiring consent number, or if you are applying to transfer your currently consented dam to another location, please supply the consent number.

#### **Question A.2**

The purpose of this question is to determine why the application for consent is required. Section 12.3 of the Regional Plan: Water for Otago outlines the rules relating to the damming of water. Please tick the relevant boxes and refer to the full Permitted Activity Rule 12.3.2.1 in the Regional Plan: Water for a full description of the Rule. Maps identifying wetland areas are identified on Map series F of the Regional Plan: Water for Otago. Please contact Council if you require any assistance.

#### **Question A.3**

Tick the boxes that indicate the purpose of your proposed dam.

#### **Question A.4**

Additional consents may be required from Council in relation to the damming of surface water depending on the nature of the proposal. These include permits for works in the bed of a river, the discharge of water to water and for the taking of surface water. Staff at the Otago Regional Council will be able to advise you whether your proposal meets the conditions of the Permitted Activity Rules or whether any additional consents are required.

### **Part B: Location of the Proposed Activity**

#### **Questions B.1 and B.2**

Please provide the name and address of the owner and occupier (if different to landowner) of the land where the water will be dammed, and the land that will be inundated, or, if owned by the Crown (i.e. Crown riverbed), the land adjacent to the dam. A copy of your certificate of title may be obtained from Land Information New Zealand ([www.linz.govt.nz](http://www.linz.govt.nz)). LINZ may also require a licence for you to occupy the bed of the water body with your intake structure (please contact LINZ directly).

\*If the dam is on the bed of a large river (particularly “navigable rivers”) the bed will likely be owned by the Crown. The beds of smaller watercourses are sometimes owned by the adjacent landowner(s).

#### **Question B.3**

NZTM 2000 maps are generally available from Public Libraries or may be purchased from Government Book Shops.

#### **Question B.4**

If you are unsure of the name of the water body, and your application is a replacement of an existing consent, the easiest way to find out the name of the water body from which you are seeking to dam is by checking your existing resource consent. If you are unsure of the name of the water body and the application is for a new dam, please contact an Otago Regional Council staff member who will be able to assist you. In many instances tributaries to larger water bodies do not have official (or legally recognised) names. If this is the case describe the water body as “an unnamed tributary of .....”. If the water body has an unofficial local name you could continue to write “... locally known as.....”. You can determine if a name is legally recognised by seeing if it is written on published topographic maps (see question B.3), or if any road bridges crossing it state the name of the water body (i.e. Transit or Automobile Association signs).

#### **Question B.5**

A general site plan showing as much detail of the location of your proposed dam and surrounding land as possible should be provided. This will assist Council’s assessment of your application and may reduce processing time and costs.

### **Part C: Description of the Water Resource/Catchment**

This section covers the characteristics of the water resource that you are proposing to dam. Tick the appropriate boxes and answer the appropriate questions in both either **B.1 or B.2**, as applicable.

#### **Question C.1**

Describe the watercourse which is to be dammed. For question (a) - a watercourse can be perennial (flows all year around) or ephemeral (flows intermittently or when there is rain). For questions (b) – (g): It is recommended that you engage a hydrologist to calculate the hydrological regime of the watercourse if you are unable to obtain this information yourself. Flows in your river may be measured at certain locations by Council or other organisations (e.g. NIWA). For question (j), the bed composition may be mud, silt, sand, gravel or rock, or a combination of these.

Questions (j) and (k) - The Otago Fish and Game Council and the Department of Conservation should be able to assist you in identifying the aquatic flora and fauna, and the aquatic waterfowl associated with the watercourse.

#### **Question C.2**

Describe the area outside of a watercourse which is to be dammed. Please estimate how much natural runoff the dam is likely to intercept. To what watercourse would the runoff have discharged to if the dam was not present? What is the predominant land use of the catchment of the dam?

#### **Question C.3**

Describe any faults or landslips that may be present at the dam site or in the greater area around the dam. Is the dam site within a flood zone? Are there any other hazards present that may impact on the dam structure?

### **Part D: Dam Design Details**

#### **Question D.1**

(a) and (b) You should engage a chartered professional engineer to undertake an assessment of dam safety, if the risk posed by the dam is greater than “low”. An assessment of dam safety should be undertaken with reference to the NZSOLD Dam Safety Guidelines (Technical Publication 109, June 2000). For (c) – (f), what are the estimated dates of start and finish of construction, and dam filling, should consent be granted. For (g), describe the geotechnical conditions of the land where the dam is to be built, and the construction requirements. For (h), the photographs requested will allow Otago Regional Council staff to make an assessment of the dam / proposed dam, and will allow determination of whether a site visit is necessary.

#### **Question D.2**

Please give the dimensions of your dam, and the details of the flows it is designed to contain and pass, and any design details to allow for fish passage. Details of the dam design, including plans, calculations and the results of on-site tests should be provided in a separate report accompanying this application form. For D.2.5 you should engage a chartered professional engineer experienced in the design and construction of dams to provide a plan of your proposed dam. The level of detail you provide should be appropriate for the scale of your proposal (that is, the larger the scale, the more detailed the plans should be). In addition, for stormwater ponds you should provide details of the ways in which the dam will be operated for stormwater detention or treatment.

#### **Question D.3**

You should provide a description of the ways in which the dam will be maintained to provide for its safe operation. You should include detail of any methods as recommended by the NZSOLD Guidelines (2000), including if a dam safety review will be undertaken, and whether an emergency action plan will be prepared.

#### **Question D.4**

If your dam has a risk greater than “low”, you should provide a description of the ways in which the dam will be operated and maintained to provide for its safe operation.

#### **Question D.5**

Please provide a report detailing all the potential impacts and adverse effects that could occur downstream of the dam in the event of its failure. This will help Council assess the potential risks of the proposed structure. In addition, provide comment as to whether public liability insurance will be held, or is held, to cover any damage likely in the event of dam failure.

### **Part E: Assessment of Effects on the Environment**

In this section you need to consider what the effects of your proposed take will have on the environment. You **must** provide an answer to all questions from **E.1 – E.6**.

#### **Question E.1**

(a) & (b) You need to consider whether your proposed dam will have any effect on the availability of water for other users. This will depend on the volume of water you propose to dam relative to the size of the water body and the distance downstream to the next inflow of water (i.e. where the next stream or tributary joins the water body you propose to dam).

(c) The items listed in this question are those that are commonly affected by dams. You need to consider if any of these are present in the vicinity of your proposed dam and if they are, then you will need to discuss how your proposed dam will affect them. Dams can lower the water levels of the water body (e.g. the dam may reduce the depth of water downstream of the point of the dam). This will depend on the type of water body which you are damming and the amount of water you are proposing to dam.

#### **Question E.2**

What other individuals or organisations who use this water body, or for whom the water body supports natural or cultural values, may be affected by your proposed dam? How might your dam affect them? For example, in a creek used for trout and salmon spawning, your take may affect their habitat by lowering the water level, thus Fish and Game may be an affected party. If the water body has significance to Iwi the effect of the dam may be more difficult for you to ascertain, as the values of the water body to them may be less tangible (if in doubt, it may be beneficial to consult Iwi).

#### **Question E.3**

There are a number of possible “positive” effects that dams can result in. These can include economic benefits to the community, secure water supplies for irrigation, and many others.

#### **Question E.4**

The amount of monitoring likely to be required will depend on a number of factors such as the quantity of water you are proposing to dam, the size of the water resource, and the pressure on the resource. A consent holder will commonly be required to measure the quantity of water they take on a daily basis and submit “water use records”. In other cases, downstream flow measurement recording, water quality and/or biological monitoring may be required. In addition, the NZSOLD Guidelines (2000) require ongoing monitoring for the safe operation of a dam.

#### **Question E.5**

Please tick any relevant boxes and explain how any proposed methods will avoid, remedy or mitigate any actual or potential effects on the environment.

### **Part F: Alternative Locations and Methods**

#### **Question F.1**

Please identify any alternative methods or locations of damming, as well as any other alternative water sources available to you. Please provide reason(s) why have you not chosen any of these alternative methods, locations or water sources.



## **Part G: Consultation**

### **Questions G.1 and G.2**

Council can advise you of those parties considered to be potentially adversely affected by your proposed activity and can also instruct you regarding Iwi consultation. In some instances it may be appropriate for you to submit your application and let Council determine who they think may be adversely affected by your proposal. Because Council charges time on an hourly basis, you may choose to consult these parties and seek their written approval to your application yourself, or you may choose for Council to pursue this for you. However, if an application is submitted without written approvals of potentially affected parties, the application goes “on hold” until these written approvals have been received. Failure to obtain written approvals within a reasonable timeframe can result in your application being notified.

## **Part H: Is Your Application Complete?**

### **Question H.1**

A complete application will assist Otago Regional Council in efficiently processing your application. If information is missing or inadequate your application may be returned to you or declined. Please ensure that you have fully completed the application form and included the items listed from (a) – (f). You will also need to complete Form 1, and any other relevant schedules for activities associated with the damming. Applications that are incomplete or do not provide sufficient information will be delayed and will cost more.

**If you have any queries relating to information requirements,  
please contact the Otago Regional Council Offices:**

**Dunedin Office  
70 Stafford St  
Private Bag 1954  
Dunedin  
Phone 03 474 0827  
Fax 03 479 0015**

**Alexandra Office  
Dunorling St  
PO Box 44  
Alexandra  
Phone 03 448 8063  
Fax 03 448 6112**

**Queenstown Office  
Cnr Shotover & Camp St  
PO Box 958  
Queenstown  
Phone 03 442 5681  
Fax 03 442 5682**

**Freephone: 0800 474 082**

**Website: [www.orc.govt.nz](http://www.orc.govt.nz)**



# Project Memorandum

26 May 2020

Landpro Reference: S15298

Council Reference: RM20.079

**To:** Charles Horrell, consultant planner on behalf of ORC

**From:** Will Nicolson, Landpro

**Subject:** Additional information and assessment of effects regarding the damming of water at Bendigo Station, in relation to Deemed Permit Replacement Application RM20.079

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Dear Charles,

The following information is provided in response to your May 14<sup>th</sup> email, which requested a further application under Section 91 of the RMA in relation to the Bendigo Station irrigation pond.

## 1. Overview

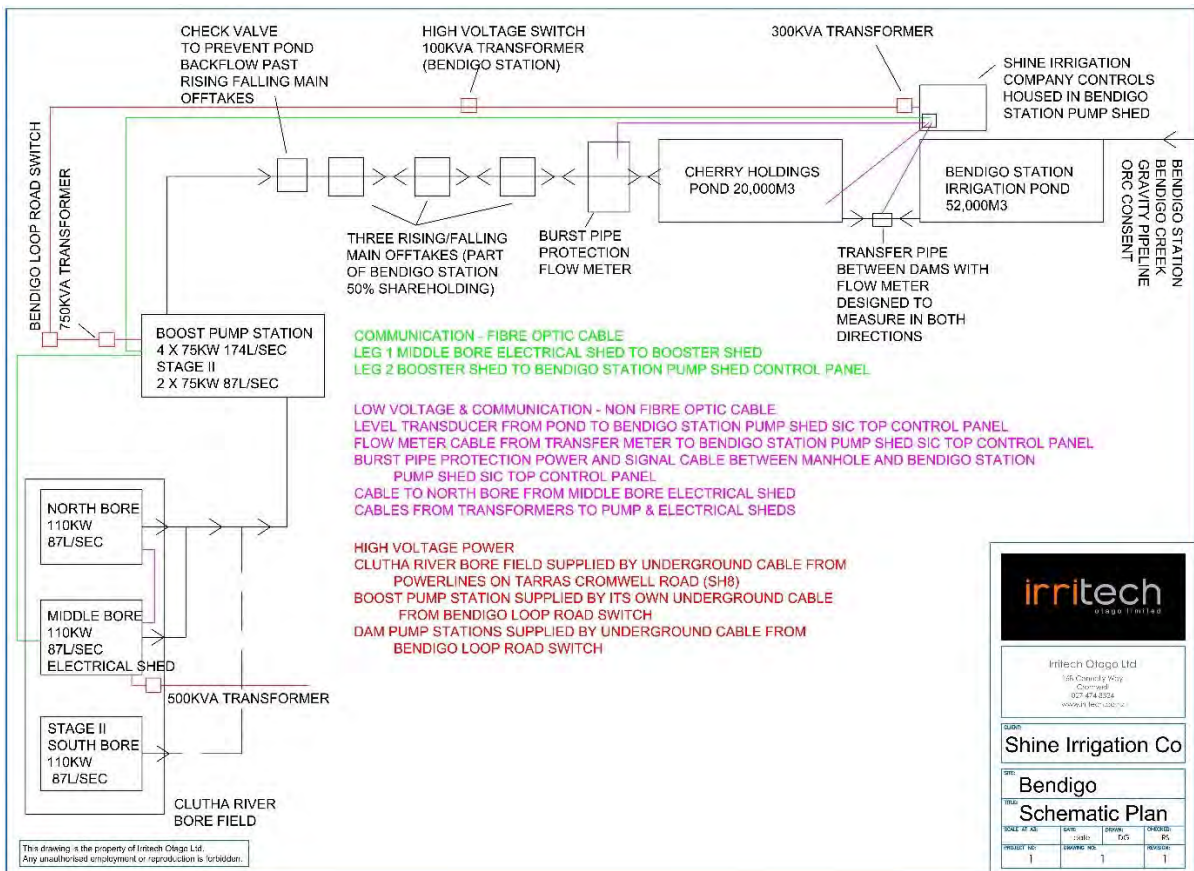
The Bendigo Station irrigation pond, henceforth referred to as Bendigo Pond, receives Bendigo Creek water authorised via Deemed Permits WR3908Cr and WR1233Cr. Water is conveyed via pipe from the abstraction point on the creek to the pond, as shown in Figure 1 below.

The current location of Bendigo Pond was formerly occupied by a duck pond. With an increasing need for reliable water supply to support pasture, orchard and vineyard expansions, Bendigo Station excavated and re-contoured the existing pond to form two new ponds – the aforementioned Bendigo Pond, and the Cherry Holdings pond (Figures 2 & 3). The ponds are shaped to accommodate a centre pivot, the tracks of which run between the two ponds.

Of the two ponds, Bendigo Pond is the sole recipient of Bendigo Creek water, which is then used for irrigation of pasture and vineyard (Figure 4). The Cherry Holdings Pond receives water from a bore (G41/0435) located close to the Clutha River, with abstractions authorised via RM17.194.01. The Cherry Holdings Pond will provide water for an estimated 202 ha of cherry orchards once development is complete. This pond is located on Bendigo Station land but easements are in place to enable access for the orchard developer, Cheri Holdings Ltd (formerly Cherry Holdings Ltd).

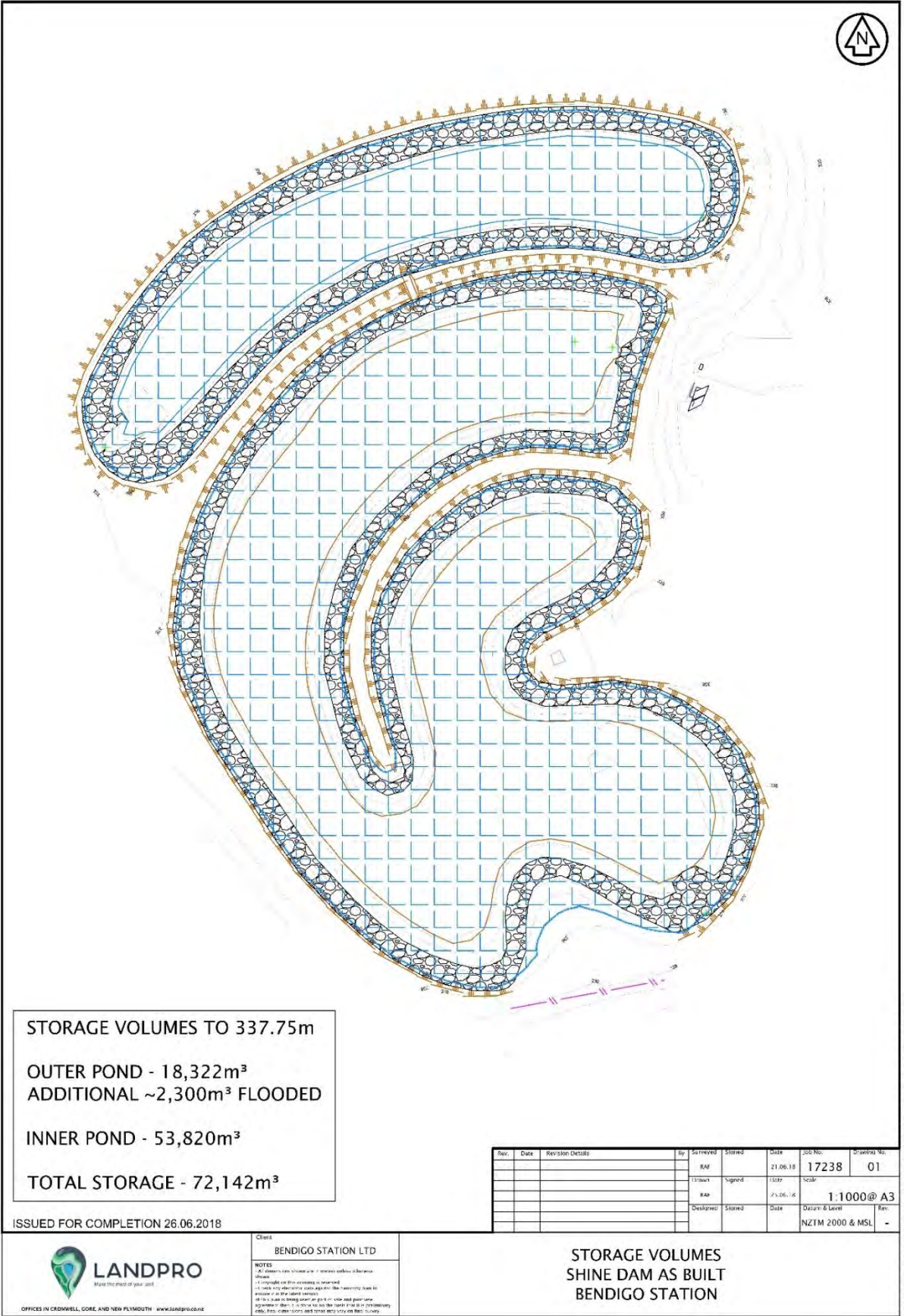


**Figure 1: Bendigo Creek take point, conveyance infrastructure and Bendigo Pond**



**Figure 2: Water infrastructure schematic in relation to the Bendigo and Cherry Holdings ponds**





**Figure 3: Bendigo Pond (inner pond) & Cherry Holdings Pond (outer pond) as built**



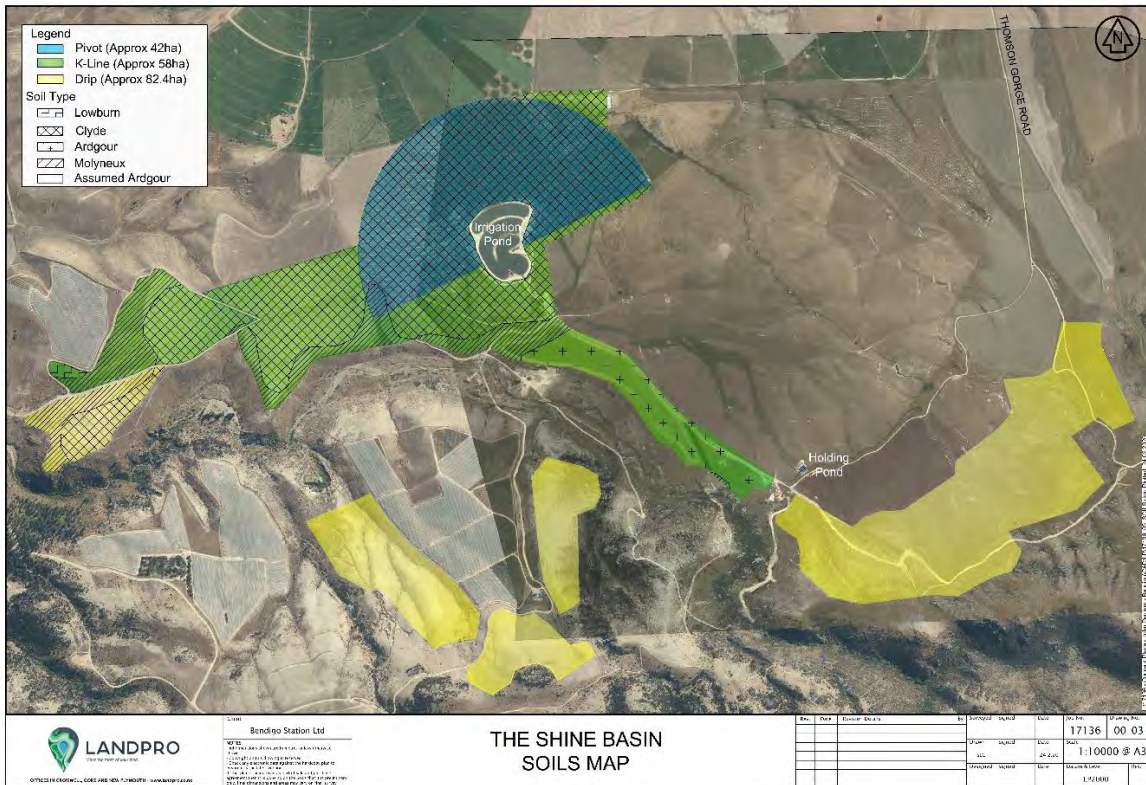


Figure 4: Irrigation areas serviced by water from Bendigo Pond, with blue areas representing pasture irrigated by pivot, green pasture via k-line, and yellow vineyard via drip irrigation

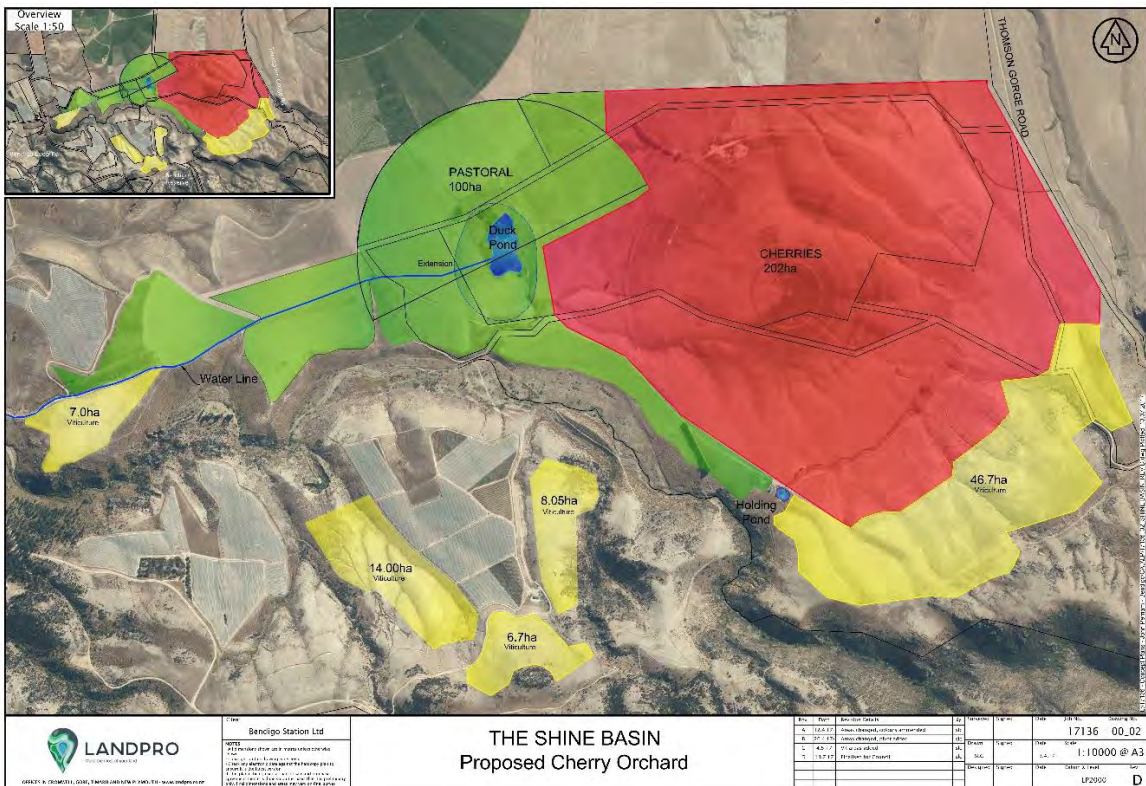


Figure 5: Map prepared prior to upgrade of the duck pond showing existing and proposed areas to be irrigated by both ponds. The green and yellow zones are irrigated with Bendigo Pond water, while the red area (comprising 202 ha of cherries) is irrigated with Cherry Holdings Pond water



## 2. Bendigo Pond details

As shown in Figure 3, at maximum capacity Bendigo Pond has capacity to hold 53,820 m<sup>3</sup> of water, with a water depth of up to 3 m. Anything over this volume discharges back to Bendigo Creek via a spillway at the southeast corner of the pond (Figures 6 & 7).



**Figure 6: Bendigo Pond spillway and beginning of overflow channel**

There is a pipe that connects Bendigo Pond to the Cherry Holdings Pond, enabling the applicant to transfer water between the ponds when required by opening a valve (Figure 2). A meter can record flow in either direction between the two ponds, however it is noted that under typical operation the two ponds will remain disconnected.

Bendigo Pond is not situated in the bed of any watercourse or natural water feature and was built 'turkey nest' style to avoid the impacts of damming on waterways. At the time that the pond was built, no resource consents were considered necessary for ponds built outside of a watercourse. Location-related details were provided in the original (27 February 2020) AEE prepared for the replacement of Deemed Permits WR3908CR and WR1233CR. Land use immediately surrounding Bendigo Pond is pasture, however there is a raised lake house at the southern end of the pond.

A large dam is defined in Section 7 of the Building Act as a dam that has a wall height of at least 4 m above ground level and holds at least 20,000 m<sup>3</sup>. As the Bendigo Pond dam height is less than 4 m, it is not

considered to be a large dam, and was thus able to be built without the need for a building consent. This also means that the NZSOLD Guidelines have less applicability to the proposal.

The pond is not lined, as it has a naturally-occurring clay substrate. Based on the isolated nature of the pond, the fact that the reservoir is inset (dug into the ground rather than raised above ground level), and the relatively small volume of water impounded, it is assumed that the Dam Potential Impact Classification (PIC) as per the NZSOLD Guidelines (2015) is Low.



**Figure 7: Bendigo Pond overflow path and discharge back to Bendigo Creek**





**Figure 8: Bendigo Pond, looking northwest**

### 3. Abstraction from Bendigo Pond

As discussed in the original deemed permit replacement AEE lodged with council, water is taken from Bendigo Pond at NZTM2000 1313447E 5019532N for irrigation use. Figure 4, above, provides a breakdown of the irrigation areas currently serviced or proposed to be serviced by water taken from Bendigo Pond, while Section 6.6 of the original AEE presents an assessment of volumes sought against Aqualinc efficient use calculations.

There is little logic in requiring the applicant to limit their abstraction from the pond via a condition of consent, given that the pond in question is not situated in-stream and abstraction from the creek is already governed by a separate consent. Imposing restrictions on abstraction from the pond would also require the applicant to meter and report on yet another abstraction, which seems an unnecessary additional cost for an activity which otherwise places less pressure on the environment (by reducing instantaneous demand on Bendigo Creek through irrigation water storage).

However, were Council to impose instantaneous and volumetric limits on abstraction from Bendigo Pond, the following limits would be sought:

- 87 L/s (based on the Aqualinc peak daily demand of 7,494 m<sup>3</sup>)
- 235,948 m<sup>3</sup>/month



- 1,080,568 m<sup>3</sup>/year

Note that these rates and volumes reflect May 22, 2020 revisions to those Aqualinc efficient use calculations provided in the original AEE.

## 4. Description of existing environment

Please refer to Section 3 of the original AEE.

## 5. Activity classification

Bendigo Pond exceeds permitted Rule 12.3.2.1(b) of the RPW, due to the volume of water being stored being greater than 20,000 m<sup>3</sup>. As such, the damming of water is a **discretionary** activity under Rule 12.3.4.1(i) of the RPW.

The Cherry Holdings Pond is designed to hold 18,322 m<sup>3</sup> under normal operating conditions, is less than 3 m deep, and meets all other permitted activity requirements of RPW Rule 12.3.2.1.

Water will be taken from Bendigo Pond and used for irrigation, stock drinking, and domestic purposes. The volumes taken exceed the permitted activity thresholds under the RPW, therefore the taking of water from Bendigo Pond is a **discretionary** activity under Rule 12.1.5.1 of the RPW.

The occasional discharge of Bendigo Pond water to Bendigo Creek is a permitted activity under Rule 12.C.1.1 of the RPW.

## 6. Non-notification and consultation

As the effects of the proposed activities are considered to be no more than minor, notification of the application is not considered necessary. Further details can be found in Section 5 of the original AEE.

No parties are considered affected by this application.

## 7. Assessment of environmental effects

### 7.1 Assessment of alternatives

The applicant has already invested heavily in upgrading a former duck pond to Bendigo Pond's present state. The pond is situated at the heart of productive pastures, vineyards and future cherry orchards, and is not likely to endanger human life or the environment. As such, it is in the optimum location.

### 7.2 Water allocation

Water taken from Bendigo Pond is lawfully abstracted from Bendigo Creek via Deemed Permits WR3908CR and WR1233CR, both of which have been the subject of a recent replacement application. No additional water from Bendigo Creek is being sought as part of this application.

The use of storage aids in the efficient use of water, and is actively encouraged via Policy 6.6.2 of the RPW.

### **7.3 Dam safety**

As discussed earlier, Bendigo Pond is not a “large” dam under the Building Act, and as such is not subject to a requirement for building consent. If required to assess the pond under the NZSOLD Dam Safety Guidelines (2015), the PIC would most likely be Low. Furthermore, given that the pond is constructed ‘in ground’ the volume of water that could escape the dam in the event of failure is very low, and no people or property (other than Bendigo Station) would likely be impacted as a result. Effectively the design of the dam is such that it counters the potential for failure of a dam wall (which may lead to inundation) given it has no walls and is built into the ground.

### **7.4 Ecology**

As Bendigo Pond has been constructed well outside of the bed of a watercourse, there will be no adverse effects on aquatic ecology. The pond may provide a small ecological benefit in terms of creation of habitat for waterfowl and invertebrates.

### **7.5 Natural character & amenity**

Bendigo Pond is situated in an area that has long been given over to pastoral land use. The pond is not at odds with character and amenity values associated with this type of land use, and is typical of other farms around the area.

### **7.6 Positive effects**

Bendigo Pond was designed to improve water security for irrigation and stock drinking and reduce instantaneous reliance on water in Bendigo Creek. Both of these factors have positive effects on the environment, helping Bendigo Station to continue operating at a productive level and therefore contributing to the local economy, and ensuring that more water remains in Bendigo Creek downstream of the abstraction, with less variability in flows.

### **7.7 Monitoring**

Information has been presented in Section 3 above as to why the re-take from Bendigo Pond should not need to be metered. As abstraction from Bendigo Creek is already metered, and given the pond only receives Bendigo Creek water, the proposal should still be in accordance with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010. It is noted that in rare instances where the applicant needs to transfer water from the Cherry Holdings Pond to Bendigo Pond (or vice versa), the applicant is able to meter the rate and volume transferred. A condition requiring the keeping of records of transfer volumes between ponds would be acceptable to the applicant.

## 8. Statutory considerations

Schedule 4 of the RMA requires that an assessment of the activity against the matters set out in Part 2 and any relevant provisions of a document referred to in Section 104 of the RMA is provided when applying for a resource consent for any activity. These matters are assessed as follows.

### 8.1 Part 2 of the RMA

The proposal is consistent with the purpose and principles of the RMA. The proposal will have a less than minor effect on the ability of the environment to meet the reasonably foreseeable needs of future generations, or on the life-supporting capacity of the environment. The proposal ensures that adverse effects on the environment are avoided or mitigated.

There are no matters of national importance under Section 6 of the RMA that will be affected by the proposal. The proposal is also consistent with the requirements of Section 7 of the RMA, with particular regard given to the efficient use of natural resources. Regarding Section 8, the proposed activity is not inconsistent with the principles of the Treaty of Waitangi.

Overall, the activity is considered to be consistent with Part 2 of the RMA, given the minor nature of the activities.

### 8.2 Section 104(1)(b) of the RMA

In accordance with Schedule 4 of the RMA, an assessment of the activity against the relevant provisions of a document referred to in 104(1)(b) of the RMA must be included in an application for resource consent. Documentation in this section are noted as being:

- (i) National Policy Statement for Freshwater Management, 2014
- (ii) Resource Management (Measurement and Reporting of Water Takes) Regulations, 2010
- (iii) Partially Operative Otago Regional Policy Statement, 2019
- (iv) Partially Operative Regional Policy Statement for Otago, 1998
- (v) Proposed Regional Policy Statement for Otago, 2015
- (vi) Regional Plan: Water for Otago, 2004

Under the RMA, regional plans need to give effect to national policy statements (NPSs), NESs and regional policy statements (RPSs). Thus, for a consent application, an assessment of the application against the regional plan is usually adequate as these plans ultimately give effect to the higher order statutory instruments.

Additionally, for the sake of completeness, the National Policy Statement for Freshwater Management 2014 (NPSFM) has also been considered below.

### 8.2.1 National Policy Statement for Freshwater Management

The NPSFM sets objectives and policies for the management of freshwater quality and quantity, emphasising the need for safeguarding of the values of freshwater, avoiding over-allocation, improving efficiency and providing reasonable opportunity for iwi and hapū involvement in overall freshwater management including planning and decision-making. The following policy, is of most relevance to this application for resource consent.

#### *Policy B8*

*By every regional council considering, when giving effect to this national policy statement, how to enable communities to provide for their economic well-being, including productive economic opportunities, while managing within limits.*

The proposal to continue impounding water at Bendigo Pond will provide the applicant the water security they need to continue their irrigation operations throughout the season. This will ensure that the farm can continue operating at optimum levels, thereby supporting the local economy and community. The pond also enables the storage of water, which can minimise the need to abstract water directly from the waterway during periods of extreme low flow, as storage can be utilised at this point to enable ongoing irrigation.

### 8.2.2 Partially Operative Regional Policy Statement for Otago

Policies from the 2019 Partially Operative Regional Policy Statement as they relate to the proposal have already been considered in the original AEE, and are not therefore repeated here.

### 8.2.3 Regional Plan: Water for Otago

A comprehensive assessment of RPW policies as they relate to the take and use of Bendigo Creek water was provided in the original AEE. The following policies specifically relate to damming of water.

6.6.2 *To promote the storage of water at periods of high water availability through:*  
*(a) The collection and storage of rainwater; and*  
*(b) The use of reservoirs for holding water that has been taken from any lake or river.*

8.5.3 *To require the holder of any resource consent for a dam on the bed of a lake or river to remedy any adverse effect attributable to the failure or overtopping of the dam structure, either during or after its construction.*

The granting of a permit to dam will enable the applicant to continue storing water for deferred use. This is very much in line with Policy 6.6.2, particularly considering the applicant's recent application to take water as supplementary allocation from Bendigo Creek, which would enable the applicant to take water during high flows and use it during times of water shortage. Due to the design and size of the dam, there is a low risk of failure and the consequences of a failure would be relatively minor.

### 8.3 Other matters

The original AEE provided due consideration of cultural statutory requirements, including those matters that would pertain to the current proposal.

## 9. Consent duration

A consent term of 25 years is sought, to align with the term sought for the applicant's deemed permit replacements.

## 10. Concluding comments

A decision to grant consent pursuant to Section 104B under delegated authority can be made on the basis that:

- a) It is expected that the adverse effects on the environment will be minor or less;
- b) The proposal meets the non-notification requirements of Section 95A of the RMA; and
- c) The proposal is consistent with the requirements of the RMA, Council policy and other relevant matters.

Granting of the consent will be consistent with the purpose of the RMA for the reasons explained within this report. The proposed activities are not expected to result in further degradation of water quality and potential adverse effects will be avoided or mitigated as far as practicable.

Kind Regards,



Will Nicolson

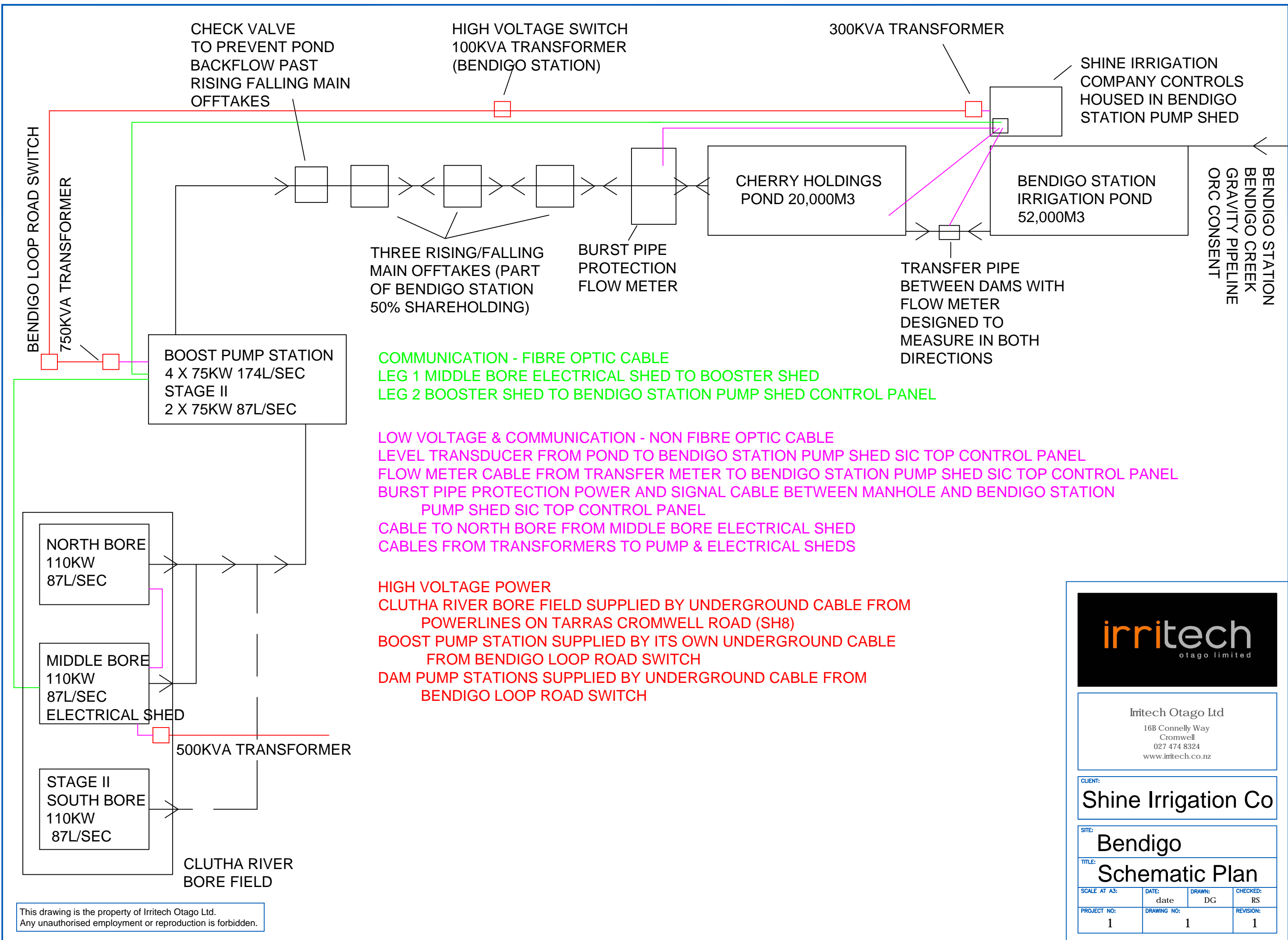
Scientist/Resource Management Planner

## **Appendix A – full-size maps and images**









**COMMUNICATION - FIBRE OPTIC CABLE**  
 LEG 1 MIDDLE BORE ELECTRICAL SHED TO BOOSTER SHED  
 LEG 2 BOOSTER SHED TO BENDIGO STATION PUMP SHED CONTROL PANEL

**LOW VOLTAGE & COMMUNICATION - NON FIBRE OPTIC CABLE**  
 LEVEL TRANSDUCER FROM POND TO BENDIGO STATION PUMP SHED SIC TOP CONTROL PANEL  
 FLOW METER CABLE FROM TRANSFER METER TO BENDIGO STATION PUMP SHED SIC TOP CONTROL PANEL  
 BURST PIPE PROTECTION POWER AND SIGNAL CABLE BETWEEN MANHOLE AND BENDIGO STATION PUMP SHED SIC TOP CONTROL PANEL  
 CABLE TO NORTH BORE FROM MIDDLE BORE ELECTRICAL SHED  
 CABLES FROM TRANSFORMERS TO PUMP & ELECTRICAL SHEDS

**HIGH VOLTAGE POWER**  
 CLUTHA RIVER BORE FIELD SUPPLIED BY UNDERGROUND CABLE FROM POWERLINES ON TARRAS CROMWELL ROAD (SH8)  
 BOOST PUMP STATION SUPPLIED BY ITS OWN UNDERGROUND CABLE FROM BENDIGO LOOP ROAD SWITCH  
 DAM PUMP STATIONS SUPPLIED BY UNDERGROUND CABLE FROM BENDIGO LOOP ROAD SWITCH

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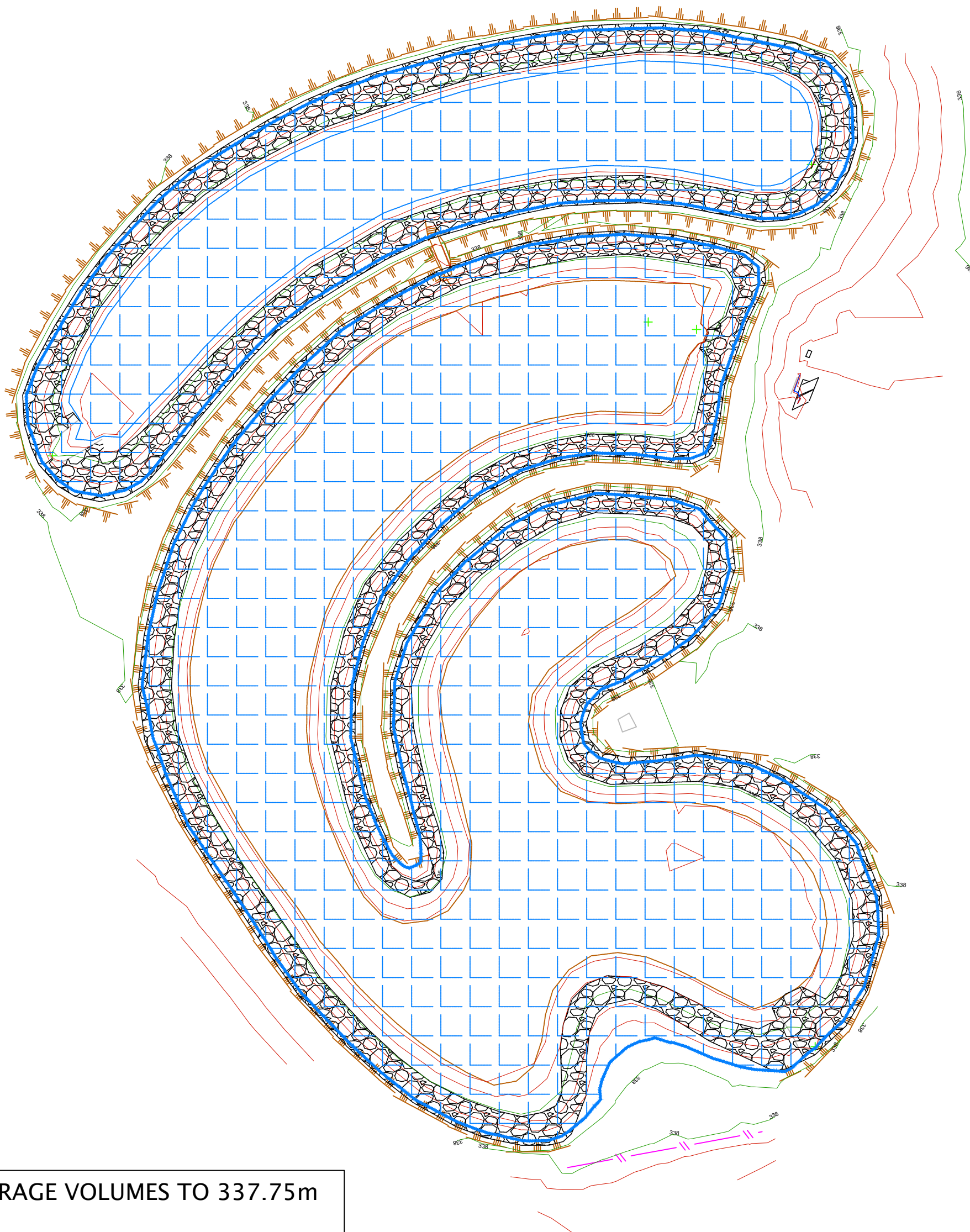
CLIENT:  
**Shine Irrigation Co**

SITE:  
**Bendigo**

TITLE:  
**Schematic Plan**

SCALE AT A3:	DATE: date	DRAWN: DG	CHECKED: RS
PROJECT NO: 1	DRAWING NO: 1	REVISION: 1	





**STORAGE VOLUMES TO 337.75m**

**OUTER POND - 18,322m<sup>3</sup>  
ADDITIONAL ~2,300m<sup>3</sup> FLOODED**

**INNER POND - 53,820m<sup>3</sup>**

**TOTAL STORAGE - 72,142m<sup>3</sup>**

ISSUED FOR COMPLETION 26.06.2018

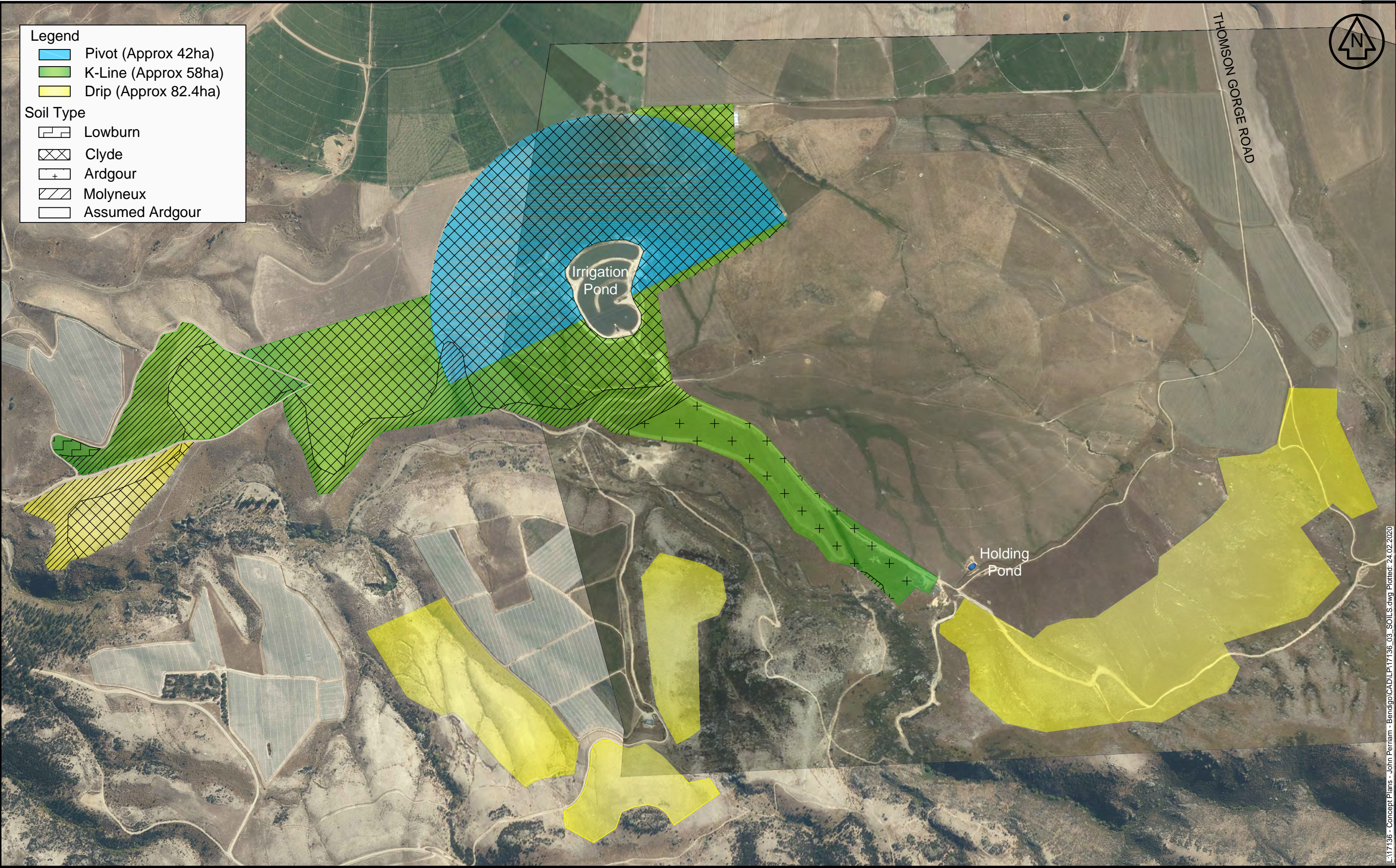
Rev.	Date	Revision Details	By	Surveyed	Signed	Date	Job No.	Drawing No.
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				RAF	Signed	25.06.18	Scale 1:1000@A3	
				Designed	Signed		Datum & Level	Rev.
							NZTM 2000 & MSL	-

Client  
**BENDIGO STATION LTD**

**NOTES**  
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 - Check any electronic data against the hardcopy plan to ensure it is the latest version  
 - If this plan is being used as part of sale and purchase agreement then it is done so on the basis that it is preliminary only, final dimensions and areas may vary on final survey

**STORAGE VOLUMES  
SHINE DAM AS BUILT  
BENDIGO STATION**





**Legend**

- Pivot (Approx 42ha)
- K-Line (Approx 58ha)
- Drip (Approx 82.4ha)

**Soil Type**

- Lowburn
- Clyde
- Ardgour
- Molyneux
- Assumed Ardgour

L:\17136 - Concept Plans - John Perrin - Bendigo\CAD\LP17136\_03\_SOILS.dwg Plotted: 24.02.2020



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Client  
**Bendigo Station Ltd**

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## THE SHINE BASIN SOILS MAP

Rev.	Date	Revision Details	By	Surveyed	Signed	Date	Job No.	Drawing No.
							s15298	00_03
				Drawn	Signed	Date	Scale	
				SLC		24.2.20	1:10000 @ A3	
				Designed	Signed	Date	Datum & Level	Rev.
							LP2000	