LANDPRO
Make the most of your land

22 May 2020

Landpro Reference: S15298
Council Reference: RM20.079

ATTN: Charles Horrell
Otago Regional Council
70 Stafford Street
Dunedin, 9054

Dear Charles,

It recently came to our attention that the volumes sought in the Bendigo Station Ltd consent replacement application dated 27 February 2020 were incorrect. The attached memo provides reasoning for this error, and justification for the proposed new monthly and annual volumes. The new allocation sought from Bendigo Creek is as follows:

- 235,948 m^3/month
- 1,080,568 m^3/year

No change to the instantaneous rate of take is proposed.

If you have any questions in relation to this amendment, please don't hesitate to contact me directly.

Kind Regards,

Will Nicolson
Scientist/Resource Management Planner

0800 023 318
13 Pinot Noir Drive
PO Box 302
Cromwell 9342
Central Otago, NZ
info@landpro.co.nz
landpro.co.nz

1 Resource Consent Application

Otago Regional Council

This application is made under Section 88 of the Resource Management Act 1991.

(For Office Use Only)
Deposit Paid: $

Charges / Deposits

A deposit **must** accompany the application (see page **8** for amounts). The applicant will be invoiced for all costs incurred in processing this application that exceed the deposit.

Council can accept electronic lodgement of applications if sent to consents.applications@orc.govt.nz. Include "consent application" in the subject line.

Please complete the application in pen. For questions marked with an * you will find notes on page 4

1.* Applicant(s) Details

Applicant(s) name(s) in full: _____

_____

_____

_____

OR Company Name (in full) Bendigo Station Limited

OR Names of Trustees (in full) if Applicant is a Trust _____

_____

or Name of Incorporation _____

Postal Address 1460 Tarras-Cromwell Road
RD 3
Cromwell Post Code 9383

Street Address _____
(not a P O box number) _____
_____ Post Code _____

Phone Number Business _____ Private _____
Mobile 021 447 268 Fax _____

Email Address grantporter@xtra.co.nz

Please provide a valid and clear email address. Otago Regional Council is moving to a paperless consenting process – therefore any correspondence including decision documents and consent (if granted) will be sent via email, unless you request a paper copy.

If you do not prefer contact by electronic means, please tick ☐

1(a). Key Contact for Applicant Details

If the applicant consists of multiple parties (e.g. multiple consent holders, Trust etc) please outline who the key contact for the consent will be, if granted.

Key contact name(s) in full: _____

_____

_____

_____

Postal Address _____

_____

_____ Post Code _____

Street Address _____

(not a P O box number) _____

_____ Post Code _____

Phone Number Business _____ Private _____

Mobile _____ Fax _____

Email Address _____

Please provide a valid and clear email address. Otago Regional Council is moving to a paperless consenting process – therefore any correspondence including decision documents and consent (if granted) will be sent via email, unless you request a paper copy.

If you do not prefer contact by electronic means, please tick ☐

2.* Consultant/Contact Details (if not applicant)

Name of Consultant/ Contact Person: Will Nicolson - Landpro Ltd

Postal Address PO Box 302

Cromwell

_____ Post Code 9342

Phone Number Business _____ Private _____

Mobile 027 459 8090 Fax _____

Email Address will@landpro.co.nz

Please provide a valid and clear email address. Otago Regional Council is moving to a paperless consenting process – therefore any correspondence including decision documents and consent (if granted) will be sent via email, unless you request a paper copy.

If you do not prefer contact by electronic means, please tick ☐

3. On Site Supervisor/Manager Contact Details (if applicable)

Name of On Site Supervisor/Manager Person:

Postal Address _____

_____

_____ Post Code _____

Phone Number Business _____ Private _____

Mobile _____ Fax _____

Email Address _____

Please provide a valid and clear email address. Otago Regional Council is moving to a paperless consenting process – therefore any correspondence including decision documents and consent (if granted) will be sent via email, unless you request a paper copy.

If you do not prefer contact by electronic means, please tick ☐

4.* a) Are there any current or expired resource consents relating to this proposal?

☒ Yes ☐ No

If yes, give Consent Number(s) and Description: Deemed Permits WR3908Cr & WR1233Cr

_____

_____

b) Do you agree to your current consent automatically being surrendered should a replacement consent be issued.

☐ Yes ☐ No

c) Has there been a previous application for this activity that was returned as incomplete?

☐ Yes ☐ No

If yes, give Consent Number(s) and Description: _____

_____

_____

d) Have you a pre-application lodged with Council for this activity?

☐ Yes ☐ No

If yes, give pre-application Number(s) and Description: _____

_____

_____

e) Have you spoken to a Council staff member about this application prior to lodging this application?

☐ Yes ☐ No If yes, please state name of staff member _____

5. The applicant is (tick one): ☐ owner ☐ leasee ☐ prospective purchaser **of the land on which the activity occurs.**

6*. Who is the owner of the land on which the activity occurs/is to occur? (only complete if applicant is not the landowner)

Name of landowner: _____

Postal Address _____

_____

_____ Post Code _____

Phone Number Business _____ Private _____

Mobile _____ Fax _____

Email Address _____

7*. Who is the occupier of the land on which the activity occurs/is to occur? (only complete if the applicant is not the land occupier)

Name of land occupier _____

Postal Address _____

_____

_____ Post Code _____

Phone Number Business _____ Private _____

Mobile _____ Fax _____

Email Address _____

8*. Who leases the land on which the activity occurs/is to occur? (only complete if land is leased and it is not leased to the applicant)

Name of land leasee _____

Postal Address _____

_____

_____ Post Code _____

Phone Number Business _____ Private _____

Mobile _____ Fax _____

Email Address _____

9. Tick the consents required in relation to this proposal:

Water

☐ Take Surface Water ☐ Divert

☐ Take Groundwater ☐ Dam

Discharge onto or into:

☐ Land ☐ Water ☐ Air

Land Use:

☐ Bore construction ☐ Bore alteration

☐ Activities in or on beds of lakes or rivers or floodbanks

☐ Disturbance of contaminated land

Coastal: ☐ Activities in the coastal marine area (i.e., below mean high water spring tide)?

Where you have indicated the type of consent that is required, you must complete the appropriate Application Form before your application can be processed. Application Forms can be found on the Council's website: www.orc.govt.nz.

10. What is the maximum term of consent you are seeking? 25 years

11.Territorial Local Authority in which activity is situated?

☐ Dunedin City Council ☐ Queenstown Lakes District Council

☐ Clutha District Council ☐ Waitaki District Council

☐ Central Otago District Council

12*. Do you require any other resource consent from any local authority for this activity?

☐ Yes ☐ No

If Yes, please list: _____

Have these consents been applied for/issued? ☐ Yes ☐ No If Yes

If Yes, please give the date applied for or issued: _____

Notes on Application Form Details

1. **Applicant(s) Details**

A resource consent can only be held by a legal organisation or fully named individual(s). A legal organisation includes a limited company, incorporated group or registered trust. If the application is for a trust the full names of all trustees are required. If the application is not for a limited company, incorporated group or trust, then you must use fully named individual(s).

2. **Consultant/Contact Details**

If you are using a consultant/agent for this application put their details here. If you are not, leave question 2 blank.

4 Previous Consent

Do you currently have a resource consent to do the activity that you are applying to renew with this application? If so, please enter the permit number if known and a brief description including the date of issue and the expiry date.

6-8 **Landowner, occupier and leasee**

If you are not the landowner, land occupier or leasee of the land where the activity will be undertaken, you may be required to obtain their unconditional written approval to your application. On pg 6 there is a form that can be used.

12. **Additional Consents**

If you are carrying out earthworks or building work you may need other consents from either the ORC or your Territorial Local Authority.

Declaration

Before signing the declaration below, in order to provide a complete application have you remembered to:

Fully completed this Form 1 and the necessary Application Forms ☐

Attached the required deposit.(or pay on line) (see page 8 for deposit that is payable) ☐
Cheques payable to Otago Regional Council

Please note: your deposit may not cover the entire cost of processing your application. At the end of the application process you will be invoiced for any costs that exceed the deposit. Interim invoices may be sent out for applications, where appropriate.
If the required deposit does not accompany your application, staff will contact you on the phone number provided on this form to request payment, and after 3 working days your application will returned if no payment is made for the required deposit.

I/we hereby certify that to the best of my/our knowledge and belief, the information given in this application is true and correct.

I/we undertake to pay all actual and reasonable application processing costs incurred by the Otago Regional Council.

Name/s WILLIAM NICOLSON (on behalf of applicant)
(BLOCK CAPITALS)

Signature/s _____
(or person authorised to sign on behalf of applicant)

Designation Consultant Date 26/02/2020
(e.g., owner, manager, consultant)

Otago Regional Council Postal Address: 70 Stafford St, Private Bag 1954, Dunedin 9054

Consultation

– (consultation is not compulsory, but it can make a process easier and reduce costs).

Under Section 95E of the Resource Management Act 1991 (the Act) the Council will identify affected parties to an application and if the application is to be processed on a non-notified basis the unconditional written approval of affected parties will be required. Consultation with potentially affected parties and interested parties can be commenced prior to lodging the application.

Consultation may be required with the appropriate Tangata Whenua for the area. The address of the local Iwi office is: Aukaha, 258 Stuart Street, P O Box 446, Dunedin, Fax (03)477-0072, Phone (03) 477-0071, email: info@aukaha.co.nz. If you require further advice please contact the Otago Regional Council.

Good consultation practices include:

- Giving people sufficient information to understand your proposal and the likely effects it may have on them
- Allowing sufficient time for them to assess and respond to the information
- Considering and taking into account their responses

Written approval forms are appended to this form on Page 9.

Information Requirements

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**. Where an application is significantly incomplete, the Consent Authority may decide not to accept the application for processing.**

Resource Management Act 1991
FOURTH SCHEDULE—ASSESSMENT OF EFFECTS ON THE ENVIRONMENT

(Below are the provisions of the 4th schedule of the Act, which describes what must be in an application for resource consent, as amended in 2015.)

1 Information must be specified in sufficient detail

Any information required by this schedule, including an assessment under clause 2(1)(f) or (g), must be specified in sufficient detail to satisfy the purpose for which it is required.

2 Information required in all applications

(1) An application for a resource consent for an activity (the **activity**) must include the following:

(a) a description of the activity:

(b) a description of the site at which the activity is to occur:

(c) the full name and address of each owner or occupier of the site:

(d) a description of any other activities that are part of the proposal to which the application relates:

(e) a description of any other resource consents required for the proposal to which the application relates:

(f) an assessment of the activity against the matters set out in Part 2:

(g) an assessment of the activity against any relevant provisions of a document referred to in section 104(1)(b). *("document" includes regional & district plans, regulations*, *national policy statements, iwi plans*)

(2) The assessment under subclause (1)(g) must include an assessment of the activity against—

(a) any relevant objectives, policies, or rules in a document; and

(b) any relevant requirements, conditions, or permissions in any rules in a document; and

(c) any other relevant requirements in a document (for example, in a national environmental standard or other regulations).

(3) An application must also include an assessment of the activity's effects on the environment that—

(a) includes the information required by clause 6; and

(b) addresses the matters specified in clause 7; and

(c) includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

3 Additional information required in some applications

An application must also include any of the following that apply:

(a) if any permitted activity is part of the proposal to which the application relates, a description of the permitted activity that demonstrates that it complies with the requirements, conditions, and permissions for the permitted activity (so that a resource consent is not required for that activity under section 87A(1)):

(b) if the application is affected by section 124 or 165ZH(1)(c) (which relate to existing resource consents), an assessment of the value of the investment of the existing consent holder (for the purposes of section 104(2A)):"(c) if the activity is to occur in an area within the scope of a planning document prepared by a customary marine title group under section 85 of the Marine and Coastal Area (Takutai Moana) Act 2011, an assessment of the activity against any resource management matters set out in that planning document (for the purposes of section 104(2B)

4 (relates to subdivisions- *not included here as subdivisions not ORC jurisdiction.)*

5 Additional information required in application for reclamation

An application for a resource consent for reclamation must also include information to show the area to be reclaimed, including the following:

(a) the location of the area:

(b) if practicable, the position of all new boundaries:

(c) any part of the area to be set aside as an esplanade reserve or esplanade strip.

Assessment of environmental effects

6 Information required in assessment of environmental effects

(1) An assessment of the activity's effects on the environment must include the following information:

(a) if it is likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity:

(b) an assessment of the actual or potential effect on the environment of the activity:

(c) if the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment that are likely to arise from such use:

(d) if the activity includes the discharge of any contaminant, a description of—

(i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and

(ii) any possible alternative methods of discharge, including discharge into any other receiving environment:

(e) a description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect:

(f) identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted:

(g) if the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved:

(h) if the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group).

(2) A requirement to include information in the assessment of environmental effects is subject to the provisions of any policy statement or plan.

(3) To avoid doubt, subclause (1)(f) obliges an applicant to report as to the persons identified as being affected by the proposal, but does not—

(a) oblige the applicant to consult any person; or

(b) create any ground for expecting that the applicant will consult any person.

7 Matters that must be addressed by assessment of environmental effects

(1) An assessment of the activity's effects on the environment must address the following matters:

(a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects:

(b) any physical effect on the locality, including any landscape and visual effects:

(c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity:

(d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations:

(e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants:

(f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations.

(2) The requirement to address a matter in the assessment of environmental effects is subject to the provisions of any policy statement or plan.

Set out below are details of the amounts payable for those activities to be funded by fees and charges, as authorised by s36(1) of the Resource Management Act 1991.

Resource Consent Application Fees (from 1 July 2018)

Note that the fees shown below are a **deposit** to be paid on lodgement of a consent application and applications for exemptions in respect of water metering devices. This deposit will not usually cover the full cost of processing the application, and further costs are incurred at the rate shown in the scale of charges. GST is included in all fees and charges.

If you wish to make a payment via internet banking, or on line, the details are below. Please note the applicants name and "consent application" should be used as reference when paying the deposit -

For on line payments go to www.orc.govt.nz and go to Home/ Rates/ Way to Pay and follow prompts

Publicly Notified Applications: [3]	**$**
First application	5,000.00
Concurrent applications	225.00

Non Notified Applications and Limited Notified Applications: [3]	**$**
First application (except those below)	1,000.00
Concurrent applications [1]	50.00
Variation to conditions – s127	1,000.00
Administrative variation – s127	500.00
Exemptions from water measuring Regulations	200.00
Bores	500.00
Gravel	500.00

Hearings	Per Note 2 below
Payment for Commissioner request – s100A	Per Note 4 below

Objections	
Payment for Commissioner request – s357AB	Per Note 4 below

Transfers and Certificates Deposits:	**$**
Transfer of permits and consents	100.00
Priority Table	100.00
Section 417 Certificate	200.00
Certificate of Compliance	200.00
Section 125 – Extension of lapse date	100.00
All Other Costs	As per Scale of Charges

Scale of Charges:	**From 1 July 2018 $**
Staff time per hour:	
* Executive staff	235.00
* Senior Technical/Scientist	170.00
* Technical/Scientist	125.00
* Field Staff	100.00
* Administration	85.00
Disbursements	Actual
Additional site notice	Actual
Advertisements	Actual
Vehicle use per kilometre	0.70
Travel and accommodation	Actual
Testing charges	Actual
Consultants	Actual
Commissioners	Actual
Photocopying and printing	Actual
Councillor hearing fees per hour	
*Chairperson	100
*Member	80
*Expenses	Actual

Notes

1. For additional permits in respect of the same site, activity, applicant, time of application, and closely related effect as the first application.

2. The deposit payable shall be 90% of the cost of a hearing as calculated by Council in accordance with information contained in the application file and using the scale of charges. The amount payable will be due at least 10 working days before the commencement of the hearing. If the amount is not paid by the due date, then the Otago Regional Council reserves the right under S36 (7) of the Resource Management Act to stop processing the application. This may include cancellation of the hearing.

Should a hearing be cancelled or postponed due to the non payment of the charge, the applicant will be invoiced for any costs that arise from that cancellation or postponement.

Following completion of the hearing process, any shortfall in the recovery of hearing costs will be invoiced, or any over recovery will be refunded to the applicant.

Under Section 100A of the RMA, one or more submitters may make a request to have a resource consent application heard by one or more hearing commissioners who are not members of Council. In this case the applicant will pay the amount that Council estimates it would cost for the application to be heard had the request not been made, and the submitter(s) who made the request will pay, in equal shares, the cost of the application being heard that exceeds that amount payable by the applicant.

Further, the applicant may request to have a resource consent application heard by one or more hearing commissioners who are not members of Council. In this case, the applicant will pay the full costs.

3. Where actual and reasonable costs are less than the deposit paid, a refund will be given.

4. Where an applicant requests under s100A (for a consent hearing) or under s357AB (for the hearing of an objection) an independent commissioner(s); the applicant will be required to pay any increase in cost of having the commissioner(s).

   Where a submitter(s) requests under s100A an independent commissioner(s) any increase in costs that is in addition to what the applicant would have paid shall be paid by the submitter. If there is more than one submitter who has made such request the costs shall be evenly shared.

Administrative Charges
The following one-off administration charges shall apply to all resource consent applications received:

Publicly Notified and Limited Notified Applications	**$**
First application	100.00
Concurrent applications	50.00

Non-Notified Applications	**$**
First application	50.00
Concurrent applications	25.00

Other	**$**
Certificate of Compliance	25.00
Section 417 Certificate	25.00
Exemptions from water metering regulations	25.00

Review of Consent Conditions
Following the granting of a consent, a subsequent review of consent conditions may be carried out at either request of the consent holder, or, as authorised under Section 128, as a requirement of Council. Costs incurred in undertaking such reviews will be payable by the consent holder at the rates shown in the Scale of Charges above.

Reviews initiated by Council will not be charged to consent holders.

Compliance Monitoring Charges (from 1 July 2017)

1. Performance Monitoring
The following charges will apply to the review of performance monitoring reports for all consent holders, except those listed in section 1.6 below. The charges shown are annual fixed fees per performance monitoring report or plan, and are inclusive of GST.

		From 1 July 2017
1.1 Discharge to Air Consent		***$***
Measurement of contaminants from a Stack report		86.00
Ambient air quality measurement of contaminants report		100.00
Management plans and maintenance records		33.50
Annual Assessment report		66.50
1.2 Discharge to Water, Land and Coast		***$***
• Effluent Systems	Environmental Quality report	46.50
	Installation producer statements	60.00
	Return of flow/discharge records	60.00
• Active Landfills	Environmental Quality report	58.00
	Management Plans	130.00
• Industrial Discharges	Effluent quality report	42.00
	Environmental report	92.50
	Return of flow/discharge records	60.00
Annual Assessment report		50.00
Management Plans – minor environmental effects		130.00
Management Plans – major environmental effects		260.00
Maintenance records		30.00

1.3 Water Takes

Verification reports	60.00
Annual assessment report	50.00
Manual return of data per take	80.00
Datalogger return of data per take sent to the ORC	50.00
Telemetry data per consent	35.00
Administration fee – water regulations	100.00
Low flow monitoring charge*	
- Kakanui at McCones	327.00
- Unnamed Stream at Gemmels	1,431.00

*Charge for monitoring sites established by the ORC specifically to monitor consented activities in relation to river flows.

1.4 Structures

Inspection reports for small dams	130.00
Inspection reports for large dams	260.00
Structure integrity reports	80.00

1.5 Photographs

Provision of photos	60.00

1.6 Set Fees for Specific Consent Holders

Performance monitoring fees will be charges as 75% of actual costs for the following consent holders

Dunedin City Council
Central Otago District Council
Clutha District Council
Queenstown Lakes District Council
Waitaki District Council
Ravensdown
Contact Energy
Trustpower
Pioneer Generation

Additional charges may be incurred for new consents granted during the year.

2. Audit

Audit work will be charged at half of the actual cost incurred, with the actual costs being calculated using the Scale of Charges.

3. Non-Compliance, Incidents and Complaints

Enforcement work on consent conditions, and remedying negative effects from permitted activities – Scale of Charges.

Gravel Inspection and Management

Gravel extraction fee – $0.66 per cubic metre (incl. GST). Where more than 10,000 cubic metres of gravel is extracted within a prior notified continuous two month period, the actual inspection and management costs will be charged, as approved by the Director Corporate Services.

Written Approvals of Persons Likely to be Adversely Affected

I/We (Please print full name/s)_____ _____

of (Address) _____

I /we have read the full application for the proposal by (Applicant)

_____

for a Resource Consent (Number) _____ to _____

_____
and give my/our written approval to the proposed activity/activities.

In signing this written approval I/we understand that:

- The consent authority must decide that I/we am/are no longer an affected person, and disregard adverse effects on me/us
- That /we I may withdraw my/our written approval in writing before the hearing, or if no hearing before a decision is made on the application.

Signature/s_____ Date _____
(or person authorised to sign on behalf of affected party/parties)

Phone _____ Fax _____ Email _____

Please note: If this application is subsequently notified the above approval does not constitute a submission as required under Section 96 of the Resource Management Act 1991.

Written Approvals of Persons Likely to be Adversely Affected

I/We (Please print full name/s)_____ _____

of (Address) _____

I /we have read the full application for the proposal by (Applicant)

_____

for a Resource Consent (Number) _____ to _____

_____
and give my/our written approval to the proposed activity/activities.

In signing this written approval I/we understand that:

- The consent authority must decide that I/we am/are no longer an affected person, and disregard adverse effects on me/us
- That /we I may withdraw my/our written approval in writing before the hearing, or if no hearing before a decision is made on the application.

Signature/s_____ Date _____
(or person authorised to sign on behalf of affected party/parties)

Phone _____ Fax _____ Email _____

Please note: If this application is subsequently notified the above approval does not constitute a submission as required under Section 96 of the Resource Management Act 1991.

Resource Consent Application Form 4

To take and use surface water

This application is made under Section 88 of the Resource Management Act 1991.

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1. Note to applicants

The purpose of this form is to provide applicants with guidance on information that is required for your application under the Resource Management Act 1991. This form acts as a guide only and Otago Regional Council reserves the right to request additional information.

Please ensure that you fully complete this form **as well as** a fully completed resource consent application form (form 1) in support of your application, **and** preparation of an **Assessment of Environmental Effects** in terms of the Fourth Schedule of the Resource Management Act 1991. Failure to do so may result in Council rejecting your application, requesting further information, or publicly notifying your application, leading to delays in the processing of your application and potential increases in processing costs.

Acceptance of your application for processing does not constitute a guarantee that water allocation is available.

2. General

2.1 This application is for (please tick any applicable box):

A new surface water take

An application to replace a current Water Permit

Water permit number: *Expiry date:*

An application to replace a Deemed Permit / Mining Privilege

Deemed permit number: WR3908Cr & WR1233Cr *Expiry date: 01/10/2021*

2.2 A lapse period of _____5 years____ is sought. Provide reasons in application attached.

Note: This is the timeframe within which the consent must be given effect to. The default timeframe is 5 years after the date of commencement of the consent unless stated otherwise.

2.3 A consent term of ____25 years_____is sought. Provide reasons in application attached.

Note: This is the timeframe from the date of commencement of the consent which the consent will expire.

2.4 Provide a map or coloured aerial photograph which outlines the following details (as applicable):

The location of the existing and proposed point(s) of take and all associated infrastructure (including water races and point of discharge and re-takes)

The location of the water measuring device(s) or system(s)

The total property area boundary

The area(s) to be irrigated (if relevant) by water applied for under this application

The area of the community supply (if relevant)

Distances to any discharge activities

Other surface water bodies and wetlands, and distances from the point of take(s) to them

The coastline and the distance to it (if relevant)

The location of any dairy shed(s)

The location of any known recreational activities, other water takes, areas of significance to iwi and areas where food is obtained from the water body.

2.5 Does the take hold a s417 certificate to confirm access of supply? If yes, please attach a copy.

Yes

No (however the applicant has indicated that there is an easement in place for the section of the intake and pipeline that is located on a neighbouring property. Evidence of this is currently being sought.)

3. Volume and rates of take applied for

3.1 Quantity and rate of take

Note: 1,000 litres = 1 cubic metre

a. Maximum rate of take: 50 L/s (primary); 110 L/s (supplementary)

b. Maximum monthly volume: 179,473 cubic metres per month

c. Maximum annual volume: 900,601 cubic metres per year

Note: Some deemed permits refer to hourly/weekly rates. Water permits are issued in litres per second, m^3 per month and m^3 per year. Should you wish to seek hourly or weekly rates ***in***

addition *to those listed on the form, please provide this information including justification for any variances.*

3.2 Frequency of take

Note both the maximum and estimated average take.

	Average	Maximum
How many hours per day?	**24**	**24**
How many days per week?	**7**	**7**
How many weeks per month?	**4**	**4**

3.3 In your application describe the timing of your take, including which months of the year you expect to take water in both an average year and a dry year, and what part of the day the water take will generally occur.

3.4 In your application describe whether the take is from re-charge or is an augmented take, along with whether your activity provides re-charge back into the catchment.

3.5 In your application provide details of all takes and discharges (re-take / biowash).

3.6 Storage

3.6.1 Do you intend to store your water before subsequent use?

Yes

No

3.6.2 If yes, what/how much storage will be provided?

53,820 m^3 (see AEE for further details)

3.6.3 In your application outline the type of storage facilities that are proposed.

Note: You may need a building consent and/or additional resource consents for the construction of storage facilities. If the reservoir is in a water body or captures catchment runoff, you may require resource consents for damming and associated activities.

4. Point(s) of take description

4.1 What are the GPS coordinates of the point(s) you propose to take water from?

Note: if there are more than two points of take, please provide these details on a separate sheet.

Point 1: NZTM 2000 E: 1314483 N: 5018116

Point 2: NZTM 2000 E: N:

4.2 Please provide photographs of the proposed point(s) of take ☑

4.3 What is the name of the water body/ies from which the proposed take(s) is/are to occur? Bendigo Creek

Note: if the water body is unnamed please note this and note the water body it flows into.

4.4 If the take is from a river, stream, spring, drain or modified water body, in your application please provide a full description of the water course, including:

The average channel width and depth at various locations including at the point of take and upstream and downstream of the point of take.

Average flow water velocity including source of flow data and any changes to flow velocity above and below the point of take.

Any flow gauging of the water body. A flow gauging report with photographs of the site and methodology to be attached. See AEE

Bed of the water body at the point of take and upstream and downstream of the point of take.

Please also answer the following:

4.4.1 What type of water body will the take/s occur from?

River

Stream

Modified water body

Spring

Drain

4.4.2 Is the water course perennial (flows all year round) or ephemeral?

Perennial (however the lower section of the creek is ephemeral – see AEE for further details)

Ephemeral

4.5 If the take is from a lake, pond or wetland please answer the following:

Lake

Pond

Wetland

4.5.1 If the take is from a wetland, is the wetland classed as a Regionally Significant Wetland identified in Schedule 9 of the Regional Plan: Water for Otago?

Yes (list the name and provide an assessment of effects on the wetland)

No

4.5.2 Has the wetland been formed by artificial means?

Artificial

Natural

4.5.3 What is the surface area of the lake/pond/wetland?

4.5.4 How deep is the lake/pond/wetland?

4.5.5 Does the lake/pond/wetland have an outlet? i.e. does water flow out of it?

Yes

No

4.5.6 What is the main source of water that fills the lake/pond/wetland?

Groundwater

Springs

Runoff from surrounding land

Direct rainfall

Stream/river (list name)

Other (provide details)

5. Historical water use

5.1 Water abstracted over at least the last 5 years

Note: if you are applying to replace an existing water permit for primary allocation, or an existing deemed permit or mining privilege you must provide evidence of the amount of water abstracted under that permit for at least the last five years.

The following usage evidence is provided in support of this application:

Water metering records, attached to this application with historical water use summarised and assessed

Water metering records sent to Council electronically or recorded on file by Council with historical water use summarised and assessed

Detail on alternative water use information, attached to this application

5.2 In your application please analyse and assess the historical volumes and pattern of water use based on the water use evidence.

5.3 Provide a summary of your analysis below:

a.	Maximum rate of take:	157 litres per second
b.	Maximum monthly volume:	132,450 cubic metres per month
c.	Maximum annual volume:	1,109,361 cubic metres per year

5.4 For which years have these rates and volumes been recorded? 2019-2020

6. Water use and management

6.1 For what purpose(s) will the water be used?

Stock water and/or dairy shed use

Irrigation (provide detail of irrigation use in your application attached)

Community supply

Commercial/industrial

Other (domestic supply)

6.2 Will the water take be managed as part of an existing water allocation committee or water management group?

Yes (name of committee of group):

No

6.3 If yes, have you described how the allocation committee/management group operates in your application?

Yes

No

6.4 In your application describe any water rationing regime that operates in the catchment.

6.5 Will the take applied for be operated in accordance with the rationing regime you have described in question 6.4?

Yes

No

6.6 Will you or others "re-take" water from your take (i.e. via a water race)? If yes, please provide details of such re-takes in your application.

Yes

No

7. Measuring and reporting

7.1 In your application describe the type of water metering system that is installed or proposed to be installed.

Note: If currently installed provide proof of installation or note if proof has already been provided to Council.

7.2 Provide information in your application demonstrating that the installation of the measuring device or system shall be undertaken in accordance with Council guidelines.

Note: If the installation is not able to meet these guidelines, you need to fill out and attach to this application form a Non-Standard Installation Form for Water Measuring Devices, available on our website or through the environmental services unit of the Council.

Tick if completed

Tick if completing a Non-Standard Installation Form for Water Measuring Devices

7.3 Is your water measuring device or system installed or proposed to be installed at the point(s) of take?

Note: The council considers the point of take to be within a 100 metre radius of the physical take point. If your answer is No, you need to apply for a Water Measuring Exemption (WEX) by filling out Application Form 24 – Application for Exemption to use a device or system near the location from which water is taken. A fully completed Form 24 should be lodged at the same time as this application to enable dual processing.

Yes

No – WEX0287 application is lodged and awaiting a decision from Council.

7.4 Is winterisation of the measuring device proposed (i.e. is the measuring device disconnected in full or part in winter to protect against frost/cold)?

Yes, between _____ (state month) and _____ (state month)

No

8. Location and Efficiency of Water Use

8.1 Provide details of point/area of use (include legal description(s) and grid references).

Yes (attached to application)

No (please outline reasons why this has not been provided)

8.2 Provide a description of any existing works/infrastructure in place, including value, in your application.

Yes (attached to application)

No (please outline reasons why this has not been provided)

8.3 Provide a description of proposed works/infrastructure to give effect to consent sought, including value of investment, in your application.

Yes (attached to application) – value of infrastructure figures not yet available. This can take some time to compile.

No (please outline reasons why this has not been provided)

8.4 Provide an assessment of the proposed use against the Aqualinc report for reasonable water requirements[1].

Completed

Not Completed (provide details of alternative assessment and justification for that)

8.5 If you propose to use water to irrigate land, please outline:

a. How many hectares of land will be irrigated? See AEE

b. What is the soil type(s) of the land being irrigated?

c. What will you be irrigating (i.e. crop, pasture etc in ha)?

d. What is the target application rate (mm/day and mm/year)?

8.6 What type of irrigation system is proposed to be used or is currently being used?

K-line

Centre pivot

[1] *"Guidelines for reasonable irrigation water requirements in the Otago Region", Aqualinc, 2017. Note that while this document provides a basis for assessing efficiency of use, other matters may be applicable.*

Travelling irrigator

Border-dyke/flood irrigation

Other – provide details Drip (proposed)

8.7 Do you have any water distribution infrastructure in place (for example pipes, storage tanks, open races etc.)?

Yes

No

If yes, in your application please describe the type of infrastructure in place and how you intend to ensure that it is maintained in good working order (e.g. do you intend to have a maintenance or leak detection programme, will the scheme be managed by an external company).

Note: For deemed permits please ensure you have the right to convey water under s417 of the Resource Management Act if that conveyance crosses another party's property, prior to the expiry of the deemed permit.

8.8 Do you intend to install any water distribution infrastructure (for example pipes, storage tanks, open races etc.)?

Yes – details TBD and pending Council decision on permit replacements. May include installation of new pumps & pipes to convey water to proposed vineyards.

No

If yes, in your application please describe the type of infrastructure to be installed and how you intend to ensure that it is maintained in good working order (e.g. do you intend to have a maintenance or leak detection programme, will the scheme be managed by an external company).

Note: For deemed permits please ensure you have the right to convey water under s417 of the Resource Management Act if that conveyance crosses another party's property, prior to the expiry of the deemed permit.

8.9 If you propose to use water for stock and/or dairy shed use – please answer the following:

Note: The Council considers the following values as efficient use of water for stock:

Sheep	*See AEE*	*5 litres per day per head*
Beef cattle		*45 litres per day per head*
Dairy cows		*70 litres per day per head*
Deer		*15 litres per day per head*
Dairy shed use		*50 litres per day per head*

8.9.1 What type of animal and numbers of stock will be supplied with water for drinking?

Sheep See AEE

Number: Water required: litres/head/day

Beef cattle

Number: Water required: litres/head/day

Dairy cows

Number: Water required: litres/head/day

Other

Number: Water required: litres/head/day

8.9.2 How much water do you require for your dairy shed?

litres/head/day

8.9.3 If you are seeking more water for stock and/or dairy shed use than that recommended by the Council please state why this is in your application.

Note: please provide the source of any data provided. Also include details of stock water transportation if relevant.

8.10 If you propose to use water for industrial use – in your application state what type of industry will be using the water and how will the water be used.

8.11 If you propose to use water for community/domestic supply – please answer the following:

a. For households, the number of households to be supplied: 1

b. For camping grounds, the maximum number of visitors and staff per year:

c. For schools, the maximum number of students and staff per year:

d. For motel units, the number and expected occupancy:

e. Other uses (please describe):

8.12 For all uses, demonstrate in your application how have you calculated the amount of water you need?

Note: Please note that the Council will only grant volumes that have been assessed as efficient, and will assess the volumes sought for efficiency, taking into consideration the local climate, soils, and crop type.

Tick if completed.

8.13 In your application please describe any other sources of water available for the property. How much water is available and what it is used for.

8.14 In your application please describe any measures you are proposing to minimise wastage of water and maximise its efficient use.

9. Assessment of Environmental Effects

Note: Pursuant to Schedule 4 of the Resource Management Act, 1991, there are a number of matters that must be addressed by an assessment of environmental effects. These matters are listed in Form 1, with additional or specific matters relating to water permits are listed below.

9.1 Assess effects on surface and/or ground water hydrology.

Yes (attached to application) See AEE
No (please outline reasons why this has not been provided in your application)

9.2 Provide an independent ecological assessment/instream assessment of the water body. It is recommended that all takes not from the main stem of a catchment have this assessment carried out.

Yes (attached to application)

No (please outline reasons why an independent ecological assessment has not been undertaken in your application)

9.3 Assess any physical effect on the locality, including any landscape and visual effect.

Yes (attached to application)

No (please outline reasons why this has not been provided)

9.4 Assess any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity of the point of take.

Yes (attached to application)

No (please outline reasons why this has not been provided)

9.5 Does the taking of water from the water body cause it to dry up during summer or does the water body naturally dry up downstream of the take?

Yes – see AEE

No

If Yes, your application should explain approximately how far downstream from your this occurs and in approximately which month in a wet year, average year and dry year this happens.

Note: Please discuss and attach any evidence to the application (e.g. photographs of water body downstream):

9.6 Assess effects on cultural values.

Yes (attached to application)

No (please outline reasons why this has not been provided)

9.7 Assess any effect on other water users or other human use values.

Yes (attached to application)

No (please outline reasons why this has not been provided)

9.8 Describe any positive effects from the take.

Yes (attached to application)

No (please outline reasons why this has not been provided)

9.9 Outline the mitigation you propose in your application. This should include a consideration of the following: See AEE

A residual flow

Fish screening on water intakes

Measures for management where there are low flows

Flow sharing measures

Whether base flow is necessary to maintain the water race

Any other applicable measures

9.10 Outline if your instantaneous abstraction rate (litres per second) will be reduced by increasing the length of time over which water is taken.

Yes (attached to application)

No

9.11 Provide a description of any possible alternative water sources or methods for undertaking the activity and why these alternatives have not been selected.

Yes (attached to application)

No (please outline reasons why this has not been provided)

10. Consultation

10.1 Include evidence of any consultation undertaken for this application.

10.2 Identify persons affected by this application.

See AEE

10.3 Which persons approval have been provided to the application (attach copies of approvals)?

*Note: This **may** include (but not be limited to) consultation with adjoining landowners, other consent holders in the immediate area such as downstream permit holders, iwi (e.g. Te Rūnanga O Ngāi Tahu, Aukaha, Te Ao Marama Inc.), government departments/ministries (e.g. DOC), territorial authorities and recreational associations. To reduce costs and processing times, we recommended that written approval is obtained and submitted with the application for parties which may be affected. Such approval must be unconditional to avoid notification.*

11. Statutory Assessment

Please note that in accordance with Schedule 4 of the RMA, you are also be required to provide an assessment against the relevant provisions of the following documents (if relevant):

National Policy Statement for Freshwater Management.

National Policy Statement for Renewable Electricity Generation.

Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.

National Environmental Standard for Sources of Human Drinking Water.

New Zealand Coastal Policy Statement.

Operative Regional Policy Statement 1998, Proposed Regional Policy Statement and Partially Operative Regional Policy Statement 2019.

Regional Plan: Water for Otago (including description of permitted activities and compliance with permitted activity standards; identification of Regionally Significant Wetlands and associated valves).

Kai Tahu ki Otago Natural Resource Management Plan 2005.

Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008 (for takes from the south side of the Clutha River/Mata-Au)

Any other relevant plan, proposed plan and any other relevant regulations.

LANDPRO

Make the most of your land

Resource Consent Application to Otago Regional Council

Prepared for Bendigo Station Limited

Prepared For
Bendigo Station Limited

Prepared By

Landpro Ltd
13 Pinot Noir Drive
PO Box 302
Cromwell
Tel +64 3 445 9905

QUALITY INFORMATION

Reference: L:\S15298 - Bendigo Stn - Consent Compliance\Docs\Deemed permit\Lodgement\20200203_S15298 Bendigo Station Ltd_AEE_Final.docx

Date: 27 February 2020

Prepared by: Will Nicolson

Reviewed by: Brodie Costello

Client Review: Grant Porter

Version Number: Final

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1. INTRODUCTION

1.1 Overview of Proposal

The applicant, Bendigo Station Limited, owns and operates a large station near Tarras, Central Otago. The applicant holds permits WR1233CR and WR3908CR, which together authorise abstraction of up to 83.3 L/s from Bendigo Creek for the purpose of irrigation and domestic use. The applicant also holds a number of other water permits (either under Bendigo Station Ltd or John Charles Perriam, the company owner and director), all of which are presented in the below table.

Table 1: Deemed/water permits servicing Bendigo Station Limited land

Permit	Details	Source	Consent holder	To be replaced?
WR1233CR	200,000 L/hr (55.6 L/s) for irrigation and domestic.	Bendigo Creek	John Charles Perriam	Yes
WR3908CR	100,000 L/hr (27.8 L/s) for irrigation and domestic.	Bendigo Creek	John Charles Perriam	Yes
WR1753CR.V2	Originally authorised to divert 140 L/s from the Lindis River into a race via WR7787/96CR. WR1753 was subsequently granted in 1905 to authorise abstraction of a further 283 L/s from the Lindis. **NOTE: permit no longer exercised.**	Lindis River	John Charles Perriam	No
2000.657	0.83 L/s from an unnamed spring for stock drinking and domestic.	Unnamed spring/surface water	John Charles Perriam holds 1/3 share	No
2001.A30	76.31 L/s for irrigating pasture.	Groundwater	Bendigo Station Limited	No
2003.058	56.5 L/s for irrigation.	Groundwater	Bendigo Station Limited	No
RM14.128.01	108 L/s for irrigation. Held by Shine Irrigation Co Ltd.	Groundwater from the Clutha River & Bendigo Aquifer	Bendigo Station Limited	No

The applicant seeks only to replace Deemed Permits WR1233CR and WR3908CR, which are due to expire on 1 October 2021. As abstraction under these two permits is authorised to occur at the same location, it is requested that a single permit with combined rates and volumes be granted. The applicant also seeks to transfer the consent holder name for these two permits from John Charles Perriam to Bendigo Station Limited.

Note that WR1753CR.V2 is no longer utilised, and all groundwater permits held by Bendigo Station Limited are used to irrigate areas of the farm that are outside the scope of this application.

As this application is being made more than 6 months prior to the expiry of WR1233CR and WR3908CR, the applicant can continue to operate under the existing permits as per s124 of the RMA until a decision is made on the application.

1.2 The Applicant

Applicant Address: 1460 Tarras-Cromwell Road
RD 3
Cromwell 9383

Address for Service: C/- Landpro Limited
PO Box 302
Cromwell 9342

1.3 Purpose of Documentation

Pursuant to Section 88 of the Resource Management Act 1991 (the RMA), this report provides an assessment of the activity's effects on the environment as required by Schedule 4 of the RMA.

2. DETAILS OF PROPOSAL

2.1 Scheme overview

Bendigo Station encompasses approximately 11,000 hectares of the terraces and hills to the southwest of Tarras. Due to it's considerable size, the farm sources irrigation and stock water from a variety of sources, with the majority being made up of groundwater. Bendigo Creek supplies water to an area of the station known as the Shine Basin, which includes an area of existing irrigated pasture along with future proposed vineyards.

Figure 1 below provides an overview of the Bendigo Creek water take and storage infrastructure. A full-size copy of this figure is provided in Appendix A, along with other relevant plans and images.

Figure 1: Bendigo Creek water take infrastructure overview

Water is abstracted from a single location on Bendigo Creek via Deemed Permits WR3908Cr and WR1233Cr. Up until recently, a water race conveyed this water from the Creek down to the flats below, whereby it was used primarily for stock drinking supply. The applicant has since invested considerably in a closed conveyance system, whereby water is collected in the creek via a screened intake and transported approximately 2 km to the Bendigo Station irrigation pond via a 300 mm HDPE pipe (see Figure 1 and the below photos).

Water abstracted from Bendigo Creek is metered via WM1515, located approximately 750 m from the point of take. A water meter exemption application for locating the meter away from the take point was submitted to Council in April 2019, and Council has confirmed that this is still being processed. WEX0287 has been assigned to the application.

The irrigation pond features a spillway that feeds water back to Bendigo Creek, first via open channel and then via pipe. Clean water from the pond is discharged back into the creek approximately 1.8 km downstream from the point of take. The Bendigo Station pond (fed solely by Bendigo Creek water) can hold up to 53,820 m^3, and can be connected to the adjacent 18,322 m^3 Cherry Holdings pond (fed via groundwater and connected Clutha River water under Consents 2001.A30, 2003.058 & RM14.128.01) via a conduit where necessary (this does not occur often). Additional details relating to the ponds are provided in Appendix B.

Figure 2: Bendigo Creek intake (December 2019)

Figure 3: Looking past screened intake towards rock weir outlet

Figure 4: Pipeline carrying water abstracted from Bendigo Creek. The pipeline generally follows the old water race route.

Figure 5: Stockwater holding pond fed by Bendigo Creek water

Figure 6: Bendigo Station irrigation pond

Figure 7: Pond spillway

Figure 8: Bendigo Station irrigation pond overflow back to Bendigo Creek

From the Bendigo Station pond, Bendigo Creek water is used to irrigate approximately 100 ha of pasture (Figure 9). There are plans to establish new vineyard blocks at several locations on marginal hill land (which happens to be prime viticulture land), with the intention that up to 82.4 ha of future vineyard would be serviced by water pumped up from the Bendigo Station pond. Currently these areas earmarked for viticulture expansion are used for grazing merinos when conditions permit. The applicant is also in the process of converting approximately 202 ha of pasture to cherries, as shown in Figure 9. This cherry block, formerly on Bendigo Station land but now owned by Cherry Holdings Limited (not affiliated to the applicant), is to be serviced by water from the Cherry Holdings pond, with the first round of cherry tree plants to begin this year.

According to Cherry Holdings Limited, this new cherry block will need up to 170 L/s at peak demand, meaning some leftover groundwater may be available for supplementing Bendigo Creek water/filling the Bendigo Station pond when flows in the creek are low. This integrated approach should help to reduce instantaneous pressure on Bendigo Creek and ensure there are no on-farm water shortages during the dry season.

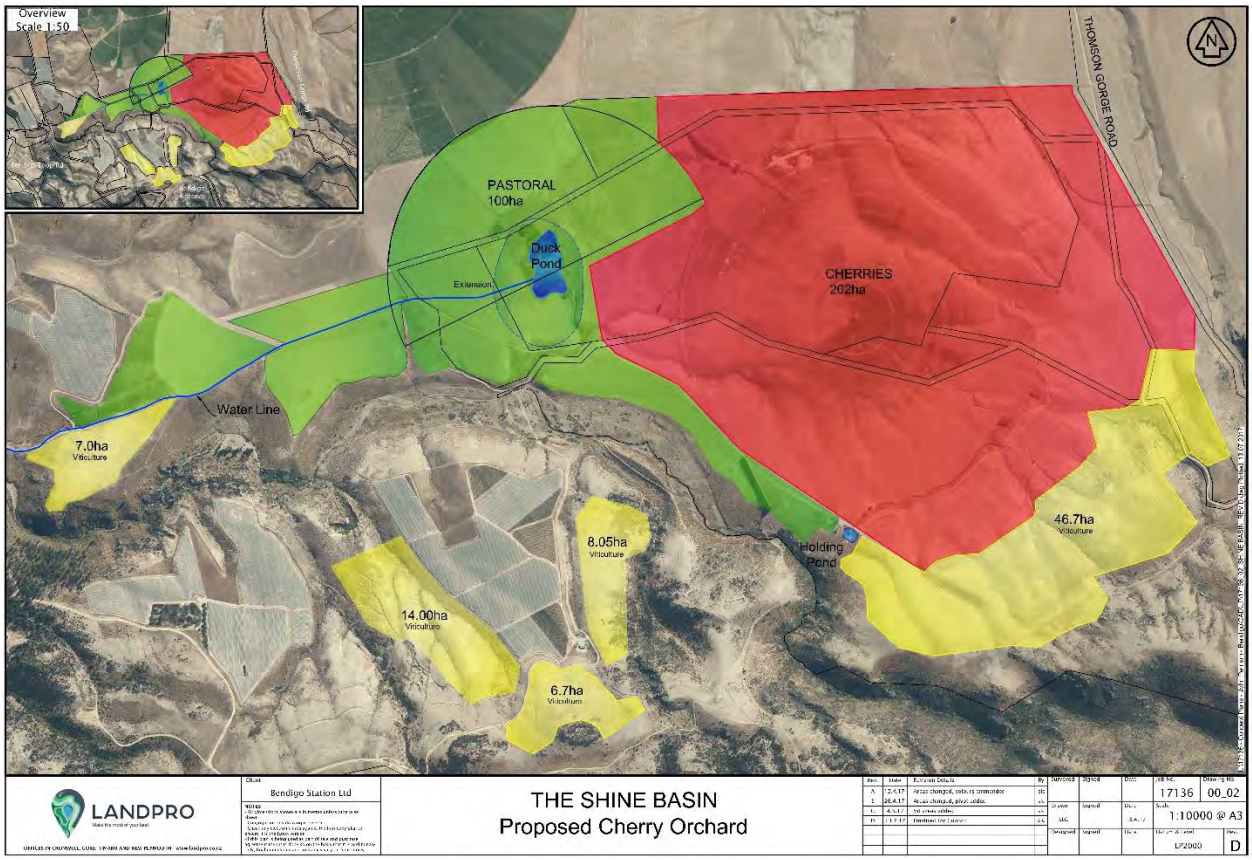


Figure 9: Irrigable areas currently serviced by Bendigo Creek water (green), to be serviced by Bendigo Creek water in future (yellow) or to be serviced by groundwater (red). Note that the duck pond shown reflects outdated mapping, and has since been upgraded to the 2 new storage ponds.

Table 2, below, lists relevant water infrastructure components and their locations.

Table 2: Bendigo Creek abstraction related infrastructure locations

Water infrastructure component	Location (NZTM2000)
Bendigo Creek intake	1314483E 5018116N
Stockwater holding pond	1314470E 5018734N
Bendigo Station pond inlet	1313468E 5019371N
Bendigo Station pond spillway	1313465E 5019362N
Pond overflow back to Bendigo Creek	1313331E 5019072N
Bendigo Station pond outlet to irrigation	1313447E 5019532N

The Bendigo Creek abstraction provides stock water for up to 6500 merino ewes, 5000 merino hoggetts, 250 breeding cows and 750 trading steers.

2.2 Records of title

The scheme abstraction and irrigation area encompasses numerous land parcels, a list of which is provided in the below table.

Table 3: Legal parcels related to the Bendigo Creek water take and use

Owner	Appellation	Record of Title	Water infrastructure
Her Majesty the Queen	Section 21 SO 24641	201479	WR3908Cr & WR1233Cr intake & top of pipeline
Bendigo Station Ltd	Lot 6 DP 525495	841228	WR3908Cr & WR1233Cr pipeline, irrigation (existing & future) & pond overflow discharge back to creek
Bendigo Station Ltd	Lot 5 DP 517385	841228	WR3908Cr & WR1233Cr pipeline & irrigation
Bendigo Station Developments Ltd	Lot 3 DP 391334	366552	Future vineyard irrigation
Bendigo Station Developments Ltd	Lot 4 DP 391334	366553	Future vineyard irrigation
Bendigo Station Ltd	Part Lot 10 DP 391334	841228	Irrigation
Bendigo Station Ltd	Lot 8 DP 517385	808254	Irrigation, pipeline and water storage
Bendigo Station Ltd	Lot 3 DP 459561	808254	Irrigation
Bendigo Station Ltd	Lot 7 DP 517385	808254	Irrigation
Bendigo Station Ltd	Lot 3 DP 525495	841227	Irrigation
Bendigo Station Ltd	Lot 4 DP 525495	841228	Irrigation
Bendigo Station Ltd	Lot 1 DP 525495	841226	Future vineyard Irrigation
Bendigo Station Ltd	Lot 2 DP 525495	841227	Irrigation
Bendigo Station Ltd	Lot 6 DP 517385	808256	Future vineyard Irrigation

It is our understanding the applicant holds an easement or concession to use and maintain the Bendigo Creek intake and section of the pipeline that is located on Department of Conservation (DoC) land. This has been difficult to locate, however, and may need to be provided at a later date.

2.3 Historic use and allocation sought

Based on documentation provided by ORC, the original predecessor to WR1233Cr was issued in 1902 while the original predecessor to WR3908Cr was issued in 1924. The former was granted for the purpose of mining irrigation and domestic while the latter was granted for irrigation (pasture) and domestic use. The abstraction location of WR1233Cr (originally on Bendigo Creek approx. 1 mile upstream from its Clutha River confluence)

appears to have been moved to it's current position at some point during the intervening years, while the WR3908Cr location has remained stationary since it's inception, with the original licence authorising the holder to construct "700 ft pipes then open race" – evidence of the original pipes can still be seen in certain places, with the new pipe alignment largely following that of the original.

In more recent years, Bendigo Station has been utilising their Bendigo Creek water rights for stock drinking purposes and limited irrigation due to outdated infrastructure. The aforementioned overhaul of the conveyance and storage system in 2019 has enabled the applicant to direct Bendigo Creek water to the newly upgraded Bendigo Station storage pond, whereby it is now being used for pasture irrigation via pivot and k-line, and also as potable water supply (with UV treatment) to the house located on the new pond.

Metering of the Bendigo Creek take has only occurred since the infrastructure upgrade and inception of using the deemed permit water for irrigation in addition to stock water. This means that there is only approximately 1 year worth of data, straddling 1.5 irrigation seasons. The figure below presents a relatively stable abstraction record from April 2019 onwards, the rate of take fluctuating roughly between 40 and 50 L/s and only a short break from abstraction in June.

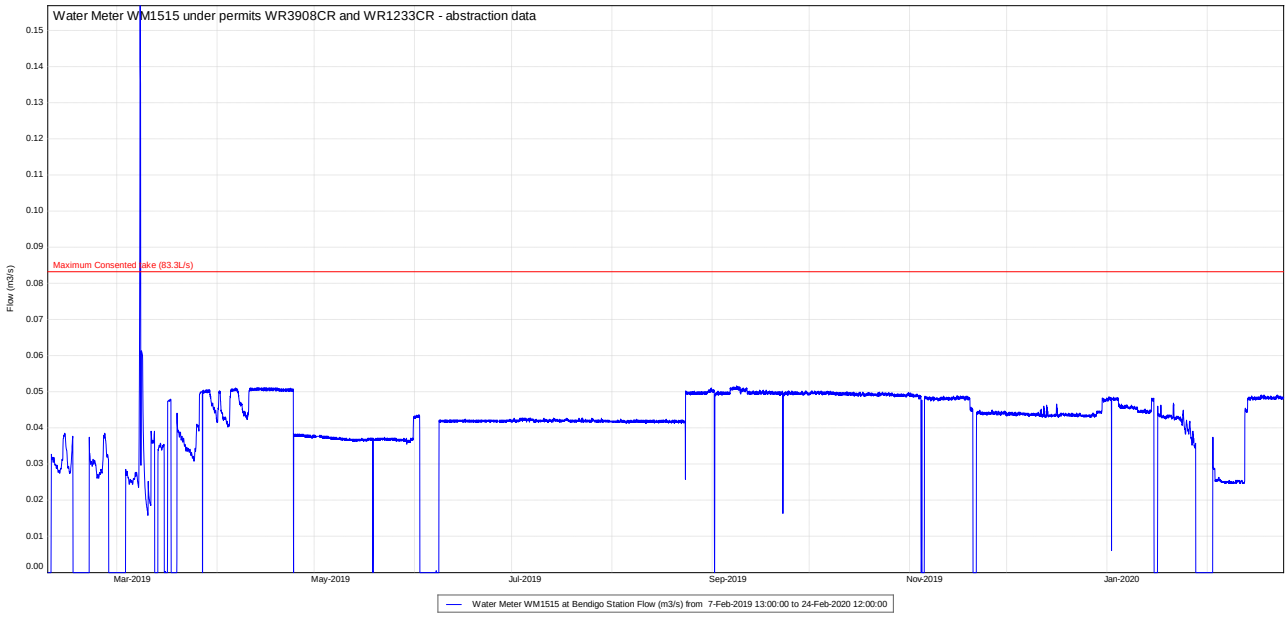


Figure 10: Deemed Permits WR3908Cr & WR1233Cr abstraction record (Source: Hilltop)

At present, 50 L/s is roughly what the applicant needs to irrigate existing pasture and provide water for stock drinking (see Section 6.6 for supporting calculations). As discussed, this demand for Bendigo Creek water will increase in future, in order to provide irrigation water for up to 82 ha of proposed vineyard.

While the water take record only encompasses one calendar year, it shows that abstraction is generally very consistent and that it is needed throughout the year to provide critical water for stock drinking and for filling the storage pond in advance of the irrigation season. While the new water take infrastructure is capable of conveying up to 160 L/s, the applicant has only been taking what they currently need and did not want to waste additional water simply for the sake of building a more compelling abstraction record.

The below graph presents the applicant's monthly Bendigo Creek abstraction volumes across the record. Note that no monthly data is shown on the graph for December 2019 and January 2020 due to malfunctions within the Hilltop software.

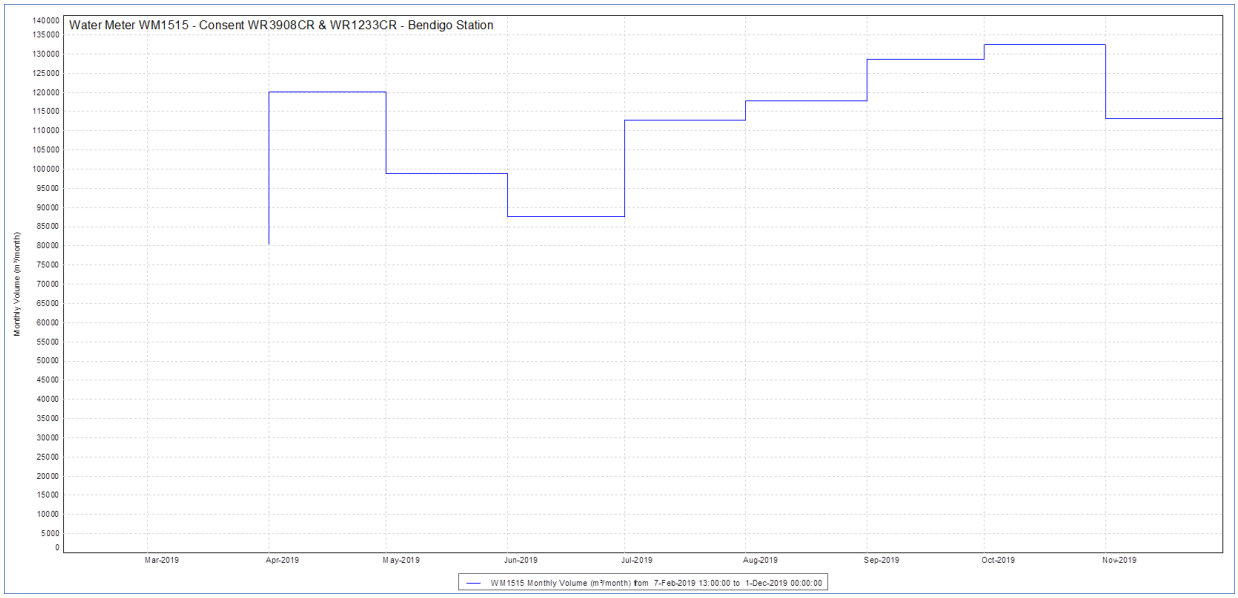


Figure 11: Bendigo Creek monthly abstraction volumes (Source: Hilltop)

Based on 1 calendar year of recorded data, maximum abstraction rates and volumes for the combined WR3908Cr and WR1233Cr takes are as follows:

- 157 L/s max instantaneous rate (08/03/2019)
- 132,450 m^3 max monthly volume (October 2019)
- 1,109,361 m^3 max annual volume (March 2019-January 2020). Note that this is an incomplete year, therefore the max annual volume would be expected to be considerably higher.

Based on the historic take record and the applicant's needs, the following rates and volumes are sought:

1. 50 L/s primary allocation. This has been determined not on what the applicant needs (which will be significantly more than this rate, with future vineyards expansions) but the historic take record, in order to comply with Policy 6.4.2A of the RPW, which prevents the taking of more water under primary allocation than has been taken over the past 5 or more years.

2. 110 L/s supplementary allocation. Supplementary abstraction could occur when flows in Bendigo Creek exceed more than 50% of the natural flow plus the new primary allocation. 110 L/s has been chosen as the maximum supplementary allocation as this plus 50 L/s primary allocation is the maximum capacity of the water take infrastructure (160 L/s). This would provide critical additional water to assist the applicant in filling the Bendigo Station pond during times of high surface flows.

3. 179,473 m^3 maximum monthly volume. This is based on the Aqualinc efficient use calculations presented in Section 6.6, plus additional water needed for stock drinking and domestic use. It is

reiterated that there is less than 1 year of abstraction data recorded, and much of this occurred during comparatively wet irrigation seasons. It is therefore reasonable to assume that a more complete abstraction record would yield a volume at or above that applied for, particularly during drier seasons. It is also noted that the applicant proposes significant future expansion of irrigation areas, making the historic monthly abstraction volume less relevant.

4. 900,601 m^3 maximum annual volume. This is based on the Aqualinc efficient use calculations presented in Section 6.6, plus additional water needed for stock drinking, domestic use and pond level maintenance outside of the irrigation season.

Abstraction will occur year-round, with Bendigo Creek water used for stock drinking, domestic use and water harvesting outside the irrigation season.

3. DESCRIPTION OF EXISTING ENVIRONMENT

3.1 Land Use and Topography

Bendigo Station is situated on the lower flanks of the Dunstan Mountains and the terraces south of the lower Lindis River. Elevation varies from approximately 480 masl at the highest point of irrigation to approx. 300 masl close to Loop Road. The upper sections of the irrigated area are relatively steep and rugged, with mixed scrubland typifying those areas that have not already been converted to viticulture or pasture. The flats, which are given over to grazing for merino and cattle, are relatively fertile and produce good pasture when water is available.

Bendigo Station is a highly diversified enterprise, with activities on the property including merino farming, angus breeding cows, trading steers, finishing beef calves, and viticulture. Much of the land on the hillsides above the flats which would otherwise provide relatively poor grazing has or is being converted into world class vineyards.

Bendigo has a rich mining and farming history, with a large swathe of land to the south of the irrigation areas managed by Department of Conservation as historic recreation reserve. The applicant's Bendigo Creek intake is located within this conservation land, as shown in the below figure.

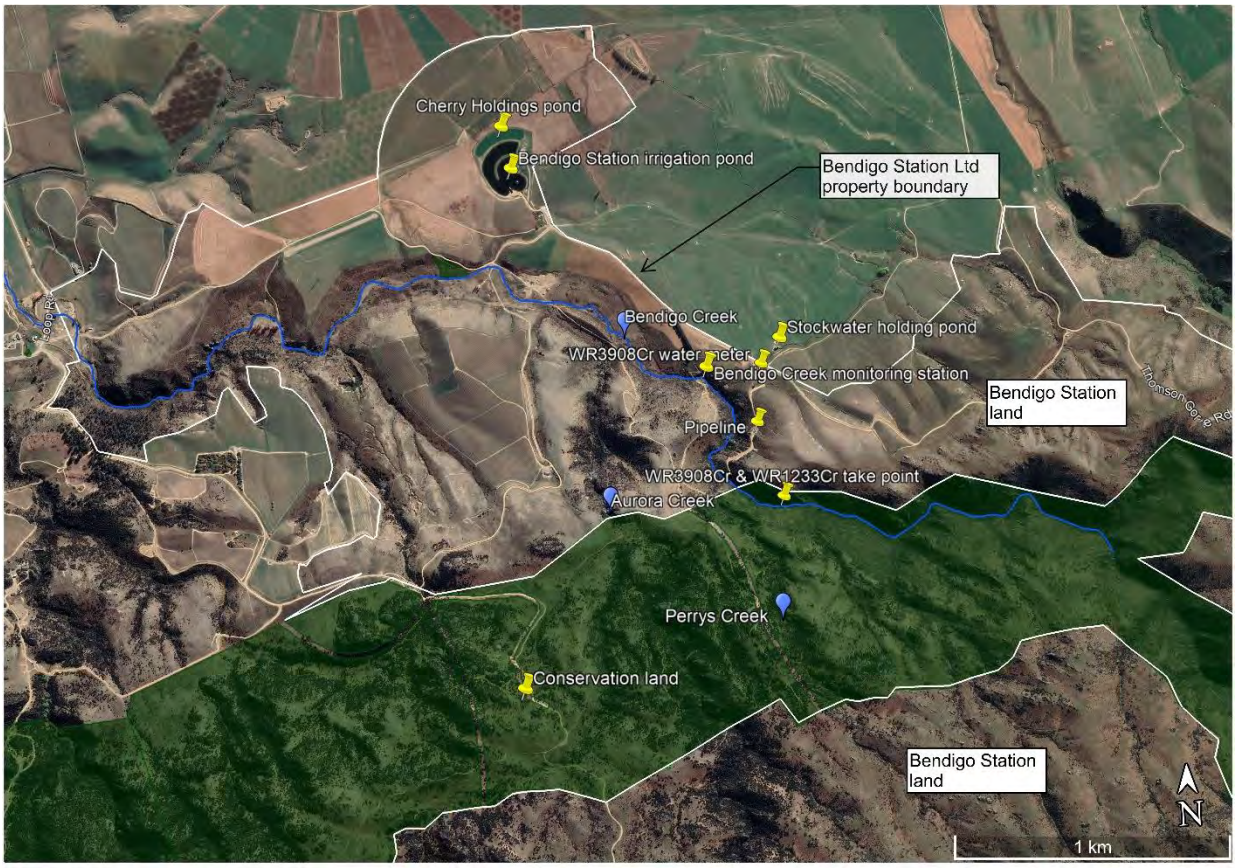


Figure 12: Bendigo Station Ltd property boundary in relation to conservation land

Vegetation in the vicinity of the abstraction point is generally comprised of Willows, exotic grasses and indigenous shrubs such as Hebe's, Coprosmas, and kanuka.

3.2 Climate

The climate of the Cromwell area can be described as a typical Central Otago semi-arid landscape, with long sunshine hours, low rainfall and high summer temperatures coupled with significant temperature inversions in winter.

The applicant's vineyard is located within the 450 mm/year Aqualinc rainfall class band.

3.3 Soils

SMap-designated soils (Landcare Research/Manaaki Whenua, 2019) are summarised in the below figure, a full-size copy of which is provided in Appendix A.

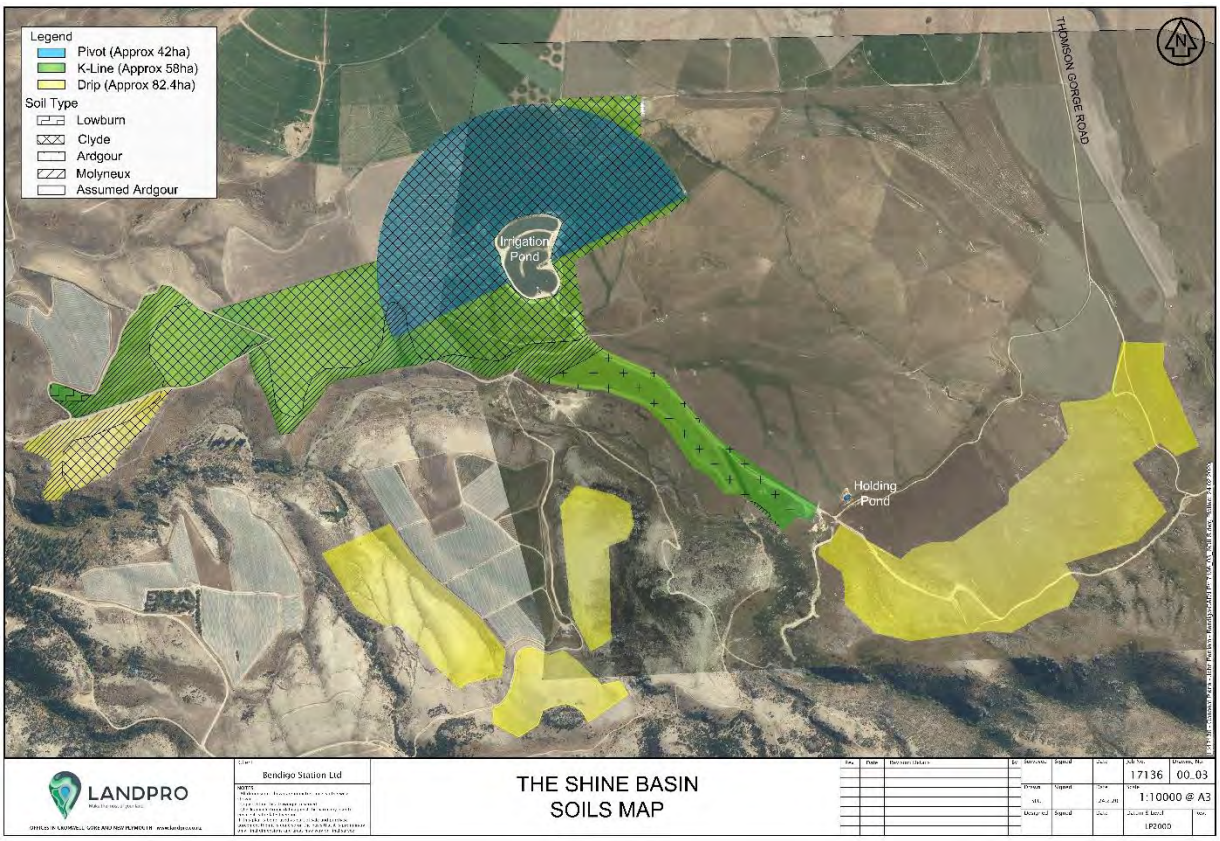


Figure 13: Soils underlying areas of Bendigo Station irrigated with Bendigo Creek water (Source: SMap Online)

Note that no soil information was available for the proposed vineyard locations, therefore soil for these areas was assumed to be Ardgour.

3.4 Bendigo Creek hydrology and ecology

3.4.1 Hydrology

The headwaters of Bendigo Creek begin towards the top of the Dunstan Mountains, at an elevation of approx. 1560 masl. The initial stretch of the creek is divided into two branches (Bendigo Creek Right Branch and Bendigo Creek Left Branch) which then join into one branch, after which the creek enters a moderately incised gorge. The applicant's intake is located towards the end of this gorge, with the creek flowing onto the flats and the channel opening out shortly thereafter.

Figure 14: Bendigo Creek looking upstream above the intake

Figure 15: Looking downstream from below applicant's Bendigo Creek intake

Figure 16: Looking past the applicant's Bendigo Creek pipeline towards the intake

Past this point, the Bendigo Creek channel meanders through the terraces prior to its confluence with the Clutha River. As will be discussed later, there is very rarely water in this channel past Loop Road, which is still over 3 km from the Clutha River.

There is no flow monitoring data for Bendigo Creek, however MfE flow modelling estimates the mean flow of Bendigo Creek in the vicinity of the intake to be 243 L/s and the mean annual low flow (MALF) to be 63 L/s. Conversations with the applicant and an assessment of Google Earth aerial imagery from 2019 to 2005 indicates that the creek is prone to drying up well before it's confluence with the Clutha River, with the aerial photography record showing the furthest wetted extent of the creek was approx. 400 m downstream of the Loop Road crossing, regardless of the time of year.

In order to better understand the losing nature of Bendigo Creek, Landpro undertook stream gauging on January 16th 2020 (see Appendix C). The applicant's abstraction from the creek was ceased 24 hours prior to the survey, to allow the creek to assume a naturalised flow. The below figure, extracted from the attached report, shows the survey locations and indicates that the creek dries up relatively quickly between Sites 3 and 4.

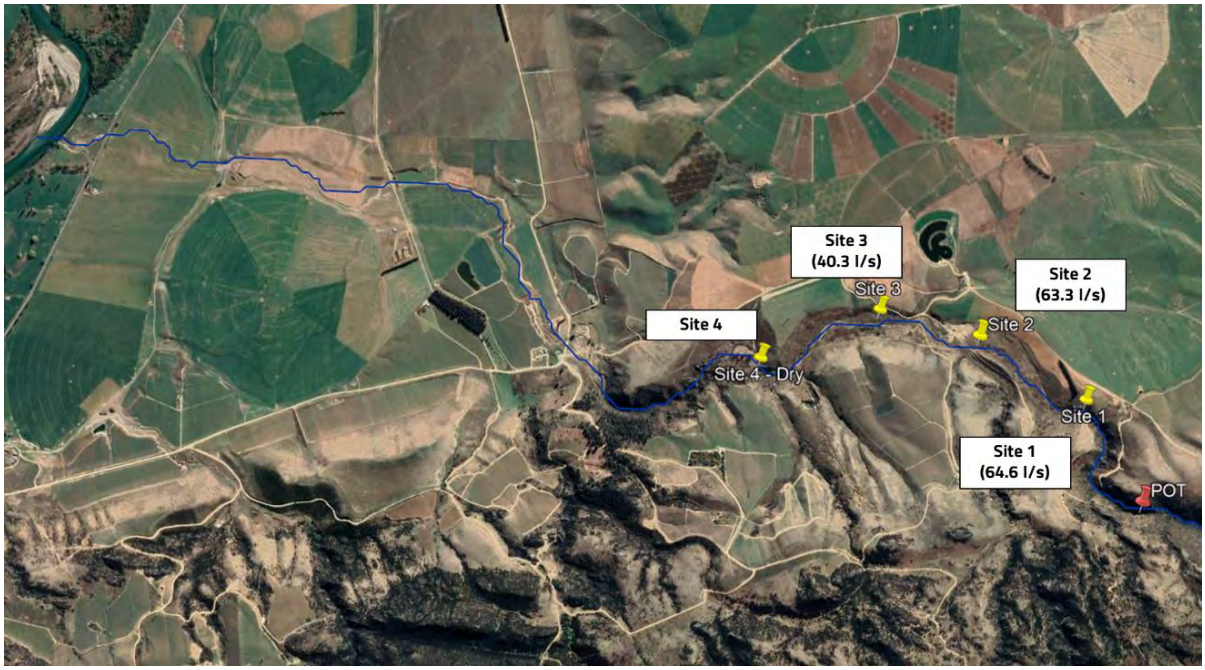


Figure 17: Location of Bendigo Creek gauging sites and corresponding flows measured. Site 4 was dry.

Note that no gauging was able to be undertaken above or at the point of take, due to the channel morphology and issues of inaccessibility.

The report notes the following:

Results of the flow gauging's undertaken suggest that flow downstream of the Bendigo Station Ltd abstraction point interact with the hyporheic zone and fine loose alluvial gravels, and that this provides a mechanism for water loss to the sub-surface zone. The survey identified a net loss of 64.6 L/s between the abstraction point, and a site located approx. 2km downstream (Figure 1) where Bendigo Creek ran dry at a gorge where the creek was constrained by bedrock and pools and dense vegetation.

This phenomenon has also been frequently observed in streams on the west side of the Clutha and Lake Dunstan, where surface flows are rapidly lost to ground when they pass from a loess or bedrock substrate to an alluvial substrate.

It can therefore be concluded that while the applicant's abstraction may shorten the wetted reach of Bendigo Creek, it does not have any significant effect on the creeks connectivity with the Clutha River (as the creek typically never flows its full length).

3.4.2 Bendigo Creek flow monitoring

In order to better understand the hydrology of Bendigo Creek and determine the effects of abstraction on the creek, the applicant voluntarily commissioned installation of a flow monitoring station on the watercourse. The meter was installed earlier this month (February 2020) and is now capturing data, however additional gauging is needed to calibrate the meter and ensure it is capturing reliable data.

While the initial intention was to install the meter above the abstraction point to provide naturalised flow data, the morphology of the channel above the intake did not permit this. As such, the meter was located approx. 700 m downstream from the intake, in a section of the creek that enables reliable data gathering, telemetry and relatively easy access for maintenance of the equipment. Note that there are no significant inputs into the creek between the abstraction point and the monitoring point.

It is intended that, in addition to developing a better understanding of the hydrology of Bendigo Creek, the meter can be used to inform any residual flow conditions imposed, along with supplementary allocation.

3.4.3 Ecology

There are no New Zealand Freshwater Fish Database (NZFFD) records for Bendigo Creek, therefore a fish survey of the creek was undertaken in December, 2019 by Water Ways Consulting Ltd (Appendix D). As part of the survey, 3 sites were electrofished upstream of the intake and 2 sites were electrofished downstream. The only fish encountered were found at the lowermost site (site 5): five brown trout, consisting of 4 fry hatched earlier in 2019 and 1 160mm individual.

According to the attached report, "*the overall fish density was very low and lack of larger adult fish indicates that this section of stream contains very few trout and the population consists of small brown trout.*"

Larval galaxiid surveys at Sites 3, 4 and 5 saw no larval galaxiids. Given the lack of any adult galaxiids at any of the survey sites, even when no salmonids were present, this indicates that Bendigo Creek is unlikely to contain the rare Clutha flathead, and there is certainly no evidence it is present at the water take or downstream of that point.

The lack of fish at the upstream Sites 2 to 4 indicates there is a barrier to fish movement from the lower reaches at Site 5 to Sites 3 and 4. The reach in between Sites 4 and 5 is steep and bedrock bluffs are common (Figure 6). It is expected in this reach there is a waterfall barrier or barriers that prevent upstream fish movement.

3.4.4 Schedule 1 values

Bendigo Creek is not listed in Schedule 1 of the RPW.

4. ACTIVITY CLASSIFICATION

This application seeks to replace existing water permits that have primary allocation status. Replacement of WR3908Cr and WR1233Cr as part of the proposal is authorised by Rule 12.1.4.5 of the RPW:

Rule 12.1.4.5
Taking and use of surface water as primary allocation applied for prior to 28 February 1998 in catchments not listed in Schedule 2A:

- *(i) This rule applies to the taking of surface water, as primary allocation, in catchment areas not listed in Schedule 2A, if the taking was the subject of a resource consent or other authority:*
  - *(a) Granted before 28 February 1998; or*
  - *(b) Granted after 28 February 1998, but was applied for prior to 28 February 1998; or.*

(c) *Granted to replace a resource consent or authority of the kind referred to in paragraph (a) or (b).*

(ii) *Unless covered by Rule 12.1.1A.1, the taking and use of surface water to which this rule applies is a* ***restricted discretionary*** *activity. The matters to which the Otago Regional Council has restricted the exercise of its discretion are set out in Rule 12.1.4.8.*

(iii) *Unless covered by Rule 12.1.1A.1, the taking and use of surface water in the Waitaki catchment to which this rule applies is a restricted discretionary activity provided that by itself or in combination with any other take, use, dam, or diversions, the sum of the annual volumes authorised by resource consent, does not exceed the allocation to activities set out in Table 12.1.4.2. The matters to which the Otago Regional Council has restricted the exercise of its discretion are set out in Rule 12.1.4.8.*

(iv) *Takes to which this rule applies will not be subject to a minimum flow condition until the minimum flow has been determined by investigation and added to Schedule 2A by a plan change. Note: If a minimum flow has been determined for a catchment previously not listed in Schedule 2A, and that minimum flow has been set by a plan change, the catchment will then be listed in Schedule 2A and Rule 12.1.4.2 or Rule 12.1.4.4 will apply.*

Rule 12.1.4.8 Restricted discretionary activity considerations

In considering any resource consent for the taking and use of water in terms of Rules 12.1.4.2 to 12.1.4.7 and 12.2.3.1A, the Otago Regional Council will restrict the exercise of its discretion to the following:

(i) *The primary and supplementary allocation limits for the catchment; and*

(ii) *Whether the proposed take is primary or supplementary allocation for the catchment; and*

(iii) *The rate, volume, timing and frequency of water to be taken and used; and*

(iv) *The proposed methods of take, delivery and application of the water taken; and*

(v) *The source of water available to be taken; and*

(vi) *The location of the use of the water, when it will be taken out of a local catchment; and*

(vii) *Competing lawful local demand for that water; and*

(viii) *The minimum flow to be applied to the take of water, if consent is granted; and*

(ix) *Where the minimum flow is to be measured, if consent is granted; and*

(x) *The consent being exercised or suspended in accordance with any Council approved rationing regime; and*

(xi) *Any need for a residual flow at the point of take; and*

(xii) *Any need to prevent fish entering the intake and to locate new points of take to avoid adverse effects on fish spawning sites; and*

(xiii) *Any effect on any Regionally Significant Wetland or on any regionally significant wetland value; and*

(xiv) *Any financial contribution for regionally significant wetland values or Regionally Significant Wetlands that are adversely affected; and*

(xv) *Any actual or potential effects on any groundwater body; and*

(xvi) *Any adverse effect on any lawful take of water, if consent is granted, including potential bore interference; and*

(xvii) *Whether the taking of water under a water permit should be restricted to allow the exercise of another water permit; and*

(xviii) *Any arrangement for cooperation with other takers or users; and*

(xix) *Any water storage facility available for the water taken, and its capacity; and*

(xx) *The duration of the resource consent; and*

(xxi) The information, monitoring and metering requirements; and

(xxii) Any bond; and

(xxiii) The review of conditions of the resource consent; and

(xxiv) For resource consents in the Waitaki catchment the matters in (i) to (xxiii) above, as well as matters in Policies 6.6A.1 to 6.6A.6.

Notification and written approvals

(a) For applications for resource consent to which this Rule applies, to take and use water from a river, the Consent Authority is precluded from giving public notification, if the application is to take and use water from:

(i) A river for which a minimum flow has been set by or under this Plan; or

(ii) A river for which it is not necessary for the Council to consider whether, if consent is granted, the taking should be subject to a condition requiring a residual flow to remain in the river at the point of take, or a condition requiring other provision for native fish, other than a condition requiring fish screening.

Other applications for resource consent to take and use water from a river may be considered without notification as allowed by the Resource Management Act.

(b) For applications for resource consent to which this rule applies, to take and use water from a water body other than a river, the Consent Authority is precluded from giving public notification.

All water sought as replacement for the applicant's deemed permits (WR3908Cr & WR1233Cr) is the same or less than that applied for prior to 28 February 1998, as per Rule 12.1.4.5(i)(a). Bendigo Creek is not listed in Schedule 2A of the RPW. This means these deemed permit replacements are **restricted discretionary** activities.

The applicant is also seeking supplementary allocation from Bendigo Creek to enable water harvesting during times of high flow, which would be considered a restricted discretionary activity under Rule 12.1.4.7(iii) of the RPW:

12.1.4.7 Taking and use of surface water as supplementary allocation in any catchment other than a Schedule 2B catchment:

(iii) The taking of surface water as supplementary allocation for any catchment is subject to a minimum flow which is not less than either:

(a) 50% of the natural flow at the point of take, or, if a resource consent so provides, not less than 50% of the natural flow at a point specified in the resource consent; or

(b) The natural mean flow at the point of take, or, if a resource consent so provides, not less than the natural mean flow at a point specified in the resource consent

*(iv) Unless covered by Rule 12.1.1A.1, the taking and use of surface water to which this rule applies is a **restricted discretionary** activity, and is subject to Rule 12.1.4.9. The matters to which the Otago Regional*

Council has restricted the exercise of its discretion are set out in Rule 12.1.4.8.

4.1 Other Activities

The applicant may, at times, need to conduct maintenance to the Bendigo Creek intake infrastructure. This will involve instream works, and is a permitted activity under Rule 13.5.1 of the RPW:

The disturbance of any lake or river…and any resulting discharge or deposition of bed material associated with: (iii) The maintenance or reinstatement of a water intake, in order to enable the exercise of a lawful take of water…is a ***permitted activity.***

All conditions of this rule will be adhered to, including the notification of DoC and Fish and Game (F&G) in advance of any instream works between 1 May and 30 September.

The applicant also uses Bendigo Creek water for stock drinking purposes. This is in accordance with the provisions of Section 14 of the RMA, permitting the take and use of water for the reasonable needs of an individual's animals for drinking water. Applicable calculations relating to the amount of stock water required are provided in Section 6.6.

The Bendigo Station pond is not located in any current or former watercourse, therefore it is not subject to the rules of the RPW. It is also not considered a "large dam" under the Building Act.

Finally, discharge of water to water occurs from the Bendigo Station pond overflow back to Bendigo Creek. This is a permitted activity under Rule 12.C.1.1 of the RPW:

The discharge of water or any contaminant to water, or onto or into land in circumstances which may result in a contaminant entering water, is a permitted activity.

None of the provisions that might confound the permitted status of this activity (i.e. causing flooding, discharge between catchments, etc.) is triggered by the discharge.

5. NON-NOTIFICATION & CONSULTATION

A consent authority has the discretion whether to publicly notify an application unless a rule or National Environmental Standard (NES) precludes public notification (in which case the consent authority must not publicly notify) or section 95A(2) applies.

The effects of the activity will be no more than minor, the applicant does not request public notification and there are no rules or NES' which require the public notification of the application. In addition, there are no special circumstances relating to the application. As such, notification of the application is not necessary.

Clause 6(1)(f) of Schedule 4 of the RMA requires the identification of, and any consultation undertaken with, persons affected by the activity. Given that there are no other legal water takes on Bendigo Creek, and

considering that the applicant owns or manages most of the land encompassing this catchment, it is reasonable to conclude that no persons will be adversely affected by the proposal (per Section 6 below).

Due to the presence of sportfish in Bendigo Creek, Fish & Game (F&G) may be considered affected by the proposal. However, due consideration should be given to the ecological assessment conducted by Water Ways Consulting Ltd in December 2019, as discussed in Section 3.4.3 and attached in Appendix D:

- No species other than brown trout were identified across 5 survey sites in the creek.
- Brown trout were found only at Site 5, well downstream of the abstraction point.
- Brown trout density was "very low", with a lack of large adult fish indicating that Bendigo Creek provides poor trout habitat.

Also worth considering is the typical lack of connectivity between Bendigo Creek surface flows and the Clutha River. Analysis of historic aerial imagery between 2005 and 2019, along with the results from the January 2020 gauging, indicates that the creek dries up an average of 4.5 km from its confluence with the Clutha River. This is irrespective of season or whether abstraction is occurring or not.

For all of these reasons, Bendigo Creek does not provide significant spawning or rearing habitat for sportfish.

Also worth noting is the lack of indigenous fish species in the creek. No indigenous species were identified during the surveys, and there was no sign of galaxiid larvae either upstream or downstream of the take point.

Overall, it is considered that this application will be processed non-notified. Iwi are considered to be affected by the proposal due to their interest in Otago water, however the F&G and DoC are considered to be interested only. The proposal will not adversely affect instream values under the existing environment, given that there is a proposed reduction in allocation.

6. ASSESSMENT OF ENVIRONMENTAL EFFECTS

In addition to the application being made in the prescribed forms and manner, Section 88 of the RMA also requires that every application for consent includes an assessment of the effects of the activity on the environment as set-out in Schedule 4 of the RMA.

6.1 Assessment of Alternatives

Other than Bendigo Creek water, the only other viable source of water for the study area is groundwater. Accessing groundwater is a very costly process, however, with a high chance of failure. This would also require a power supply to the bore or bores in question, along with establishing new meters and pipelines – all of which take time and money.

The Bendigo Creek take, on the other hand, is long established and gravity-fed, negating any requirements for electrical connections. The applicant has also invested considerable money in installing a new, more use-efficient, intake on Bendigo Creek, along with several kilometres of pipeline. For this reason, Bendigo Creek represents the most practical and efficient source of water for irrigation, stock drinking and domestic use within the study area.

6.2 Effects on hydrology and ecology

Following the suite of recent surveys in Bendigo Creek, both the hydrology and ecology of the creek are relatively well understood. From a hydrological perspective, an initial aerial photo desktop study revealed that, over the last 15 years, there is no record of the creek ever having run its full length to the Clutha River – regardless of season or abstraction. Gauging was then undertaken this year, during summer low flow conditions, to quantify the losing nature of the creek. It was shown through the gauging that, even when abstraction is ceased, the creek loses surface flows very rapidly as it flows across underlying alluvium.

Thus while abstraction during low flows would shorten the wetted reach of the creek somewhat, the hydrological implications of this shortening would still be considered insignificant. Abstraction does not curb the natural cycles of the creek, meaning it's inherent character is maintained, and the creek is always permitted to flow well past the point of take (≥1.4 km downstream of the intake, based on the photographic record).

With regards to fish values, the recent fish survey completed by Water Ways Consulting Ltd showed that the only fish present are a small, stunted population of brown trout. Additionally, the habitat provided for these trout is relatively poor, given the creek's natural tendency to run dry and the presence of didymo. Thus maintaining the status quo in terms of abstraction should enable preservation of the trout present while enabling the applicant to continue meeting their efficient irrigation needs.

Given that there appear to be no other fish species present, there is no requirement for the applicant to provide additional mitigation. In the unlikely event that galaxiids were present upstream of the intake, abstraction under the status quo would have no foreseeable impact on these populations.

For the above reasons, no fish screen is considered necessary on the intake.

Invertebrate values are not likely to be adversely affected by the activity.

6.3 Residual flow

Water Ways Ltd's fish survey report provided residual flow recommendations based on the findings, as follows:

There is no fish population present at the take point and the brown trout population present in Bendigo Creek is limited to a reach below the gorge observed downstream of Site 4 to the drying reach observed at Loop Road. The

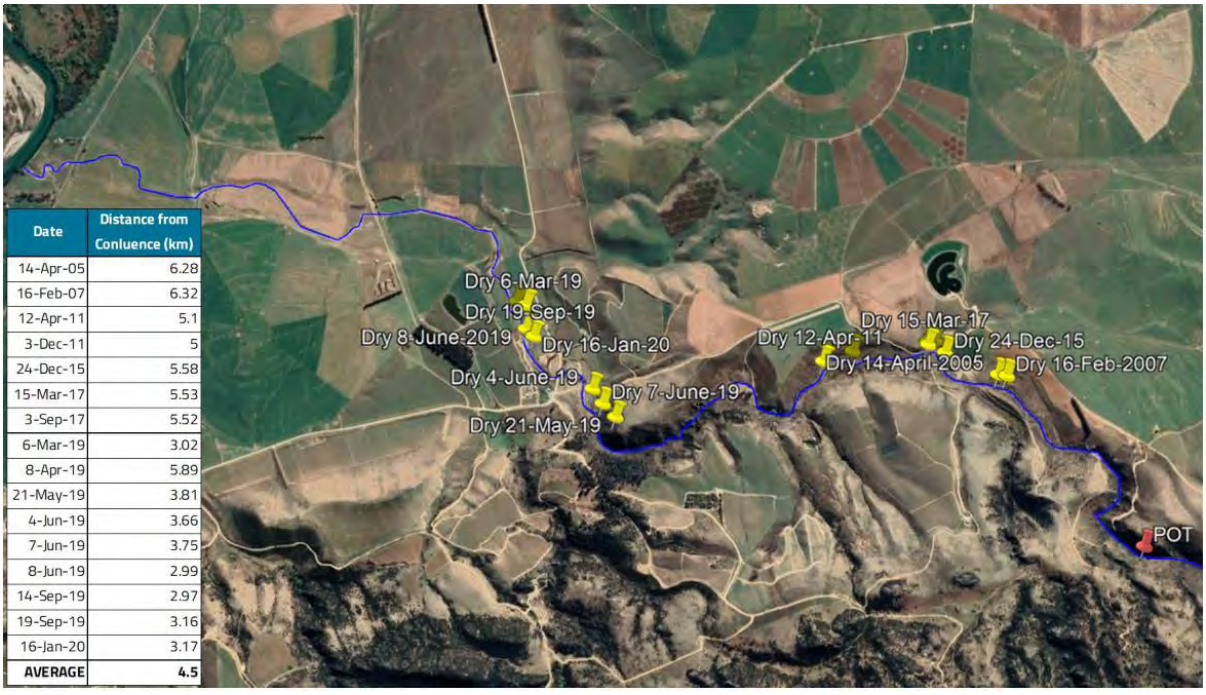
trout population sampled also indicates that Site 5 provides poor trout habitat and it is possible during summer low flow this site has little useable habitat. The presence of didymo at Site 5 also adds to the site degradation as didymo infestations also reduce the quality of macroinvertebrate communities. It was also notable that a dry reach was present in Bendigo Creek at Loop Road and the lack of flow in this area indicates a substantial flow is required to provide connectivity with the Clutha River. It is possible that this reach dries naturally during summer low flows.

At the point of take the intake structure does not collect all the water present in the stream and a smaller flow was maintained downstream of the take point (at Site 4). This provides habitat for macroinvertebrates and maintains flow connectivity through the abstraction point. Therefore, a residual flow is recommended for the water take that maintains a continuous flow through the abstraction site, as is currently provided via leakage through the intake weir.

In short, the report noted that the intake does not take all of the flow from the creek regardless of how low those flows are, and recommended that maintenance of the status quo was sufficient to preserve the limited instream values present.

However, in the unlikely event that stakeholders were to raise concerns about the abstraction potentially compromising the degraded downstream trout habitat, the applicant would be willing to enter into discussions regarding the imposition of a quantifiable residual flow (as determined by the newly installed meter downstream of the take) past the abstraction point. Based on the ecological report referenced above, however, this is not considered necessary at present.

Finally, as the below image shows, there is no record over the past 15 years of the abstraction ever having dried up the creek entirely past the intake. This means that, even without a quantifiable residual flow imposed, there would always be some fish and macroinvertebrate habitat provided past the take point.



Date	Distance from Confluence (km)
14-Apr-05	6.28
16-Feb-07	6.32
12-Apr-11	5.1
3-Dec-11	5
24-Dec-15	5.58
15-Mar-17	5.53
3-Sep-17	5.52
6-Mar-19	3.02
8-Apr-19	5.89
21-May-19	3.81
4-Jun-19	3.66
7-Jun-19	3.75
8-Jun-19	2.99
14-Sep-19	2.97
19-Sep-19	3.16
16-Jan-20	3.17
AVERAGE	**4.5**

Figure 18: Locations where Bendigo Creek has historically run dry as determined by historic aerial imagery from Google Earth (Source: Landpro, 2020)

6.4 Effects on other water users

There are no other legal water users of Bendigo Creek water, and virtually all of the property through which the creek flows is owned by the applicant. For this reason, there would be no effect on legal water users of Bendigo Creek.

Additionally, given that most of the creek bed is located on private land, the fact that the creek rarely has running water past Loop Road, and the degraded trout population present, there would be no effects on recreational water users due to the activity.

6.5 Available water allocation

Policy 6.4.2 of the RPW defines the primary allocation limit for each catchment:

> *To define the primary allocation limit for each catchment, from which surface water takes and connected groundwater takes may be granted, as the greater of:*
>
> *(a) That specified in Schedule 2A, but where no limit is specified in Schedule 2A, 50% of the 7-day mean annual low flow; or*
>
> *(b)* ***The sum of consented maximum instantaneous, or consented 7-day, takes of:***
>
> *(i)* ***Surface water as at:***
>
> *(1) 19 February 2005 in the Welcome Creek catchment; or*
>
> *(2) 7 July 2000 in the Waianakarua catchment; or*
>
> *(3)* ***28 February 1998 in any other catchment****; and*
>
> *(ii) Connected groundwater as at 10 April 2010,*
>
> *less any quantity in a consent where:*
>
> *(1) In a catchment in Schedule 2A, the consent has a minimum flow that was set higher than that required by Schedule 2A.*
>
> *(2) All of the water taken is immediately returned to the source water body.*
>
> *(3) All of the water being taken had been delivered to the source water body for the purpose of that subsequent take.*
>
> *(4) The consent has been surrendered or has expired (except for the quantity granted to the existing consent holder in a new consent).*
>
> *(5) The consent has been cancelled (except where the quantity has been transferred to a new consent under Section 136(5)).*
>
> *(6) The consent has lapsed.*

This proposal seeks to take water from Bendigo Creek that is within the allocation limit as defined by Policy 6.4.2(b)(i)(3), as no more water than was consented on 28 February 1998 is being sought for replacement of Deemed Permits WR3908Cr and WR1233Cr.

6.6 Efficiency of use

An assessment of reasonable irrigation demand has been undertaken for the total area irrigated by Bendigo Creek water in accordance with Aqualinc 2017[1] guidelines, which involved determining soil types within the irrigated areas of the properties via Landcare Research's S-Map[2] online tool. The soil types encompassed within the command area are presented in Figure 13 of this report, a larger copy of which is provided in Appendix A. Aqualinc was then used in conjunction with ORC MAR data to determine the peak daily, monthly and annual irrigation demand.

Table 4 provides a summary of the Aqualinc outputs. Full Aqualinc calculations are provided in Appendix E.

Table 4: Aqualinc modelled application requirements for existing and future irrigated areas of Bendigo Station Ltd, compared to total existing paper allocation from Bendigo Creek

Volume	Daily (m^3)	Monthly (m^3)	Annual (m^3)
Current total paper allocation	7,200[3]	219,000[4]	2,628,000
Required (per Aqualinc calcs)	5,672	176,325	836,969 (90% ile)
Stock drinking requirements[5]	103	3,118	37,413
Domestic requirements[6]	1	30	365
Pond maintenance requirements[7]	-	-	25,854
Volume sought	**-**	**179,473**	**900,601**

As the above table shows, considerably less monthly and annual allocation is being sought than the current paper allocation. The annual volume is in line with Policies 6.4.0A and 6.4.2A of the RPW, which respectively require an application to prove efficiency of water use and seek the same or less water than has been taken over the past 5 or more years. While the monthly volume sought does not align with Policy 6.4.2A at first glance, it is not considered to be in direct contravention of the policy for reasons explained at the end of Section 2.3. The monthly volume sought is also based on efficient use calculations.

Stock drinking requirements are in addition to the allocation sought for irrigation, as the RMA does not place a limit on water taken for an animal's drinking needs:

> *14(3)(b)(ii) A person is not prohibited by subsection (2) from taking, using…any water…if…the water…is*

[1] McIndoe I, Brown P, Rajanayaka C, KC. B, 2017. Guidelines for Reasonable Irrigation Water Requirements in the Otago Region. Otago Regional Council, 2. Aqualinc Research Limited.

[2] https://smap.landcareresearch.co.nz/app

[3] Based on 300,000 L/hour combined limit for Deemed Permits WR1233Cr & WR3908Cr.

[4] No monthly or annual limit is specified on the current permits – these figures have been calculated based on the specified hourly rate.

[5] Based on 11,500 sheep @ 5 L/head/day & 1000 beef cattle @ 45 L/head/day (at peak capacity)

[6] For 1 house, based on 4-person household @ 250 L/person/day

[7] Calculated for 5 months outside the irrigation season (April 15-September 15). Seepage losses with a clay liner would average 4.5 mm/day (0.0045 m/day) while evaporation from the ~23,000 m^2 pond surface area may average ~2 cm/week (0.0029 m/day). Potential water loss = (0.0045+0.0029)*23,000 = 170 m^3/day (~2 L/s). Total potential pond loss outside irrigation season = 152 days x 170 m^3/day =

required to be taken or used for….the reasonable needs of a person's animals for drinking water.

The Bendigo Station pond not only provides storage for irrigation in the summer, it also provides significant aesthetic/amenity value to the area. There is a new house situated on piles above this pond, and the house would lose much of its appeal were the pond to dry up or drop during the winter. An additional volume has been calculated for maintaining water levels in the pond outside the irrigation season (May-August), to ensure the applicant has sufficient allocation to keep the pond filled (amenity value) and prevent cracking of the pond liner (structural necessity). This volume equates to approximately 2 L/s across 5 months.

6.7 Effects on cultural values

While Bendigo Creek is not identified in Schedule 1D of the RPW, it is recognised that this creek may still have some cultural significance and every effort has been made to preserve the watercourse in light of these values. In particular, iwi values as they relate to Bendigo Creek and this application have been addressed in Section 7.2.6.

6.8 Effects on groundwater

There are no designated aquifers within the study area, with the closest aquifer being the Lindis Alluvial Ribbon Aquifer approximately 4.7 km to the north of the take point. No effects of the activity on this aquifer are anticipated, given the distance.

To our knowledge, the closest neighbouring groundwater take to the applicant's Bendigo Creek take point is RM20.016.01 (Peregrine Estate Limited), approximately 3.7 km to the northwest. Due to the considerable buffer zone around the take point, the abstraction will not have an adverse effect on neighbouring groundwater users.

No adverse effects on underlying groundwater resources, such as aquifer compaction or degraded groundwater quality, are expected as a result of the proposal.

6.9 Effects relating to proposed supplementary allocation

As discussed in Section 2.3, the applicant proposes a supplementary rate of take of up to 110 L/s in order to assist them in filling their storage pond during times of high flow. This may present environmental impacts to the creek and wider catchment that have not been encompassed within the above AEE, which is based on abstraction under what is essentially the status quo. As such, an additional assessment of effects as it relates to the proposed supplementary allocation is provided below.

6.9.1 Effects on hydrology and ecology

Taking an additional 110 L/s from Bendigo Creek as supplementary allocation would only have minor effects on the ecology of the creek, due to the fact that this would generally only be during the spring snowmelt of

rainfall events. During these events, upstream fish passage would likely be difficult due to higher velocities. Furthermore, it has already been determined above that the fish values in Bendigo Creek are limited to a small stunted population of brown trout, and it is not envisaged that this population would be adversely impacted by the applicant abstracting water during times of high flows in the creek.

Some effects to the downstream hydrology of Bendigo Creek would be possible due to the greater rate of take, however it should again be noted that this would likely only occur during shorter duration rainfall or snowmelt events, and the 160 L/s (50 L/s primary + 110 L/s supplementary) cap would ensure that the natural hydrograph of the creek would remain largely unchanged.

6.9.2 Effects on other water users

As discussed earlier, there are no other legal water users on Bendigo Creek, and the catchment is largely unsuitable for recreation.

6.9.3 Available water allocation

Bendigo Creek is not listed in Schedule 2B, therefore supplementary allocation is limited to that specified in Policy 6.4.9(a) – i.e. anything over 50% of the natural instream flow. The natural instream flow can be determined in real time via the newly installed water monitoring station on the creek, meaning the applicant can always ensure that the amount of water abstracted does not lower creek flows below 50% of the natural level.

6.9.4 Efficiency of use

No additional monthly or annual water is being sought above what has been calculated to be efficient in Section 6.6.

6.10 Monitoring

The existing Bendigo Creek take will continue to be metered and reported as per the current arrangement. The new Bendigo Creek meter will be used by the applicant to guide supplementary abstraction, and creek flow data can be made available to Council upon request.

6.11 Positive effects

The positive effects of the proposal are numerous, and include:

- Ongoing operation of a large, productive beef and merino farm that contributes to both the local and regional economy. Much of this operation would not be possible without a secure source of water.
- Irrigation opportunities for proposed expansion of vineyard areas. The existing vineyards at Bendigo are now recognised as world class vineyards in their own rights, as the substrate, aspect and climate is prime land for grape growing. Providing sufficient Bendigo Creek water will enable the applicant

to convert more marginal land into world class vineyard, thereby improving land value and, arguably, aesthetics.

- Lower energy consumption. Because the take and water conveyance are gravity-fed, energy consumption can be kept to a minimum. This ensures the operation is more sustainable.

6.12 Proposed consent conditions

- Purpose: to take water as primary and supplementary allocation from Bendigo Creek for irrigation, stock drinking and domestic use.
- Location: Bendigo Creek, approximately 6.2 km east of the intersection of Loop Road and Tarras-Cromwell Road.
- Legal description of land at point of take: Section 21 SO 24641
- Map reference: NZTM2000 1314483E 5018116N
- This permit shall not commence until Deemed Permits WR3908Cr and WR1233Cr have expired or been surrendered.
- The primary rate of take shall not exceed 50 L/s.
- The supplementary rate of take shall not exceed 110 L/s.
- Supplementary abstraction shall only occur when the Bendigo Creek naturalised flow exceeds 50% of the naturalised flow plus the primary rate of take of 50 L/s, and will not cause the flow in the creek to fall below this level.
- The volume of water taken under this consent shall not exceed:
    - 179,473 m^3/month
    - 900,601 m^3/year
- The Consent Holder shall maintain a water meter to record the water take, at or close to the point of take, within an error accuracy of +/- 5% over the meter's nominal flow range, and a telemetry compatible datalogger with at least 24 months data storage and a telemetry unit to record the rate and volume of take, and the date and time this water was taken. The datalogger shall record the date, time and flow in L/s. Data shall be provided to the Consent Authority by means of telemetry. The consent holder shall ensure data compatibility with the Consent Authority's time-series database. The water meter shall be installed according to the manufacturer's specifications and instructions. There shall be enough space in the pipe/flume to allow for verification of the accuracy of the meter under Condition (X).
- The Consent Holder shall ensure the full operation of the water meter, data logger and telemetry unit at all times during the exercise of this consent. All malfunctions of the water meter and/or datalogger during the exercise of this consent shall be reported to the Consent Authority within 5 working days of observation and appropriate repairs shall be performed within 5 working days. Once the malfunction has been remedied, a Water Measuring Device Verification Form completed with photographic evidence must be submitted to the Consent Authority within 5 working days of the completion of repairs.

- If a mechanical insert water meter is installed it shall be verified for accuracy each and every year from the first exercise of this consent. An electromagnetic or ultrasonic flow meter shall be verified for accuracy every 5 years from the first exercise of this consent. Each verification shall be undertaken by a Consent Authority approved operator and a Water Measuring Device Verification Form shall be provided to the Consent Authority within 5 days of the verification being performed, and at any time upon request.
- The consent holder shall take all practicable steps to ensure that:
    - There is no leakage from pipes and structures;
    - The use of water is confined to the target areas.
- The Consent Authority may, in accordance with Sections 128 and 129 of the RMA 1991, serve notice on the consent holder of its intention to review the conditions of this consent within 3 months of each anniversary of the commencement of this consent for the purpose of:
    - Adjusting the consented rate or volume of water under Conditions X and X, should monitoring under Condition X or future changes in water use indicate that the consented rate or volume is not able to be fully utilised; or
    - Determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or
    - Ensuring the conditions of this consent are consistent with any NES, relevant plans and/or the Otago RPS; or
    - Adjusting or altering the method of water take data recording and transmission.

7. 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.

7.1 **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 Bendigo Creek's ability to meet the reasonably foreseeable needs of future generations, or on the life-supporting capacity Bendigo Creek and any ecosystems associated with it. 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, intrinsic values of ecosystems, and the maintenance and enhancement of the quality of the environment. 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 and the proposed mitigation.

7.2 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. In 2015, however, ORC released the Proposed Regional Policy Statement for Otago and subsequently released the Partially Operative Regional Policy Statement for Otago earlier last year (2019). As the RPW does not reflect these latest versions of the RPS, consideration of these two documents has been provided below.

Additionally, for the sake of completeness, the National Policy Statement for Freshwater Management and Resource Management (Measurement and Reporting of Water Takes) Regulations have also been considered below.

7.2.1 National Policy Statement for Freshwater Management

The National Policy Statement for Freshwater Management 2014 (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 policies, which give effect to the NPS's objectives, are of most relevance to this application for resource consent.

Policy B5

By every regional council ensuring that no decision will likely result in future over-allocation – including managing fresh water so that the aggregate of all amounts of fresh water in a freshwater management unit that are authorised to be taken, used, dammed or diverted does not over-allocate the water in the freshwater management unit.

Policy B6

By every regional council setting a defined timeframe and methods in regional plans by which overallocation must be phased out, including by reviewing water permits and consents to help ensure the total amount of water allocated in the freshwater management unit is reduced to the level set to give effect to Policy B1.

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.

With regards to Policies B5 and B6, the proposal sees a significant reduction in the current level of allocation for Bendigo Creek, from an instantaneous, monthly and annual standpoint. The water sought from Bendigo Creek is within the allocation limits defined by Policy 6.4.2 of the RPW.

The proposed supplementary allocation of up to 110 L/s is also consistent with Policies B5 and B6, and within allocation limits defined by Policy 6.4.9(a) of the RWP.

With regards to Policy B8, the proposal will enable the applicant to provide for their economic well-being through maintenance of year-round pastures and establishment of new vineyards.

Council considers that the current and proposed policies in the RPS and RPW generally meet the requirements of the NPS. Consideration of these documents in light of the activities proposed is given further below.

7.2.2 Resource Management (Measurement and Reporting of Water Takes) Regulations

Section 4(1) of the Regulations states that "These regulations apply only to a water permit that allows fresh water to be taken at a rate of 5 litres/second or more." Because the proposed take is greater than 5 L/s, the activity must be in accordance with the Regulations. Specifically, the Regulations require the following:

- That the permit holder "keep records that provide a continuous measurement of the water taken under a water permit, including water taken in excess of what the permit allows." As a minimum, this typically means taking measurements of the volume of water taken each day.
- The water measurement device must be verified as accurate by a suitably qualified person:
    - Before the end of a permit's first water year; and
    - Every 5 years thereafter.
- The permit holder must provide records that cover each water year of the permit to the regional council that granted the permit, no later than 1 month after the end of the water year.

- The regional council that granted a water permit may, at its discretion, grant approval to the permit holder to keep records using a device or system that is installed as near as practicable to the location from which water is taken under the permit (instead of at that location).

The proposal is consistent with the requirements of the Regulations, with the applicant's abstraction record indicating ongoing adherence to the Regulations with no proposed change to this system of water measurement and reporting.

7.2.3 Partially Operative Regional Policy Statement for Otago

The following policies from the 2019 Partially Operative Regional Policy Statement are relevant to this application. Policies in this version of the plan (January 2019, updated March 2019) that have not yet been made operative have been omitted.

Table 5: Relevant policies from the Partially Operative Regional Policy Statement for Otago, 2019

Policy		Comments
2.2.1	*Manage the natural environment to support Kāi Tahu wellbeing by all of the following:* *a) Recognising and providing for their customary uses and cultural values in Schedules 1A and B; and* *b) Safe-guarding the life-supporting capacity of natural resources.*	As no increase in the primary rate of take is proposed, the life-supporting capacity of the catchment will be safeguarded. In general, it is envisaged that Kāi Tahu values, as detailed in Schedule 1A, will be protected and potentially enhanced as a result of the proposal. No Schedule 1B sites are located within the study area.
3.1.1	*Safeguard the life-supporting capacity of fresh water and manage fresh water to:* *a) Maintain good quality water and enhance water quality where it is degraded, including for:* *i. Important recreation values, including contact recreation; and, ii. Existing drinking and stock water supplies;* *b) Maintain or enhance aquatic:* *i. Ecosystem health;* *ii. Indigenous habitats; and,* *iii. Indigenous species and their migratory patterns.* *c) Avoid aquifer compaction and seawater intrusion;* *d) Maintain or enhance, as far as practicable:* *i. Natural functioning of rivers, lakes, and wetlands, their riparian margins, and aquifers;* *ii. Coastal values supported by fresh water;*	The ecological and hydrological features of Bendigo Creek are discussed in Section 3.4, while the potential effects on these features are discussed in Section 6.2. Water quality is unlikely to be affected by the activities. Kāi Tahu and other cultural values have been assessed above and in Section 7.2.6 of this document. Recreational values are addressed in Section 6.4, aesthetic and landscape values will be unaffected by the proposal, and no flooding, erosion, or other natural hazards will be caused or exacerbated by the activity.

iii. The habitat of trout and salmon unless detrimental to indigenous biological diversity; and *iv. Amenity and landscape values of rivers, lakes, and wetlands;* *e) Control the adverse effects of pest species, prevent their introduction and reduce their spread;* *f) Avoid, remedy or mitigate the adverse effects of natural hazards, including flooding and erosion; and, g) Avoid, remedy or mitigate adverse effects on existing infrastructure that is reliant on fresh water.*	
3.1.2 Manage the beds of rivers, lakes, wetlands, their margins, and riparian vegetation to: *a) Safeguard the life supporting capacity of fresh water;* *b) Maintain good quality water, or enhance it where it has been degraded;* *c) Maintain or enhance bank stability;* *d)Maintain or enhance ecosystem health and indigenous biological diversity;* *e) Maintain or enhance, as far as practicable:* *i. Their natural functioning and character; and* *ii. Amenity values;* *f) Control the adverse effects of pest species, prevent their introduction and reduce their spread; and,* *g) Avoid, remedy or mitigate the adverse effects of natural hazards, including flooding and erosion.*	See response to 3.1.1 above.
3.1.3 Manage the allocation and use of fresh water by undertaking all of the following: *a) Recognising and providing for the social and economic benefits of sustainable water use;* *b) Avoiding over-allocation, and phasing out existing over-allocation, resulting from takes and discharges; c) Ensuring the efficient allocation and use of water by:* *i) Requiring that the water allocated does not exceed what is necessary for its efficient use;* *ii) Encouraging the development or upgrade of infrastructure that increases use efficiency;* *iii. Providing for temporary dewatering activities necessary for construction or maintenance.*	An evaluation of efficient water use in relation to the proposal is provided in Section 6.6. The proposal will see a significant reduction in primary allocation from Bendigo Creek, along with significant reductions in the monthly and annual volume sought. The catchment is fully allocated in accordance with Policy 6.4.2 of the RPW, and the proposal will not over-allocate the catchment with regards to these terms. The applicant is already using their water as efficiently as

	possible, utilising a large storage pond and irrigating via pivot and k-line. Future expanded irrigation areas will utilise similarly water-efficient infrastructure.
3.1.4 Manage for water shortage by undertaking all of the following: *a) Encouraging land management that improves moisture capture, infiltration, and soil moisture holding capacity.* *b) Encouraging collective coordination and rationing of the take and use of water when river flows or aquifer levels are lowering, to avoid breaching any minimum flow or aquifer level restriction to optimise use of water available for taking;* *c) Providing for water harvesting and storage, subject to allocation limits and flow management, to reduce demand on water bodies during periods of low flows.*	As explained earlier and above, the applicant utilises water efficiently via an integrated storage system and pivots and k-line, ensuring over-use is avoided. Water harvesting and storage takes place within the property via a large storage pond that has an optional connection to a second pond where needed.
4.1.4 Assess activities for natural hazard risk to people, property and communities, by considering all of the following: *a) The natural hazard risk identified, including residual risk; and* *b) Any measures to avoid, remedy or mitigate those risks, including relocation and recovery methods; and* *c) The long term viability and affordability of those measures; and* *d) Flow-on effects of the risk to other activities, individuals and communities; and* *e) The availability of, and ability to provide, lifeline utilities, and essential and emergency services, during and after a natural hazard event.*	According to ORC's Natural Hazards Portal, there is a record of Bendigo Creek flooding downstream of the irrigation areas in 1987. This is not considered to pose a risk to the applicant and the activity will not exacerbate this (and it would presumably reduce likelihood of it somewhat). There are no other known hazard risks.
4.2.2 Ensure Otago's people and communities are able to mitigate and adapt to the effects of climate change, over no less than 100 years, by all of the following: *a) Taking into account the effects of climate change, including by using the best relevant climate change data; and*	The uncertainty of the effects of climate change are such that providing future water security to the applicant, both in terms of sufficient volume and duration, is critical to the ongoing operation of the farm.

b) Applying a precautionary approach when assessing and managing the effects of climate change where there is scientific uncertainty and potentially significant or irreversible effects; and *c) Encouraging activities that assist to reduce or mitigate the effects of climate change; and* *d) Encouraging system resilience.*	
5.2.1 Recognise all of the following elements as characteristic or important to Otago's historic heritage: *a) Residential and commercial buildings;* *b) Māori cultural and heritage values;* *c) 19th and early 20th century pastoral sites;* *d) Early surveying, communications and transport, including roads, bridges and routes;* *e) Early industrial historic heritage, including mills and brickworks;* *f) Gold and other mining systems and settlements;* *g) Dredge and ship wrecks;* *h) Coastal historic heritage, particularly takata whenua occupation sites and those associated with early European activity such as whaling;* *i) Memorials;* *j) Trees and vegetation.*	As the applicant's deemed permit is based on historic mining privileges and water race licences, it may have some heritage value as a remnant of Central Otago's gold mining heritage.
5.3.1 Manage activities in rural areas, to support the region's economy and communities, by: *a) Enabling primary production and other rural activities that support the rural economy; and* *b) Providing for mineral exploration, extraction and processing; and* *c) Minimising the loss of significant soils; and* *d) Restricting the establishment of activities in rural areas that may lead to reverse sensitivity effects; and* *e) Minimising the subdivision of productive rural land into smaller lots that may result in rural residential activities; and*	Replacement of the applicant's permit with sufficient instantaneous and volumetric rates of take will ensure the farm operation can continue into the future. This will also help to minimise any chance of future subdivision of productive rural land. Water use is already via efficient means (pivot & k-line currently, and potentially also drip in future), meaning the proposal does not pose any risk to soil health.

	f) Providing for other activities that have a functional need to locate in rural areas, including tourism and recreational activities that are of a nature and scale compatible with rural activities.	
5.4.3	*Apply a precautionary approach to activities where adverse effects may be uncertain, not able to be determined, or poorly understood but are potentially significant or irreversible.*	Due to relatively reliable historic abstraction records and a long history of use, uncertainty is low and a precautionary approach is not considered necessary. The effects of taking and use of water are well known and not significant. Any effect is not irreversible. Where information gaps occur, Council has the ability to review consent conditions and adjust methods or approaches to better manage adverse effects.

7.2.4 Proposed Regional Policy Statement for Otago

The following policies from the 2015 Proposed Regional Policy Statement are relevant to this application for consent replacements. Only those policies that have not been directly superseded by operative policies have been included.

Table 6: Relevant policies from the Proposed Regional Policy Statement for Otago, 2015

Policy		Comments
1.1.2	*Ensure that local authorities exercise their functions and powers, to:* *a) Accord Kāi Tahu a status distinct from that of interest groups and members of the public, consistent with their position as a Treaty partner; and,* *b) Involve Kāi Tahu in resource management decision-making processes and implementation; and* *c) Take into account Kāi Tahu views in resource management decision-making processes and implementation, particularly regarding the relationship of their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taoka; and* *d) Ensure Kāi Tahu have the prerogative to:* *i. Identify their relationship with their ancestral lands, water, sites, wāhi tapu, and other taoka; and*	Kāi Tahu have been given due consideration as a stakeholder in Section 5. Applicable provisions of the Kāi Tahu ki Otago Natural Resource Management Plan as they relate to this application have also been considered below.

	ii. Determine how best to express that relationship; and *e) Ensure Kāi Tahu are able to exercise kaitiakitaka; and* *f) Ensure that district and regional plans:* *i. Give effect to the Ngāi Tahu Claims Settlement Act 1998; and* *ii. Recognise and provide for statutory acknowledgement areas, as detailed in Schedule 2; and* *iii. Provide for other areas in Otago that are recognised as significant to Kāi Tahu in a manner similar to that prescribed for statutory acknowledgement areas.*	
2.1.1	*Recognise freshwater values, and manage freshwater, to:* *a) Support healthy ecosystems in all Otago aquifers, and rivers, lakes, wetlands, and their margins; and* *b) Retain the range and extent of habitats provided by freshwater; and* *c) Protect outstanding water bodies and wetlands; and* *d) Protect migratory patterns of freshwater species, unless detrimental to indigenous biodiversity; and* *e) Avoid aquifer compaction, and seawater intrusion in aquifers; and* *f) Maintain good water quality, including in the coastal marine area, or enhance it where it has been degraded; and* *g) Maintain or enhance coastal values supported by freshwater values; and* *h) Maintain or enhance the natural functioning of rivers, lakes, and wetlands, their riparian margins, and aquifers; and* *i) Retain the quality and reliability of existing drinking water supplies; and* *j) Protect Kāi Tahu values; and* *k) Provide for other cultural values; and* *l) Protect important recreation values; and* *m) Maintain the aesthetic and landscape values of rivers, lakes, and wetlands; and* *n) Avoid the adverse effects of pest species, prevent their introduction and reduce their spread; and*	The ecological and hydrological features of Bendigo Creek are discussed in Section 3.1, while the potential effects on these features are discussed in Section 6. Water quality is unlikely to be affected by the activity. Kāi Tahu and other cultural values have been assessed above and in Section 7.2.6 of this document. Recreational values are addressed in Section 6.4, aesthetic and landscape values will be unaffected by the proposal, and no flooding, erosion, or other natural hazards will be caused or exacerbated by the activity. Replacement of the applicant's permits will enable them to continue operating their existing infrastructure within their design parameters.

o) Mitigate the adverse effects of natural hazards, including flooding and erosion; and *p) Maintain the ability of existing infrastructure to operate within their design parameters.*	
2.1.2 Recognise the values of beds of rivers and lakes, wetlands, and their margins, and manage them to: *a) Protect or restore their natural functioning; and* *b) Protect outstanding water bodies and wetlands; and* *c) Maintain good water quality, or enhance it where it has been degraded; and* *d) Maintain ecosystem health and indigenous biodiversity; and* *e) Retain the range and extent of habitats supported; and* *f) Maintain or enhance natural character; and* *g) Protect Kāi Tahu values; and* *h) Provide for other cultural values; and* *i) Maintain their aesthetic and amenity values; and* *j) Avoid the adverse effects of pest species, prevent their introduction and reduce their spread; and* *k) Mitigate the adverse effects of natural hazards, including flooding and erosion; and* *l) Maintain bank stability.*	Much of this policy is also reflected in Policy 2.1.1, which is discussed above.
2.1.6 Recognise the values of ecosystems and indigenous biodiversity, and manage ecosystems and indigenous biodiversity, to: *a) Maintain or enhance ecosystem health and indigenous biodiversity; and* *b) Maintain or enhance areas of predominantly indigenous vegetation; and* *c) Buffer or link existing ecosystems; and* *d) Protect important hydrological services, including the services provided by tussock grassland; and* *e) Protect natural resources and processes that support indigenous biodiversity; and* *f) Maintain habitats of indigenous species that are important for recreational, commercial, cultural or customary purposes; and* *g) Protect biodiversity significant to Kāi Tahu; and*	The ecosystem values of Bendigo Creek are discussed in Section 3.4, while the potential effects on these values are considered in Section 6.2.

h) Avoid the adverse effects of pest species, prevent their introduction and reduce their spread.	
2.1.7 Recognise the values of natural features, landscapes, seascapes and the coastal environment are derived from the following attributes, as detailed in Schedule 4: *a) Biophysical attributes, including:* *i. Natural science factors;* *ii. The presence of water;* *iii. Vegetation (indigenous and introduced);* *iv. The natural darkness of the night sky;* *b) Sensory attributes, including:* *i. Legibility or expressiveness;* *ii. Aesthetic values;* *iii. Transient values, including nature's sounds;* *iv. Wild or scenic values;* *c) Associative attributes, including:* *i. Whether the values are shared and recognised;* *ii. Cultural and spiritual values for Kāi Tahu;* *iii. Historical and heritage associations.*	The values of applicable natural features potentially affected by the proposal (namely Bendigo Creek) have been recognised in Section 3.4.
2.2.1 Identify areas and values of significant indigenous vegetation and significant habitats of indigenous fauna, using the attributes detailed in Schedule 5.	Bendigo Creek is not known to provide significant habitat for indigenous fauna or feature significant indigenous vegetation.
3.1.1 Recognise the natural and physical environmental constraints of an area, the effects of those constraints on activities, and the effects of those activities on those constraints, including: *a) The availability of natural resources necessary to sustain the activity; and* *b) The ecosystem services the activity is dependent on; and* *c) The sensitivity of the natural and physical resources to adverse effects from the proposed activity/land use; and* *d) Exposure of the activity to natural and technological hazard risks; and* *e) The functional necessity for the activity to be located where there are significant constraints.*	The existing natural environment as it relates to the proposal is examined in Section 3 of this document, while the effects of the activity on the natural environment are assessed in Section 6. Based on ORC's GIS mapping, there is a risk of flooding downstream of the activity, however this risk level is low and unlikely to affect the activity.

7.2.5 Regional Plan: Water for Otago

The following policies, which give effect to the plan's objectives, are relevant to this application for resource consent.

Table 7: Assessment of RPW policies

Policy	Comments
5.4.1 To identify the following natural and human use values supported by Otago's lakes and rivers, as expressed in Schedule 1: *(a) Outstanding natural features and landscapes;* *(b) Areas with a high degree of naturalness;* *(c) Areas of significant indigenous vegetation, significant habitats of indigenous fauna, and significant habitats of trout and salmon;* *(d) Ecosystem values;* *(e) Water supply values;* *(f) Registered historic places; and* *(g) Spiritual and cultural beliefs, values and uses of significance to Kai Tahu.*	Bendigo Creek is not listed in Schedule 1.
5.4.2 In the management of any activity involving surface water, groundwater or the bed or margin of any lake or river, to give priority to avoiding, in preference to remedying or mitigating: *(1) Adverse effects on:* *(a) Natural values identified in Schedule 1A;* *(b) Water supply values identified in Schedule 1B;* *(c) Registered historic places identified in Schedule 1C, or archaeological sites in, on, under or over the bed or margin of a lake or river;* *(d) Spiritual and cultural beliefs, values and uses of significance to Kai Tahu identified in Schedule 1D;* *(e) The natural character of any lake or river, or its margins;* *(f) Amenity values supported by any water body; and*	Bendigo Creek is not listed in Schedule 1. Due to the reduction in instantaneous allocation sought, it is expected that the proposal will avoid adverse effects on the natural character of the creek and the minor amenity values associated with it. The proposal will not cause or exacerbate flooding, erosion, land instability, sedimentation or property damage.

Policy	Comments
(2) Causing or exacerbating flooding, erosion, land instability, sedimentation or property damage.	
5.4.3 In the management of any activity involving surface water, groundwater or the bed or margin of any lake or river, to give priority to avoiding adverse effects on: *(a) Existing lawful uses; and* *(b) Existing lawful priorities for the use, of lakes and rivers and their margins.*	There are no other lawful users of Bendigo Creek water.
5.4.4 To recognise Kai Tahu's interests in Otago's lakes and rivers by promoting opportunities for their involvement in resource consent processing.	The Kai Tahu ki Otago Natural Resource Management Plan (NRMP) is considered later in this document.
5.4.8 To have particular regard to the following features of lakes and rivers, and their margins, when considering adverse effects on their natural character *(a) The topography, including the setting and bed form of the lake or river;* *(b) The natural flow characteristics of the river;* *(c) The natural water level of the lake and its fluctuation;* *(d) The natural water colour and clarity in the lake or river;* *(e) The ecology of the lake or river and its margins; and* *(f) The extent of use or development within the catchment, including the extent to which that use and development has influenced matters (a) to (e) above.*	The natural flow characteristics of Bendigo Creek are discussed earlier in this report. It should be noted that the Bendigo Creek take has been occurring for close to a century, meaning the ecology and (to a lesser extent) hydrology of the creek has likely adapted to account for the applicant's water take. Any changes to this take would likely change the character of the creek itself.
5.4.9 To have particular regard to the following qualities or characteristics of lakes and rivers, and their margins, when considering adverse effects on amenity values: *(a) Aesthetic values associated with the lake or river; and* *(b) Recreational opportunities provided by the lake or river, or its margins.*	Considering the long history of abstraction from Bendigo Creek, it could be argued that the aesthetic values of the creek are intrinsically tied to the long-established water take. Furthermore, virtually all of Bendigo Creek is located on private land and is unsupportive of recreation, with the small size of the creek unsupportive of angling.
6.4.0 To recognise the hydrological characteristics of Otago's water resources, including behaviour and trends in:	The hydrological regime of Bendigo Creek is

Policy	Comments
(a) The levels and flows of surface water bodies; and *(b) The levels and volumes of groundwater; and* *(c) Any interrelationships between adjoining bodies of water, when managing the taking of water.*	discussed earlier in this report.
6.4.0A To ensure that the quantity of water granted to take is no more than that required for the purpose of use taking into account: *(a) How local climate, soil, crop or pasture type and water availability affect the quantity of water required; and* *(b) The efficiency of the proposed water transport, storage and application system.*	The proposed irrigation volumes have been calculated in accordance with guidelines which ORC accepts as representing reasonable water requirements for irrigation of pasture and grapes. The irrigation volumes account for all factors mentioned in the policy (climate, crop, efficiency of use, etc.). The applicant has recently invested significant funds in the installation of a new intake, pipeline and water meter, along with a major upgrade of the storage pond, to ensure that their water take, conveyance, and storage is as efficient as possible. The most efficient means of water application – pivot, k-line and drip (future) – are used.
6.4.0C To promote and give preference, as between alternative sources, to the take and use of water from the nearest practicable source.	The proposal seeks to enable the continued taking of water from the nearest practicable source.
6.4.1 To enable the taking of surface water, by: *(a) Defined allocation quantities; and* *(b) Provision for water body levels and flows,* *except when:* *(i) The taking is from Lakes Dunstan, Hawea, Roxburgh, Wanaka or Wakatipu, or the main stem of the Clutha River/Mata-Au or Kawarau Rivers.* *(ii) All of the surface water or connected groundwater taken is immediately returned to the source water body.* *(iii) Water is being taken which has been delivered to the source water body for the purpose of that subsequent take.*	The proposal seeks to take water that is within the current primary allocation limit for Bendigo Creek.

Policy	Comments
6.4.2 To define the primary allocation limit for each catchment, from which surface water takes and connected groundwater takes may be granted, as the greater of: *(a) That specified in Schedule 2A, but where no limit is specified in Schedule 2A, 50% of the 7-day mean annual low flow; or* ***(b) The sum of consented maximum instantaneous, or consented 7-day, takes of:*** ***(i) Surface water as at:*** *(1) 19 February 2005 in the Welcome Creek catchment; or* *(2) 7 July 2000 in the Waianakarua catchment; or* ***(3) 28 February 1998 in any other catchment**; and* *(ii) Connected groundwater as at 10 April 2010,* *less any quantity in a consent where:* *(1) In a catchment in Schedule 2A, the consent has a minimum flow that was set higher than that required by Schedule 2A.* *(2) All of the water taken is immediately returned to the source water body.* *(3) All of the water being taken had been delivered to the source water body for the purpose of that subsequent take.* *(4) The consent has been surrendered or has expired (except for the quantity granted to the existing consent holder in a new consent).* *(5) The consent has been cancelled (except where the quantity has been transferred to a new consent under Section 136(5)).* *(6) The consent has lapsed.*	The proposal seeks to take water that is within the current primary allocation limit for Bendigo Creek, per Policy 6.4.2(b)(i)(3).
6.4.2A Where an application is received to take water and Policy 6.4.2(b) applies to the catchment, to grant from within primary allocation no more water than has been taken under the existing consent in at least the preceding five years, except in the case of a registered community drinking water supply where an allowance may be made for growth that is reasonably anticipated.	The rate of take sought is no more than what has been taken under the existing permits.

Policy	Comments
6.4.7 The need to maintain a residual flow at the point of take will be considered with respect to any take of water, in order to provide for the aquatic ecosystem and natural character of the source water body.	Residual flow considerations are discussed earlier in this report (Section 6.3).
6.4.16 In granting resource consents to take water, or in any review of the conditions of a resource consent to take water, to require the volume and rate of take to be measured in a manner satisfactory to the Council unless it is impractical or unnecessary to do so.	The take will continue to be metered in accordance with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.
6.4.19 When setting the duration of a resource consent to take and use water, to consider: *(a) The duration of the purpose of use;* *(b) The presence of a catchment minimum flow or aquifer restriction level;* *(c) Climatic variability and consequent changes in local demand for water;* *(d) The extent to which the risk of potentially significant, adverse effects arising from the activity may be adequately managed through review conditions;* *(e) Conditions that allow for adaptive management of the take and use of water;* *(f) The value of the investment in infrastructure; and* *(g) Use of industry best practice.*	These matters are discussed in Section 8.

7.2.6 Cultural policies assessment

Iwi planning documents are not statutory instruments, but they do have statutory weight under the RMA in relation to the plan preparation process. The RPS must take into account any relevant planning document recognised by an iwi authority, however, iwi management plans retain their ability to address concepts from a Maori paradigm without constraint from the RMA.

7.2.6.1 Statutory Acknowledgements

Bendigo Creek is a tributary of the Clutha River/Mata-Au, which is a Statutory Acknowledgement Area. Pursuant to the Ngai Tahu Claims Settlement Act 1998, Te Runanga o Ngai Tahu should be advised of this application.

7.2.6.2 Te Runanga o Ngai Tahu Freshwater Policy Statement

The Ngai Tahu Freshwater Policy Statement has status as an iwi management plan, to complement and be read alongside the Kai Tahu Ki Otago Natural Resource Management Plan (NRMP).

In terms of integrated management, whilst this document is mostly directed at the organizational level, the policy statement confirms that catchment management planning is the preferred approach. This includes catchment-specific strategies as providing a better basis for achieving integrated sustainable management of natural and physical resources.

Where Ngai Tahu values have been identified, they should be maintained as a minimum, but preferably enhanced. Particular consideration of the mauri (life force) of Bendigo Creek has been given throughout the application, exemplified in reduced instantaneous, monthly and annual allocations.

7.2.6.3 Kāi Tahu ki Otago NRMP

The policies within the Kāi Tahu ki Otago NRMP that are considered particularly relevant to this application are presented in the below table. The proposal is considered generally consistent with these policies, as discussed in the table.

Table 8: Relevant policies of the Kai Tahu ki Otago NRMP

Policy	Comments
To require an assessment of instream values for all activities affecting water.	The values of Bendigo Creek are considered in Section 3.4.
To require that resource consent applicants seek only the amount of water actually required for the purpose specified in the application.	The proposed water take volumes are considered to be reasonable for the proposed uses, based on the specific characteristics of the sites and recognised reasonable water use guidelines for irrigation (see Section 6.6).
To require that all water takes are metered and reported on, and information be made available upon request to Kāi Tahu ki Otago.	The water take will continue to be metered as detailed in Section 6.10. Metering data will be made available to ORC, and Kāi Tahu ki Otago can request this data either from ORC or from the applicants, if desired.
To oppose the granting of water take consents for 35 years. Consistent with a precautionary approach, either a review clause or a reduced term may be sought.	Consent duration is discussed in Section 8.
To require that fish passage is provided for at all times, both upstream and downstream.	As discussed in Section 6.3, Bendigo Creek rarely has a surface connection with the Clutha River/Mata-au, meaning it would be virtually impossible to provide for fish passage year-round regardless of any residual or minimum flow conditions imposed.

Policy	Comments
To require that fish screens be fitted to all pumps and race intakes.	Given that there are no fish in the vicinity of the intake, and no way for fish to swim upstream to the intake (due to natural in-stream barriers), no fish screens are proposed.
To encourage those that extract water for irrigation to use the most efficient method of application. *Flood irrigation, border dyke and contour techniques are less likely to be supported than spray irrigation techniques.*	Current irrigation is via efficient means – pivot and k-line. Future vineyard conversions will also use efficient water application via drip.
To encourage irrigation to occur at times when winds are light and evaporation low.	Irrigation at the most efficient times is in the applicants' best interests as well, although it is noted that it will not be practical to avoid irrigation in adverse conditions 100 % of the time.

8. Consent Duration, Review and Lapse

A consent term of 25 years is sought. In accordance with Section 123 of the RMA, a term of up to 35 years may be granted for a resource consent to take and use water. A shorter term is requested solely due to the policies of the Kāi Tahu ki Otago NRMP, as discussed above. This consent duration satisfies the criteria set out in Policy 6.4.19 of the RPW due to the following:

- The use of the water for irrigation supply is very likely to be in effect for a duration of at least 25 years, given the suitability of the property for farming and viticulture. It is also worth noting that the proposed takes will supply irrigation infrastructure that is in place and established.
- While there is no historic flow data for Bendigo Creek, the applicant has voluntarily installed a flow monitoring station on the creek to better understand the hydrology of the watercourse and manage potential effects on the nature of the creek from the abstraction. This will help to avoid adverse effects on Bendigo Creek in the future.
- Fish values are very limited in the creek, and the watercourse appears to naturally run dry well-prior to it's confluence with the Clutha, and throughout the year. This means that any effects of the abstraction on the hydrology, ecology, or cultural values of the creek will be negligible.
- Abstraction from the creek under the existing permits and preceding permits and rights has occurred for close to a century. This long history of take and use makes it easier to forecast future potential effects on natural and cultural values due to the continuing operation of the activity.
- The local climate is likely to become more variable and less predictable in the coming decades due to climate change, based on the climate change projections for the Otago region prepared by the

Ministry for the Environment in 2018 as available on their website. In particular, temperatures (and therefore evapotranspiration) are expected to increase, and while precipitation may also increase, changes in the timing (largest increases in winter and spring) and form (more rain and less snow) may reduce water security in the region. More frequent droughts are predicted. Securing reliable water access to Bendigo Creek, while preserving the values of this catchment, will enable the farm to continue operating at its fullest potential into the future.

- This report and the supporting documents demonstrate that the activity will have no more than minor actual or potential adverse environmental effects. The probability that this assessment and proposed mitigation measures have not addressed all actual or potential adverse effects is low and the scope of remaining unforeseen adverse effects is limited. Review conditions can adequately manage unforeseen adverse effects if required.

- The existing water distribution infrastructure and irrigation systems represent a significant investment, particularly considering the recent overhaul of the Bendigo Creek take, conveyance and storage infrastructure. Further investment will be required for ongoing maintenance of the infrastructure, and any future expansions/upgrades. The request for a 25-year consent duration gives the applicant the security to make ongoing investment decisions based on the returns from their operation over this duration.

9. CONCLUSION

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

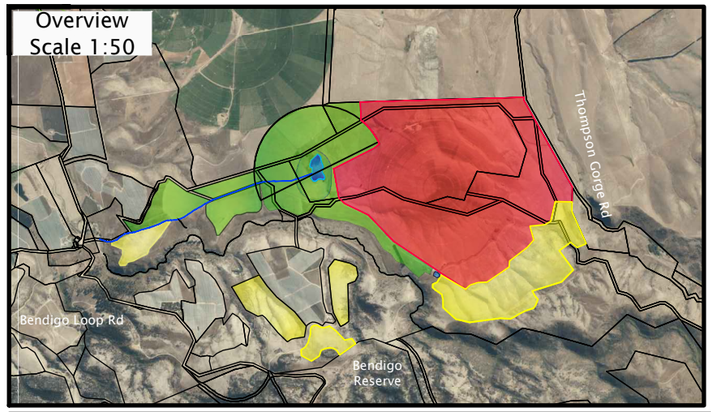
a) It is expected that the adverse effects on the environment will be minor or less;
b) The proposal meets the non-notification requirements of Section 95A of the RMA; and
c) The proposal is consistent with the requirements of the RMA, Council policy and other relevant matters.

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.

Appendix A: Applicable maps and images


Cherry Holdings pond
Bendigo Station irrigation pond
Pond overflow-discharge back to creek
Bendigo Creek
Bendigo Creek monitoring station
Stockwater holding pond
Water meter
Pipeline
WR3908Cr & WR1233Cr take point
Aurora Creek
subject area
Bendigo
N
800 m

Overview
Scale 1:50



THOMSON GORGE ROAD

N

PASTORAL
100ha

Duck
Pond

Extension

CHERRIES
202ha

Water Line

7.0ha
Viticulture

8.05ha
Viticulture

14.00ha
Viticulture

6.7ha
Viticulture

Holding
Pond

46.7ha
Viticulture

L\17136 - Concept Plans - John Perriam - Bendigo\CAD\LP\17136_02_SHINE BASIN_REV D.dwg Plotted: 13.07.2017

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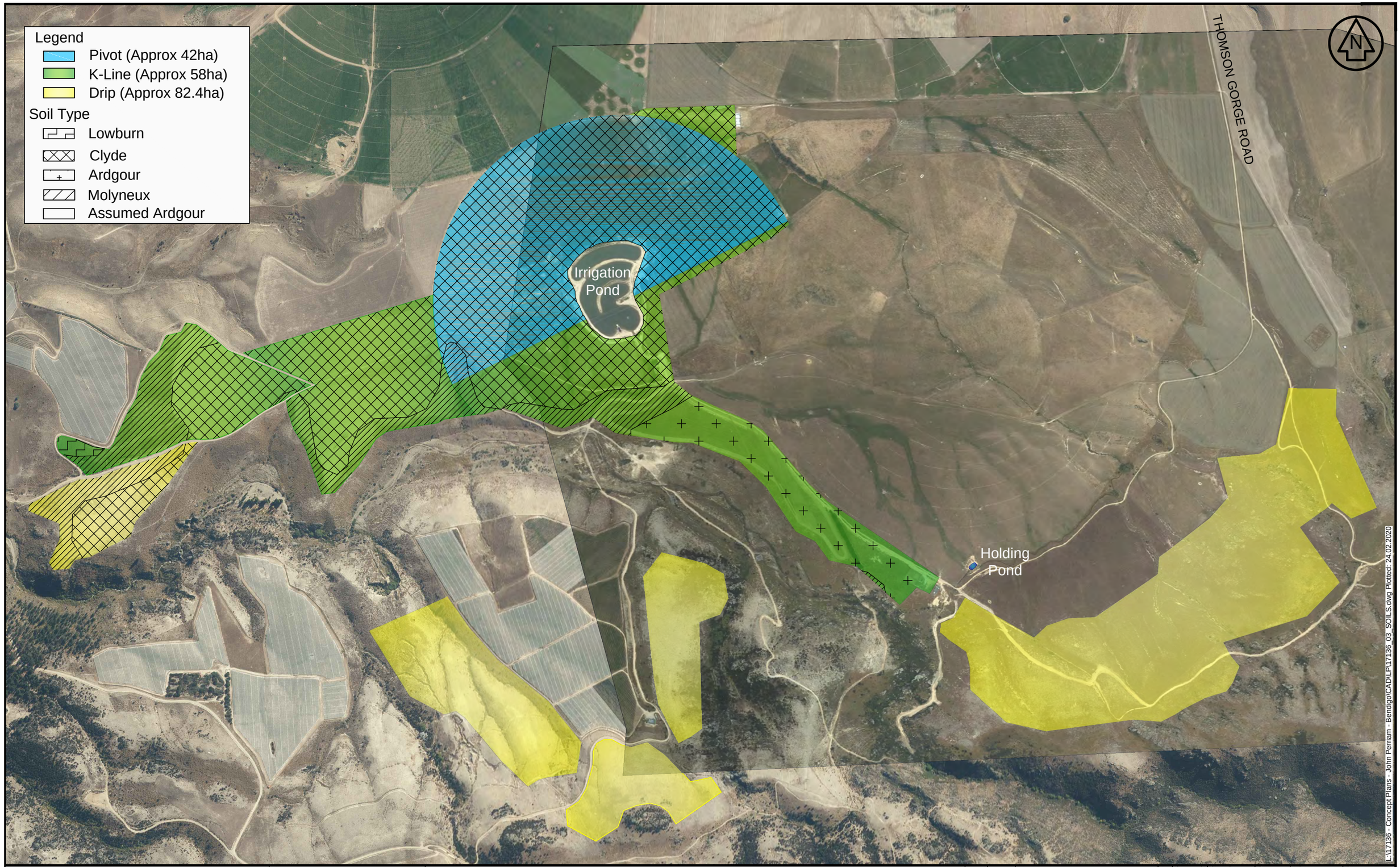
THE SHINE BASIN
Proposed Cherry Orchard

Rev.	Date	Revision Details	By
A	12.4.17-	Areas changed, colours ammended	slc
B	26.4.17-	Areas changed, pivot added	slc
C	4.5.17	Vit areas added	slc
D	13.7.17	Finalised for Council	slc

Surveyed	Signed	Date	Job No.	Drawing No.	
			17136	00_02	
Drawn	Signed	Date	Scale		
SLC		3.4.17	1:10000 @ A3		
Designed	Signed	Date	Datum & Level	Rev.	
			LP2000	D	



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THE SHINE BASIN
SOILS MAP

Rev.	Date	Revision Details	By

Surveyed	Signed	Date	Job No.	Drawing No.	
			17136	00_03	
Drawn	Signed	Date	Scale		
SLC		24.2.20	1:10000 @ A3		
Designed	Signed	Date	Datum & Level	Rev.	
			LP2000		

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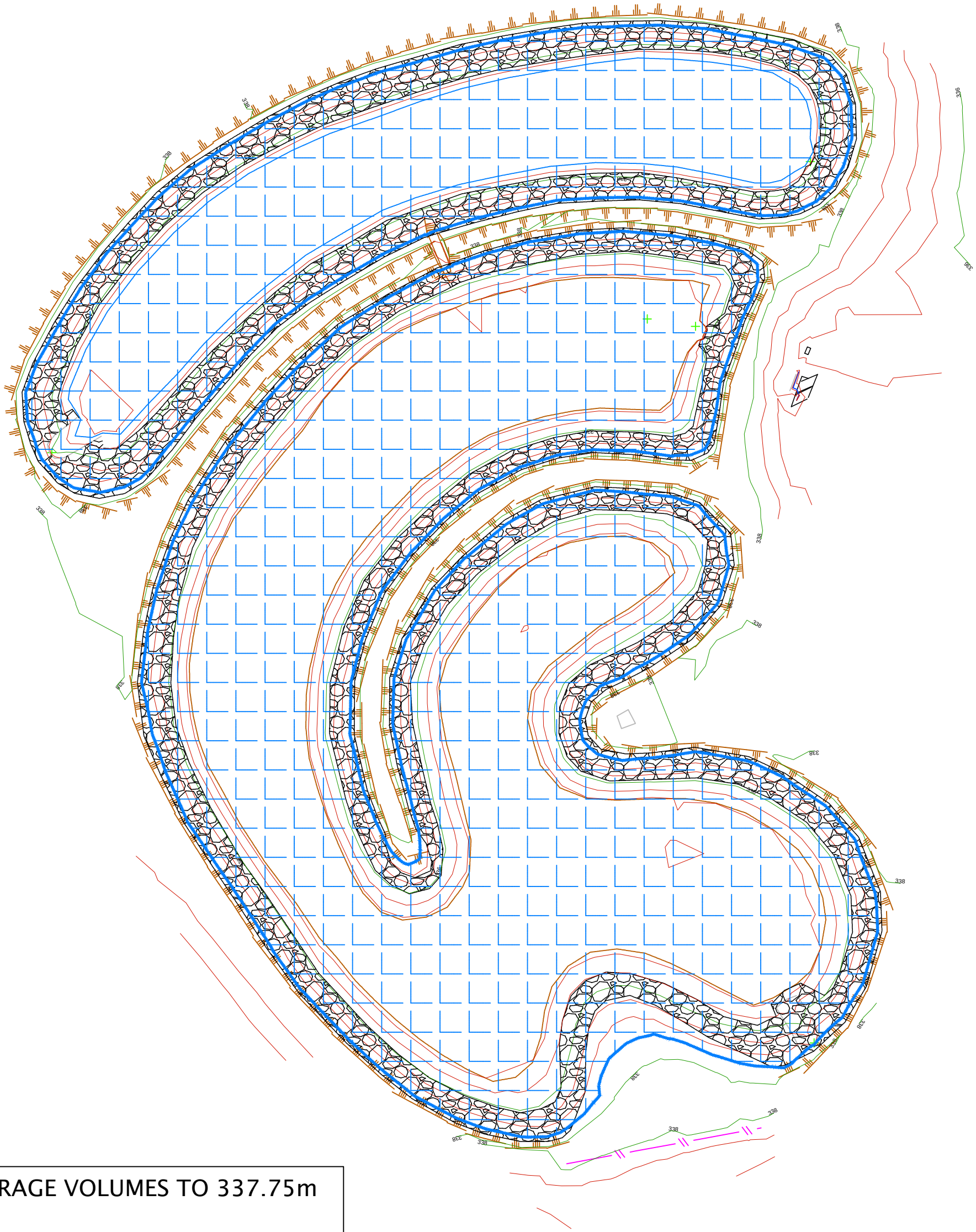
Appendix B: Pond plans & schematics



STORAGE VOLUMES TO 337.75m

OUTER POND - 18,322m³
ADDITIONAL ~2,300m³ FLOODED

INNER POND - 53,820m³

TOTAL STORAGE - 72,142m³

ISSUED FOR COMPLETION 26.06.2018

Rev.	Date	Revision Details	By
-	-	-	-

Surveyed	Signed	Date	Job No.	Drawing No.	
RAF		21.06.18	17238	01	
Drawn	Signed	Date	Scale		
RAF		25.06.18	1:1000@ A3		
Designed	Signed	Date	Datum & Level	Rev.	
-		-	NZTM 2000 & MSL	-	

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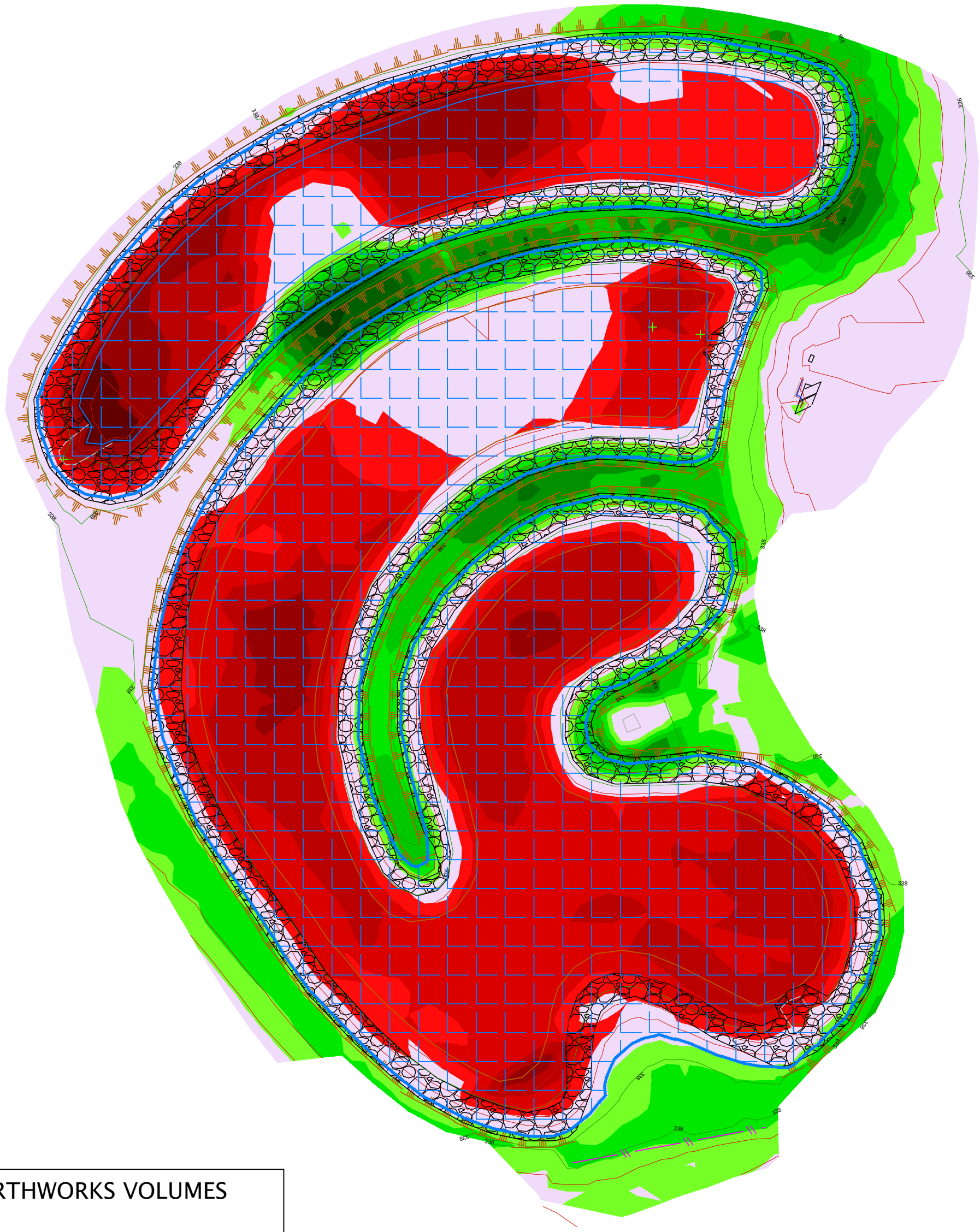
STORAGE VOLUMES
SHINE DAM AS BUILT
BENDIGO STATION

L:\17238 - Shine Pivot Setout - Bendigo Station Ltd\CAD\17238_Dam_Asbuilt_01.dwg Plotted: 25.06.2018



EARTHWORKS VOLUMES

TOTAL CUT - 31,095m³

TOTAL FILL - 18,495m³

ISSUED FOR COMPLETION 26.06.2018

Rev.	Date	Revision Details	By
-	-	-	-

Surveyed	Signed	Date	Job No.	Drawing No.	
NKA		XX.XX.16	17238	01_EWK	
Drawn	Signed	Date	Scale		
NKA		XX.XX.16	1:1000@ A3		
Designed	Signed	Date	Datum & Level	Rev.	
NKA		XX.XX.16	NZTM 2000 & MSL	-	

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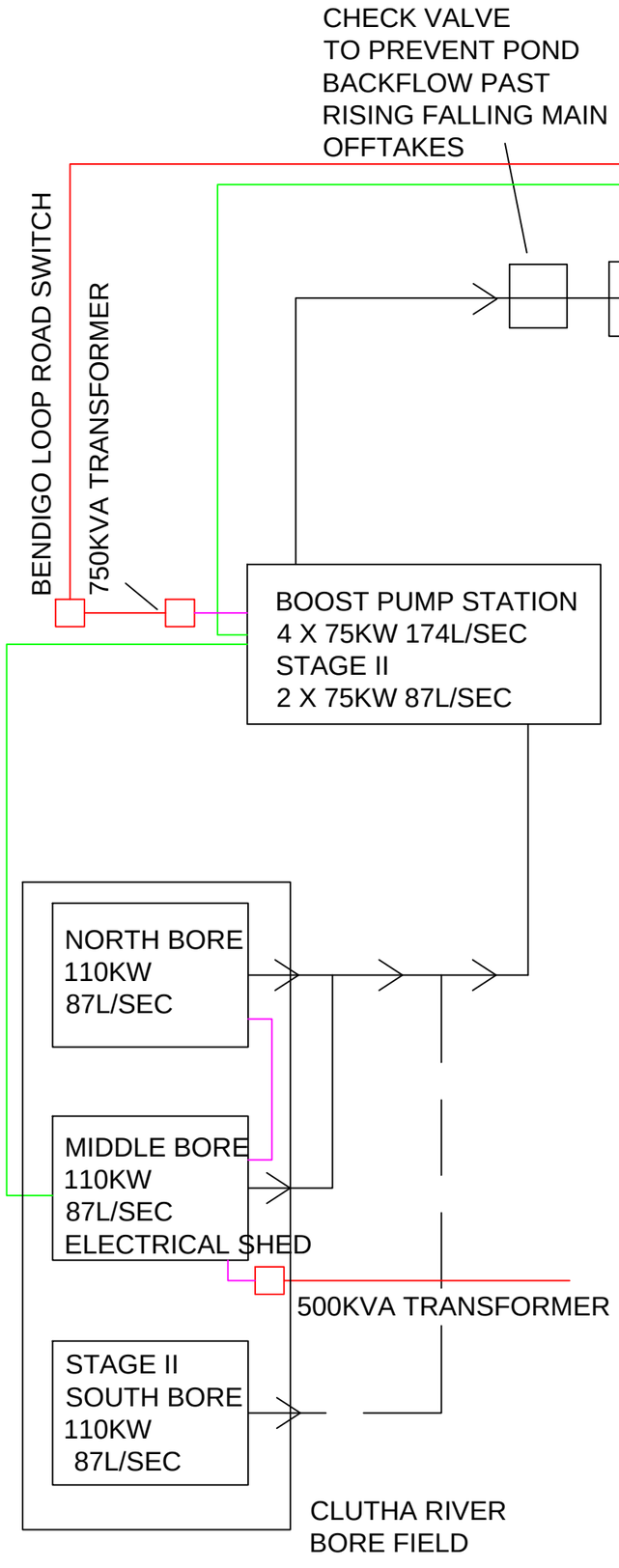
EARTHWORKS VOLUMES
SHINE DAM AS BUILT
BENDIGO STATION

L:\17238 - Shine Pivot Setout - Bendigo Station Ltd\CAD\17238_Dam_Asbuilt_01.dwg Plotted: 25.06.2018



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:	DRAWN:	CHECKED:
	date	DG	RS
PROJECT NO:	DRAWING NO:		REVISION:
1	1		1

Appendix C: Bendigo Creek hydrology report

Technical Comment

Monday, 24 February 2020 Landpro Reference: S15298

To: Will Nicolson, Planner, Landpro Ltd

From: Christina Bright, Environmental Scientist, Landpro Ltd

Subject: Hydrological assessment for flow loses/gains – Bendigo Creek

1. Introduction

Bendigo Station Ltd wishes to obtain resource consent from the Otago Regional Council to continue abstracting water from Bendigo Creek for irrigation and stock drinking that is currently authorised by Deemed Permits WR3908Cr and WR1233Cr. On 16 January 2020, Landpro conducted a site visit to Bendigo Station and completed a stream flow assessment. The purpose of the assessment was to:

- Measure flows in Bendigo Creek; and
- Determine if any flow losses occur.

The results of the flow verification are summarized in Table 2 below. Flow gauging results are also appended in Appendix A.

1.1 Catchment Description

The Bendigo Creek catchment is located near Cromwell, Otago, and is a relatively large order 4 catchment of 5,846ha. The catchment drains a general east to west direction from the Dunstan Mountains to the Clutha River. The headwaters of Bendigo Creek originate at approx. 1,500 mamsl and flow to the Clutha River with the confluence at 200 mamsl. Table 1 summarizes the modelled flow statistics for Bendigo Creek at the Bendigo Station Ltd abstraction point and State Highway 8 bridge crossing.

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Table 1: Flow statistics (MALF – mean annual low flow) for Bendigo Creek upstream of the Bendigo Station Ltd point of take, and at the State Highway (Source: NIWA River Maps [1]).

Site Name	Catchment Area (ha)	7-day MALF (L/s)	Mean flow (L/s)
Bendigo Creek (point of take)		63.3	243
Bendigo Creek (SH 8)	5,846	80.4	408

[1] NIWA River Maps is a model developed by NIWA and a tool utilized by the Otago Regional Council for modelling flow statistics in catchments where little hydrological information is available, as well as other relevant ecological variables (Booker & Whitehead, 2017).

In New Zealand's River Environment Classification, Bendigo Creek is classified as:

- CD_M_HS_T_MO_HG in the headwaters;
- CD_M_HS_P_MO_HG at the abstraction points; and
- CD_H_HS_P_MO_LG in the lower reaches.

The climate of the catchment is cool-dry (CD). The source of flow is classified as mountainous (M) to hilly (H), so that in the headwaters the source of flow is seasonal, with low flows in winter and higher flows in summer, however on the flatter to hilly pastoral land low flows are experienced in late summer with higher flows in spring due to rainfall and snowmelt. The geology across the catchment is classified as hard sedimentary (HS), and landcover as tussock (T) in the headwaters, and pastoral (P) on the flatter to hilly land. The catchment is median order (MO) so that the stream network consistent of medium sized tributaries of order 3 to 4. The valley form (gradient) of the catchment in the headwaters and at the abstraction point is described as high gradient (HG) and consists of steep channels, whereas on the flatter pastoral land described as being low gradient with meandering, wider river sections.

Bendigo Creek historically loses flow, and anecdotally there is never any flow at the SH8 bridge crossing. The following assessment was carried out to better understand these flow losses.

2. Hydrology Assessment

2.1 Measured Flows

A series of flow gaugings were undertaken on the 16 January 2020 by Landpro Limited to determine the quantity of water flowing downstream of the water take, and to estimate the quantity of water lost to the fine loose gravels of the creek.

The abstraction point was turned off for 24hrs prior to the survey, to allow all water available in the creek to flow past the point of take. The location of the survey sites is summarized in Figure 1 below.

To identify potentially losing/gaining reaches of Bendigo Creek, flow measurements were collected longitudinally down the main stem of Bendigo Creek. A differential gauging approach was used to identify differences in flow that related to either a gain or loss of water.

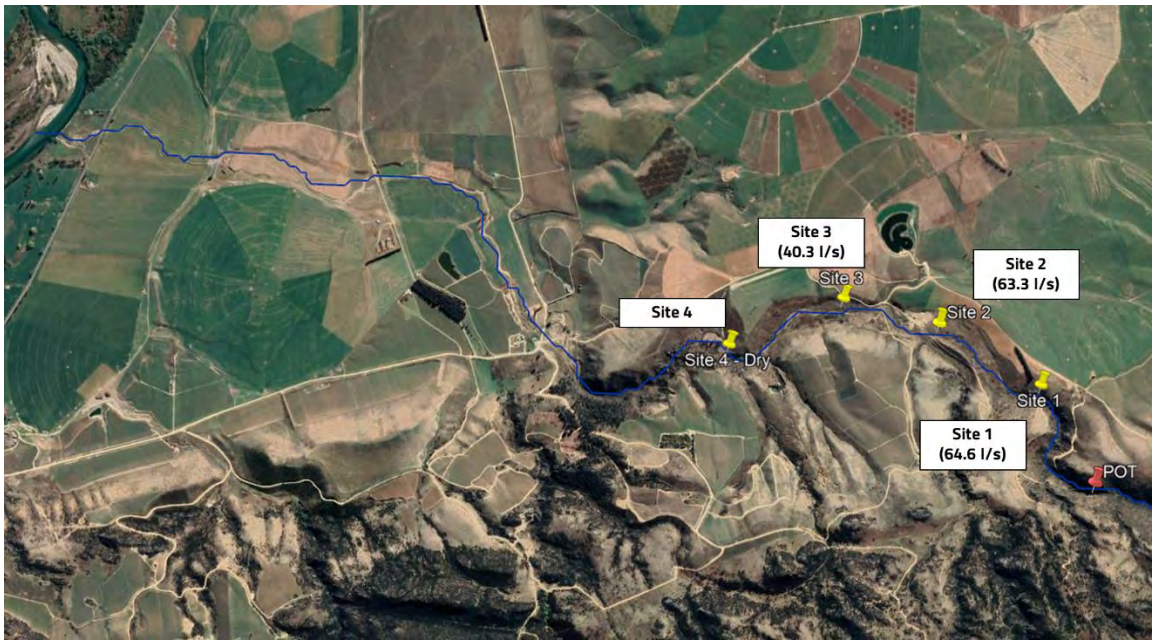


Figure 1 Location of sites (yellow marker) surveyed downstream from Bendigo Station abstraction point (red marker).

The data was collected in accordance with the National Environmental Monitoring Standards code of practice for open channel flow where possible. This data, included in the appendices, has been used on an as-is basis.

Table 2 below summarizes the measured flow on 16th January 2020.

Table 2: Flow gauging results.

Site Name	Measured flow (l/s)	[1]Gauging uncertainty flow range (l/s)	NZTM 2000
Site 1	64.6	62.6 – 66.6	5018624N 1314189E
Site 2	63.6	61.4 – 65.2	5018928N 1313613E
Site 3	40.3	39.0 – 41.6	5019041N 1313116E
Site 4	0		5018871N 1312740E

[1] As with many flow measurements there is a degree of uncertainty and New Zealand Standards use ISO5168:2005 and ISO748:2007 to report on the accuracy of gaugings.

2.2 Flow Losses and Gains

A losing or gaining reach as identified in this assessment refers to the assumption that flow is interacting with the hyporheic zone (sub-surface zone) due to factors such as topography, geology, and geomorphology that control the movement of water, including flow and wetted perimeter. The assessment assumes that this hyporheic water may or may not be specifically linked to groundwater as groundwater level data is not available or not included as part of this assessment. This zone of sub-surface and surface water exchange (hyporheic zone) is relatively active where water ways traverse steep gullies passing down to river valleys and alluvial lowlands. In these types of environments, the hyporheic zone can be more substantial, and the typically porous alluvial media may extend for a larger depth, creating more space for underflow into the sub-surface environment to occur. Under hot dry weather conditions, this water rarely returns to the surface due to intense evaporation processes that occur as water comes to the surface.

Results of the flow gauging's undertaken suggest that flow downstream of the Bendigo Station Ltd abstraction point interact with the hyporheic zone and fine loose alluvial gravels, and that this provides a mechanism for water loss to the sub-surface zone. The survey identified a net loss of 64.6 L/s between the abstraction point and a site located approx. 2.5 km downstream (Figure 1) where Bendigo Creek ran dry. at a gorge where the creek was constrained by bedrock and pools and dense vegetation are present (Figure 2).

Figure 2: Point on Bendigo Creek where flow ceased (16 Jan 2020)

General survey findings:

- The flow in Bendigo Creek downstream of the point of take (Site 1) was measured as 64.6 l/s. As the point of take was turned off for 24hours before, and for the duration of the survey, the flow in the creek was approx. the modelled mean annual low flow (MALF) for the creek (Table 1). The assessment was therefore carried out during typical low flow conditions.
- Flow downstream from Site 1 at Site 2 (approx. 700m) was 63.6 l/s and no different to the flow measured at Site 1.
- Flow downstream from Site 2 at Site 3 (approx. 600m) decreased by 23 l/s, and was recorded as 40.3 l/s. Through this 600m reach of the river the creek passes through 2 fords where flow losses through gravels are likely to occur, the topography flattens, and the alluvial plain adjacent to the river widens as the creek comes out of the steep gorge upstream.
- Downstream from Site 3 at Site 4 (approx. 450m) Bendigo Creek ran dry.

Figure 3: Dry creek bed downstream from gorge on Bendigo Creek, approx. 400 m downstream of where flows ceased (16 January 2020).

The geology of the catchment is variable, with schist geology in the upper headwaters, and alluvium across the lower reaches of Bendigo Creek (Figure 4). Alluvium produces fine alluvial gravels that are typically quite porous and therefore can leak surface water to the sub-surface zone. Therefore this behaviour likely promotes the interaction of surface water with the sub-surface zone in Bendigo Creek. In comparison, schist is a hard metamorphic lithology that is unlikely to pass water to the sub-surface

zone, and likely explains why the observed loss in water occurs downstream of Site 2 where the change is lithology is observed.

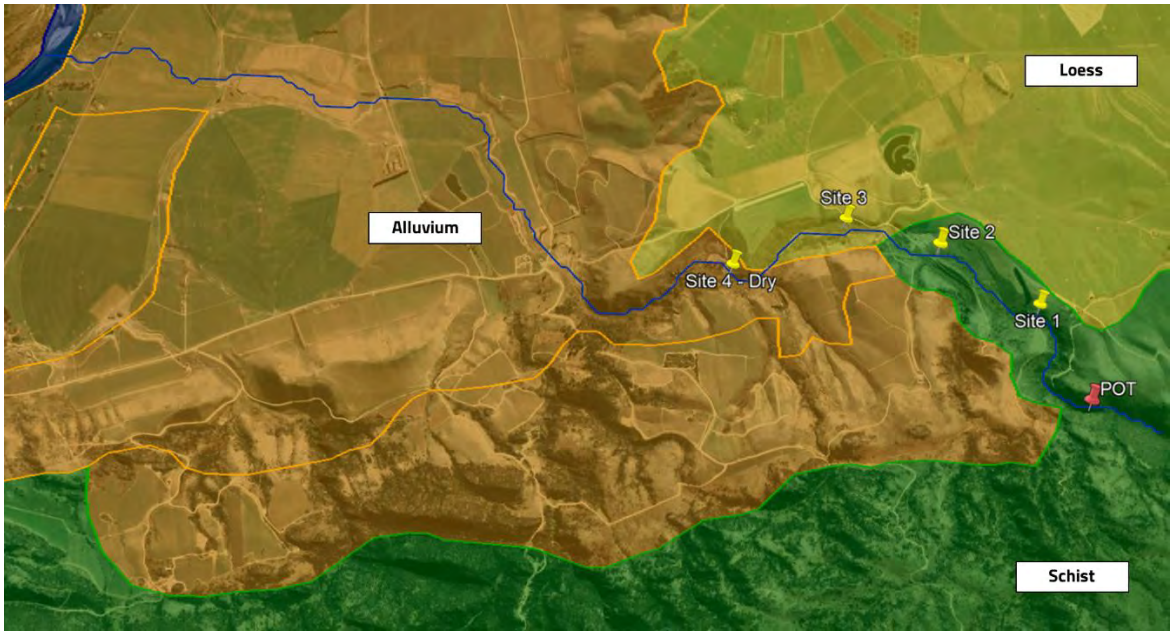


Figure 4 Geology of Bendigo Creek downstream from abstraction point (Source: LRIS Geology).

Historically, Bendigo Creek does not flow to the Clutha River due to flow losses within the catchment. A review of historical imagery suggests that the creek ceases to flow on average 4.5km upstream from the confluence with the Clutha River (see Appendix A). The 16 January 2020 survey identified zero flows approx. 5km upstream from the confluence, consistent with the historical behaviour.

The assessment of historic aerial imagery identified that the dry reach of Bendigo Creek varies seasonally, and can be dry in all seasons (n = the number of observations):

- Summer – 5.1km upstream from confluence (n = 4)
- Autumn – 4.9km upstream from confluence (n = 6)
- Winter – 3.5km upstream from confluence (n= 3)
- Spring – 3.6km upstream from confluence (n=3)

The identified drying reach of Bendigo Creek (Appendix A) where flows are typically observed to run dry is approximately the point in the catchment where the loess lithology changes to alluvium, indicating that the observed flow losses are most likely attributable to the change in lithology, and therefore in this zone there is a surface water interaction with the hyporheic zone of the fine alluvial gravels.

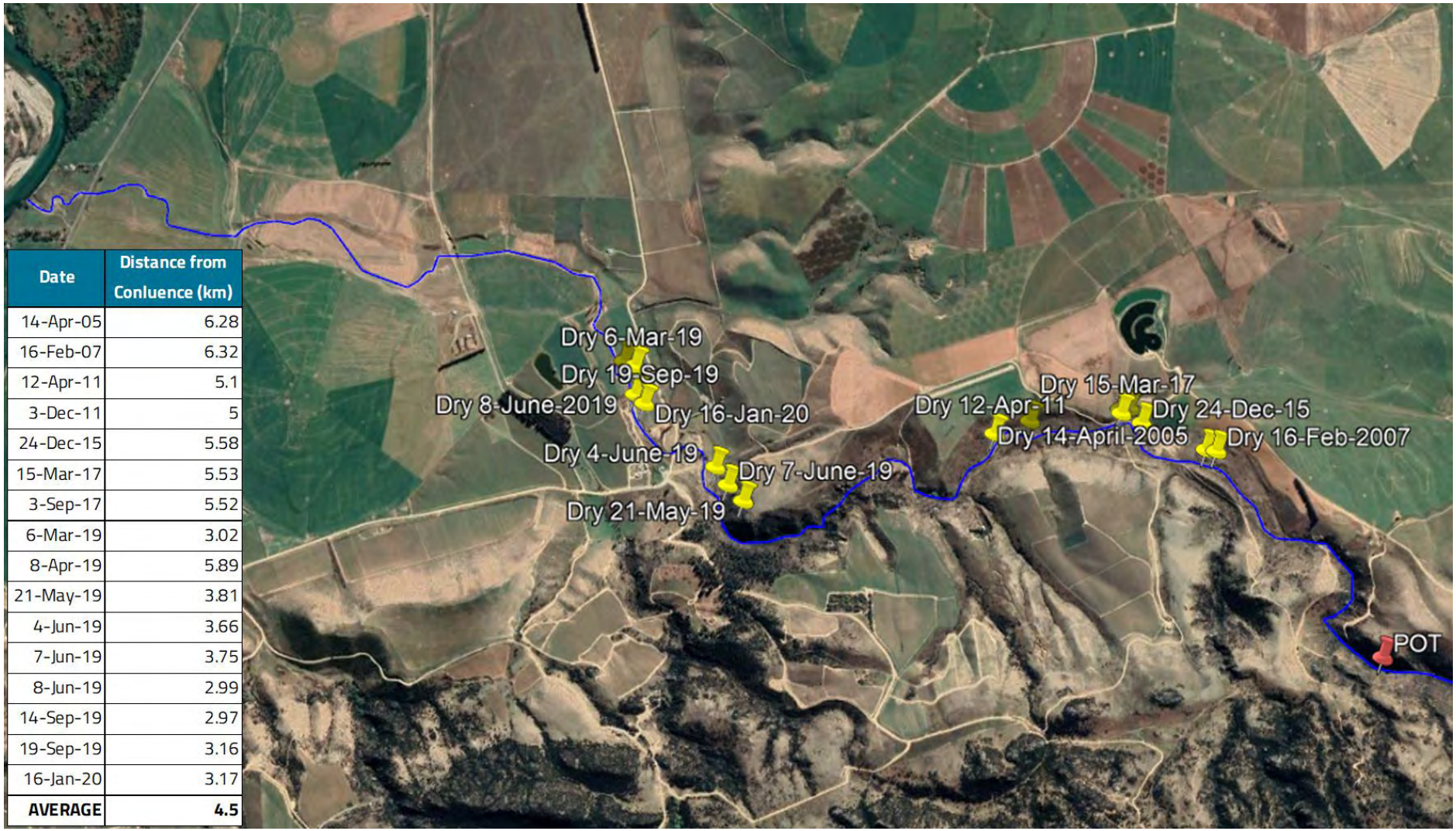
3. Conclusion and Recommendation

It is likely that there are natural flow losses in the Bendigo Creek Catchment due to the alluvium lithology where surface water is likely to interact with the hyporheic zone. The survey identified that when abstraction is not occurring in the catchment, the lithology of the catchment promotes flow losses through the fine alluvial gravels to the subsurface zone. An assessment of historical imagery suggests that Bendigo Creek does not flow to the Clutha River and is a behaviour observed across all seasons, therefore it is unlikely that any abstraction in the catchment would significantly exacerbate these natural flow losses, which are likely to occur regardless of abstraction. Therefore, a staged or small residual flow at the beginning and end of the irrigation season may be beneficial to the hydrology of the creek for a small distance and should be based on any ecological values identified, although this would not provide any benefit to maintaining connectivity with the Clutha River.

Kind Regards,

Christina Bright
Environmental Scientist

Appendix A: Summary Map of Flow Losing Reaches of Bendigo Creek



Date	Distance from Conluence (km)
14-Apr-05	6.28
16-Feb-07	6.32
12-Apr-11	5.1
3-Dec-11	5
24-Dec-15	5.58
15-Mar-17	5.53
3-Sep-17	5.52
6-Mar-19	3.02
8-Apr-19	5.89
21-May-19	3.81
4-Jun-19	3.66
7-Jun-19	3.75
8-Jun-19	2.99
14-Sep-19	2.97
19-Sep-19	3.16
16-Jan-20	3.17
AVERAGE	**4.5**

Appendix A: Figure – Locations where Bendigo Creek has historically been dry as determined by historical aerial imagery from Google Earth.

Appendix B: Flow Gauging Data

Site 1

Site name	Ben1
Site number	BEN1
Operator(s)	Ceb
File name	Ben1_20200116-105528.ft
Comment	

Measurement results

St#	Time	Location (m)	Method	Depth (m)	%Depth	Measured Depth (m)	Samples	Velocity (m/s)	Correction	Mean Velocity (m/s)	Area (m²)	Flow (m³/s)	%Q	
0	10:05 AM	0.000	None	0.000	0.000	0.000	0	0.000		0.000	0.005	0.000	0.000	✓
1	10:06 AM	0.100	0.6	0.090	0.600	0.054	80	0.000	1.000	0.000	0.013	0.000	0.000	✓
2	10:10 AM	0.200	0.6	0.160	0.600	0.096	80	0.000	1.000	0.018	0.021	0.000	0.592	✓
3	10:12 AM	0.300	0.6	0.260	0.600	0.156	80	0.036	1.000	0.075	0.028	0.002	3.264	✓
4	10:17 AM	0.400	0.6	0.300	0.600	0.180	80	0.114	1.000	0.119	0.031	0.004	5.699	✓
5	10:19 AM	0.500	0.6	0.320	0.600	0.192	80	0.123	1.000	0.134	0.032	0.004	6.514	✓
6	10:21 AM	0.600	0.6	0.310	0.600	0.186	80	0.144	1.000	0.129	0.031	0.004	6.076	✓
7	10:23 AM	0.700	0.6	0.300	0.600	0.180	80	0.113	1.000	0.113	0.030	0.003	5.227	✓
8	10:25 AM	0.800	0.6	0.300	0.600	0.180	80	0.112	1.000	0.113	0.030	0.003	5.150	✓
9	10:27 AM	0.900	0.6	0.290	0.600	0.174	80	0.114	1.000	0.093	0.033	0.003	4.751	✓
10	10:29 AM	1.000	0.6	0.370	0.600	0.222	80	0.072	1.000	0.074	0.036	0.003	4.079	✓
11	10:32 AM	1.100	0.6	0.340	0.600	0.204	80	0.076	1.000	0.081	0.035	0.003	4.440	✓
12	10:34 AM	1.200	0.6	0.370	0.600	0.222	80	0.085	1.000	0.100	0.037	0.004	5.674	✓
13	10:35 AM	1.300	0.6	0.360	0.600	0.216	80	0.116	1.000	0.126	0.038	0.005	7.336	✓
14	10:37 AM	1.400	0.6	0.390	0.600	0.234	80	0.137	1.000	0.137	0.040	0.005	8.451	✓
15	10:38 AM	1.500	0.6	0.410	0.600	0.246	80	0.136	1.000	0.125	0.041	0.005	7.840	✓
16	10:40 AM	1.600	0.6	0.400	0.600	0.240	80	0.114	1.000	0.107	0.041	0.004	6.904	✓
17	10:41 AM	1.700	0.6	0.430	0.600	0.258	80	0.101	1.000	0.083	0.042	0.003	5.332	✓
18	10:44 AM	1.800	0.6	0.400	0.600	0.240	80	0.065	1.000	0.047	0.042	0.002	3.042	✓
19	10:45 AM	1.900	0.6	0.440	0.600	0.264	80	0.028	1.000	0.033	0.043	0.001	2.187	✓
20	10:47 AM	2.000	0.6	0.420	0.600	0.252	80	0.038	1.000	0.036	0.042	0.001	2.310	✓
21	10:48 AM	2.100	0.6	0.420	0.600	0.252	80	0.034	1.000	0.045	0.039	0.002	2.720	✓
22	10:50 AM	2.200	0.6	0.360	0.600	0.216	80	0.057	1.000	0.044	0.030	0.001	2.099	✓
23	10:51 AM	2.300	0.6	0.250	0.600	0.150	80	0.032	1.000	0.016	0.013	0.000	0.313	✓
24	10:53 AM	2.400	None	0.000	0.000	0.000	0	0.000		0.000	0.000	0.000	0.000	✓

Site 2

Discharge Measurement Summary

Site name	Ben2
Site number	BEN2
Operator(s)	Ceb
File name	Ben2_20200116-120554.ft
Comment	

Measurement results

St#	Time	Location (m)	Method	Depth (m)	%Depth	Measured Depth (m)	Samples	Velocity (m/s)	Correction	Mean Velocity (m/s)	Area (m²)	Flow (m³/s)	%Q	
0	11:23 AM	0.000	None	0.000	0.000	0.000	0	0.000		0.017	0.010	0.000	0.274	✓
1	11:26 AM	0.200	0.6	0.100	0.600	0.060	80	0.035	1.000	0.066	0.005	0.000	0.497	✓
2	11:29 AM	0.250	0.6	0.090	0.600	0.054	80	0.098	1.000	0.160	0.005	0.001	1.134	✓
3	11:30 AM	0.300	0.6	0.090	0.600	0.054	80	0.221	1.000	0.205	0.011	0.002	3.568	✓
4	11:32 AM	0.400	0.6	0.130	0.600	0.078	80	0.190	1.000	0.255	0.014	0.003	5.445	✓
5	11:33 AM	0.500	0.6	0.140	0.600	0.084	80	0.321	1.000	0.175	0.015	0.003	4.139	✓
6	11:35 AM	0.600	0.6	0.160	0.600	0.096	80	0.028	1.000	0.166	0.016	0.003	4.205	✓
7	11:37 AM	0.700	0.6	0.160	0.600	0.096	80	0.305	1.000	0.335	0.016	0.005	8.473	✓
8	11:39 AM	0.800	0.6	0.160	0.600	0.096	80	0.366	1.000	0.318	0.017	0.005	8.293	✓
9	11:40 AM	0.900	0.6	0.170	0.600	0.102	80	0.270	1.000	0.257	0.018	0.005	7.310	✓
10	11:42 AM	1.000	0.6	0.190	0.600	0.114	80	0.244	1.000	0.218	0.019	0.004	6.542	✓
11	11:43 AM	1.100	0.6	0.190	0.600	0.114	80	0.192	1.000	0.155	0.019	0.003	4.532	✓
12	11:44 AM	1.200	0.6	0.180	0.600	0.108	80	0.118	1.000	0.069	0.018	0.001	1.955	✓
13	11:46 AM	1.300	0.6	0.180	0.600	0.108	80	0.019	1.000	0.020	0.018	0.000	0.547	✓
14	11:47 AM	1.400	0.6	0.170	0.600	0.102	80	0.020	1.000	0.031	0.017	0.001	0.797	✓
15	11:49 AM	1.500	0.6	0.160	0.600	0.096	80	0.041	1.000	0.062	0.017	0.001	1.674	✓
16	11:50 AM	1.600	0.6	0.180	0.600	0.108	80	0.084	1.000	0.107	0.017	0.002	2.797	✓
17	11:51 AM	1.700	0.6	0.150	0.600	0.090	80	0.131	1.000	0.152	0.016	0.002	3.848	✓
18	11:53 AM	1.800	0.6	0.170	0.600	0.102	80	0.174	1.000	0.152	0.017	0.003	4.088	✓
19	11:54 AM	1.900	0.6	0.170	0.600	0.102	80	0.131	1.000	0.143	0.017	0.002	3.738	✓
20	11:55 AM	2.000	0.6	0.160	0.600	0.096	80	0.156	1.000	0.171	0.017	0.003	4.580	✓
21	11:56 AM	2.100	0.6	0.180	0.600	0.108	80	0.185	1.000	0.167	0.018	0.003	4.755	✓
22	11:58 AM	2.200	0.6	0.180	0.600	0.108	80	0.149	1.000	0.232	0.018	0.004	6.768	✓
23	11:59 AM	2.300	0.6	0.190	0.600	0.114	80	0.314	1.000	0.241	0.018	0.004	6.654	✓
24	12:01 PM	2.400	0.6	0.160	0.600	0.096	80	0.167	1.000	0.126	0.014	0.002	2.786	✓
25	12:02 PM	2.500	0.6	0.120	0.600	0.072	80	0.085	1.000	0.042	0.009	0.000	0.601	✓
26	12:04 PM	2.600	None	0.060	0.000	0.000	0	0.000		0.000	0.000	0.000	0.000	✓

Site 3

Discharge Measurement Summary

Site name	Ben3
Site number	BEN3
Operator(s)	Ceb
File name	Ben3_20200116-133211.ft
Comment	

Measurement results

St#	Time	Location (m)	Method	Depth (m)	%Depth	Measured Depth (m)	Samples	Velocity (m/s)	Correction	Mean Velocity (m/s)	Area (m²)	Flow (m³/s)	%Q	
0	1:03 PM	0.000	None	0.000	0.000	0.000	0	0.000		0.001	0.002	0.000	0.005	✓
1	1:03 PM	0.100	0.6	0.040	0.600	0.024	80	0.002	1.000	0.033	0.004	0.000	0.329	✓
2	1:05 PM	0.200	0.6	0.040	0.600	0.024	80	0.064	1.000	0.059	0.006	0.000	0.812	✓
3	1:06 PM	0.300	0.6	0.070	0.600	0.042	80	0.055	1.000	0.108	0.007	0.001	1.886	✓
4	1:07 PM	0.400	0.6	0.070	0.600	0.042	80	0.162	1.000	0.171	0.008	0.001	3.190	✓
5	1:08 PM	0.500	0.6	0.080	0.600	0.048	80	0.180	1.000	0.207	0.008	0.002	4.110	✓
6	1:10 PM	0.600	0.6	0.080	0.600	0.048	80	0.233	1.000	0.291	0.008	0.002	5.781	✓
7	1:11 PM	0.700	0.6	0.080	0.600	0.048	80	0.349	1.000	0.327	0.009	0.003	6.898	✓
8	1:12 PM	0.800	0.6	0.090	0.600	0.054	80	0.305	1.000	0.308	0.010	0.003	7.275	✓
9	1:13 PM	0.900	0.6	0.100	0.600	0.060	80	0.312	1.000	0.156	0.011	0.002	4.263	✓
10	1:14 PM	1.000	0.6	0.120	0.600	0.072	80	0.000	1.000	0.104	0.012	0.001	3.088	✓
11	1:17 PM	1.100	0.6	0.120	0.600	0.072	80	0.207	1.000	0.186	0.012	0.002	5.316	✓
12	1:18 PM	1.200	0.6	0.110	0.600	0.066	80	0.165	1.000	0.255	0.011	0.003	6.655	✓
13	1:19 PM	1.300	0.6	0.100	0.600	0.060	80	0.345	1.000	0.287	0.010	0.003	7.139	✓
14	1:20 PM	1.400	0.6	0.100	0.600	0.060	80	0.230	1.000	0.201	0.011	0.002	5.251	✓
15	1:22 PM	1.500	0.6	0.110	0.600	0.066	80	0.173	1.000	0.239	0.011	0.003	6.228	✓
16	1:23 PM	1.600	0.6	0.100	0.600	0.060	80	0.305	1.000	0.295	0.011	0.003	8.065	✓
17	1:24 PM	1.700	0.6	0.120	0.600	0.072	80	0.286	1.000	0.308	0.012	0.004	8.796	✓
18	1:25 PM	1.800	0.6	0.110	0.600	0.066	80	0.330	1.000	0.283	0.011	0.003	7.730	✓
19	1:27 PM	1.900	0.6	0.110	0.600	0.066	80	0.236	1.000	0.155	0.012	0.002	4.414	✓
20	1:28 PM	2.000	0.6	0.120	0.600	0.072	80	0.073	1.000	0.081	0.011	0.001	2.217	✓
21	1:29 PM	2.100	0.6	0.100	0.600	0.060	80	0.089	1.000	0.044	0.005	0.000	0.552	✓
22	1:31 PM	2.200	None	0.000	0.000	0.000	0	0.000		0.000	0.000	0.000	0.000	✓

Appendix D: Bendigo Creek fish survey report

To: Will Nicolson, Landpro

From: Richard Allibone, Water Ways Consulting Ltd

Date: 10 January 2020

Subject: Bendigo Creek fish survey

Dear Will,

This memo reports the fish survey at three sites on Bendigo Creek and two sites on its tributary Clearwater Creek (Figure 1). The survey was designed to assess the fish community in Bendigo Creek upstream, at and downstream of the water abstraction site operated by Bendigo Station.

The New Zealand Freshwater Fish Database (NZFFD) was also searched for records for Bendigo Creek, but it has no records for Bendigo Creek, so this survey provides the only information on the fish present in the stream.

The survey was conducted on the 28 December 2019 using an EFM 300 backpack electric fishing machine. In addition to the electric fishing survey, observations where undertaken at the four sites in Bendigo Creek for larval galaxiids (Sites 2, 3, 4 and 5). The electric fishing survey fished 30-50 m of stream at each site, aside from Site 1, a small tributary which had no fishable water. Site 2, 3 and 4 where all problematic to electric fishing, Site 3 was overgrown with crack willow trees that impeded the fish survey. Sites 3 and 4 on Bendigo Creek where in a steep gorge section with deep pools and steep cascade sections and the deep pools could not be fished effectively (Figure 1). Site 5 was the most accessible site and was fished continuously for the 50 m section

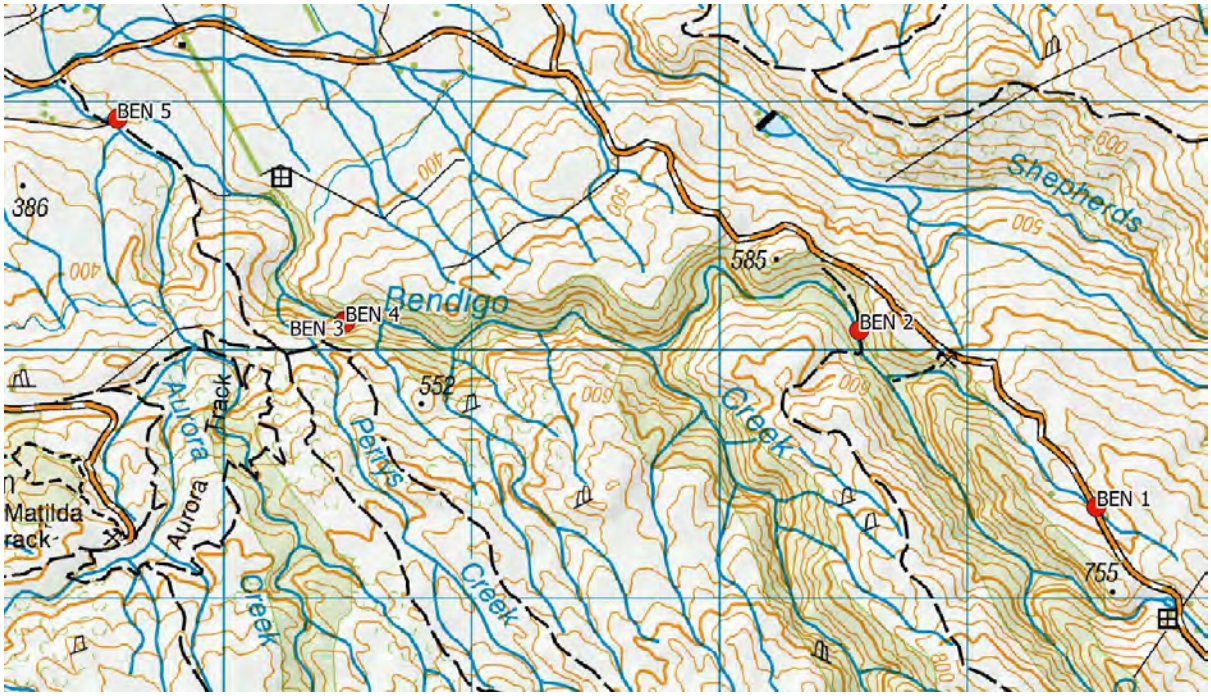


Figure 1: Fish survey locations.

Site 1

Site 1 was a small tributary of Clearwater Creek that is crossed by Thomson Gorge Road. The site is an ephemeral stream with no surface water at the time of this survey (Figure 2).

Figure 2: Site 1, a small Clearwater Creek tributary.

Site 2

Site 2 was on Clearwater Creek along a section of stream lined with crack willow (Figure 3). Willow trees were altering the channel morphology with a stream bed completely covered by willow roots and willow trucks and fallen branches were clogging the channel creating wide (3 m wide) shallow reaches amongst narrower 1 m wide reaches. Pool habitat was rare, and the reach was dominated by shallow runs. The complete coverage of the stream bed by willow roots meant this willow lined reach does not provide spawning habitat for fish such as trout that require spawning gravels and some galaxiids that spawn amongst cobble and boulder substrates.

Sites 3 and 4

Site 3 was immediately upstream of the water intake site (Figure 4) and Site 4 was immediately downstream of the water take site. Both were in steep boulder-dominated habitat with deep pools, and cascades being the dominant habitat. Riffle and run sections were present but were relatively rare. The riparian zone was dominated by shrubs with some willow trees. Gravel and cobble substrates were rare. The pool habitat contained large areas of low velocity habitat that are good for larval galaxiid rearing.

Site 5

Site 5 was a gentle gradient site with run and riffle habitat and a cobble and gravel stream bed (Figure 5). This was the only site were didymo was obvious on the stream bed. Pool habitat was rare, and the maximum water depth was 0.25 m, much shallower than the upstream Sites 3 and 4.

Figure 3: Site 2 in Clearwater Creek.

Figure 4: Site 3, upstream of the water intake on Bendigo Creek.

Figure 5: Site 5 on Bendigo Creek.

Survey Results

Brown trout were the only fish species collected and trout were only present in low numbers (n = 5) at Site 5. Four of the five trout caught were 40-55 mm long, fry hatched earlier this year and single larger individual 160 mm long was caught. The overall fish density was very low and lack of larger adult fish indicates that this section of stream contains very few trout and the population consists of small brown trout.

Larval galaxiid surveys at Sites 3, 4 and 5 saw no larval galaxiids. Given the lack of any adult galaxiids at any of the survey sites, even when no salmonids were present, this indicates that Bendigo Creek is unlikely to contain the rare Clutha flathead, and there is certainly no evidence it is present at the water take or downstream of that point.

The lack of fish at the upstream Sites 2 to 4 indicates there is a barrier to fish movement from the lower reaches at Site 5 to Sites 3 and 4. The reach in between Sites 4 and 5 is steep and bedrock bluffs are common (Figure 6). It is expected in this reach there is a waterfall barrier or barriers that prevent upstream fish movement.

It was also noted that Bendigo Creek approximately 2.5 km downstream of Site 5 was dry at the Loop Road crossing point. This indicates the stream loses water to groundwater as it flows across the alluvial deposits in the lower reaches and that fish passage from the Clutha River is impeded by this dry section.

Residual Flow Recommendations

There is no fish population present at the take point and the brown trout population present in Bendigo Creek is limited to a reach below the gorge observed downstream of Site 4 to the drying reach observed at Loop Road. The trout population sampled also indicates that Site 5 provides poor trout habitat and it is possible during summer low flow this site has little useable habitat. The presence of didymo at Site 5 also adds to the site degradation as didymo infestations also reduce the quality of macroinvertebrate communities. It was also notable that a dry reach was present in Bendigo Creek at Loop Road and the lack of flow in this area indicates a substantial flow is required

to provide connectivity with the Clutha River. It is possible that this reach dries naturally during summer low flows.

Figure 6: Looking downstream into a steep gorge section of Bendigo Creek between sites 4 and 5.

At the point of take the intake structure does not collect all the water present in the stream and a smaller flow was maintained downstream of the take point (at Site 4). This provides habitat for macroinvertebrates and maintains flow connectivity through the abstraction point. Therefore, a residual flow is recommended for the water take that maintains a continuous flow through the abstraction site, as is currently provided via leakage through the intake weir.

If you have queries regarding this assessment please contact Richard Allibone by phone 03-4544849, 021 904950 or by email at waterwayscon@gmail.com.

Regards

Richard Allibone

Appendix E: Aqualinc calculations

Site:	Bendigo Station	Sub-region	Central and Lakes District

	Land use	Soil type	Area (ha)	MAR Zone	Smaps PAW	Aqualinc PAW	peak daily demand (mm/day)	peak daily demand (m^3)	maximum monthly demand (mm/month)	maximum monthly demand (m^3)	90%ile annual demand (mm/year)	90%ile annual demand (m^3)	100%ile annual demand (mm/year)	100%ile annual demand (m^3)
1	Pasture	MOLYNEUX	14.20	450	30	40	5.5	781.0	171	24,282	820	116,440	919	130498.00
2	Pasture	CLYDE	74.30	450	42	40	5.5	4086.5	171	127,053	820	609,260	919	682817.00
3	Pasture	ARDGOUR	11.00	450	40	40	5.5	605.0	171	18,810	820	90,200	919	101090.00
4	Pasture	LOWBURN	0.50	450	36	40	5.5	27.5	171	855	820	4,100	919	4595.00
5	Vineyard	MOLYNEUX	3.40	450	36	40	2.4	82.3	75	2,550	239	8,126	293	9962.00
6	Vineyard	CLYDE	3.70	450	42	40	2.4	89.5	75	2,775	239	8,843	293	10841.00
7	Vineyard	ASSUMED ADRGOUR	75.30	450	40	40	2.4	1822.3	75	56,475	239	179,967	293	220629.00
		Total	**182.4**					***5,672***		***176,325***		***836,969***		***939,803***

65.65 L/s

Volume	Daily (m^3)	Monthly (m^3)	Annual (m^3)
Required (per Aqualinc calcs)	5,672	176,325	836,969
Current total paper allocation	7,200[1]	219,000[2]	2,628,000
Stock drinking requirements[3]	103	3,118	37,413
Domestic requirements[4]	1	30	365
Pond maintenance			25,854
Volume sought	**5,776**	**179,473**	**900,601**

Appendix F: Records of Title

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **841226**
Land Registration District **Otago**
Date Issued 01 November 2018

Prior References
808255

Estate	Fee Simple
Area	71.7262 hectares more or less
Legal Description	Lot 1 Deposited Plan 525495 and Section 7 Survey Office Plan 24641

Registered Owners
Bendigo Station Limited

Interests

Subject to Section 11 Crown Minerals Act 1991 (affects Section 7 SO 24641, part Lot 1 DP 525495 formerly Sections 6, 8 SO 24641)

Subject to Part IVA Conservation Act 1987 (affects Section 7 SO 24641, part Lot 1 DP 525495 formerly Sections 6, 8 SO 24641)

Irrigation Agreement under the Public Works Amendment Act 1910 (affects Section 7 SO 24641, part Lot 1 DP 525495 formerly Sections 6, 8 SO 24641)

5009824.9 Conservation Covenant pursuant to Section 77 Reserves Act 1977 - 2.10.2000 at 2:44 pm (affects Section 7 SO 24641, part Lot 1 DP 525495 formerly Sections 6, 8 SO 24641)

Appurtenant to part Lot 1 DP 525495 formerly Lot 3 DP 311382 is a right to pump and convey water, right to occupy bore and a right to convey electricity created by Transfer 5292258.1 - 23.7.2002 at 9:20 am

5587873.8 Esplanade Strip Instrument pursuant to Section 232 Resource Management Act 1991 - 15.5.2003 at 9:00 am (affects part Lot 1 DP 525495 formerly Lot 3 DP 311382)

7780662.6 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 11.4.2008 at 9:00 am (affects Lot 1 DP 525495)

Subject to a right of way (in gross) over part Lot 1 DP 525495 marked J, S, T, & DA on DP 525495 and a right of way (pedestrian access only) over part Lot 1 DP 525495 marked H, P, R, S & DA on DP 525495 in favour of Her Majesty the Queen created by Easement Instrument 7780662.9 - 11.4.2008 at 9:00 am

The easements created by Easement Instrument 7780662.9 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right of way over part Lot 1 DP 525495 marked DA on DP 525495 created by Easement Instrument 7780662.10 - 11.4.2008 at 9:00 am

The easements created by Easement Instrument 7780662.10 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right (in gross) to convey water over part Section 7 SO 24641 marked C on DP 391334 and a right (in gross) to convey water over part Lot 1 DP 525495 marked G, H, I and J on DP 525495 in favour of Schoolhouse Terrace Service Company Limited created by Easement Instrument 7780662.11 - 11.4.2008 at 9:00 am

Land Covenant in Easement Instrument 7780662.13 - 11.4.2008 at 9:00 am (affects Lot 1 DP 525495)

Appurtenant hereto is a right to convey electricity created by Easement Instrument 10539860.7 - 8.9.2016 at 9:26

Identifier **841226**

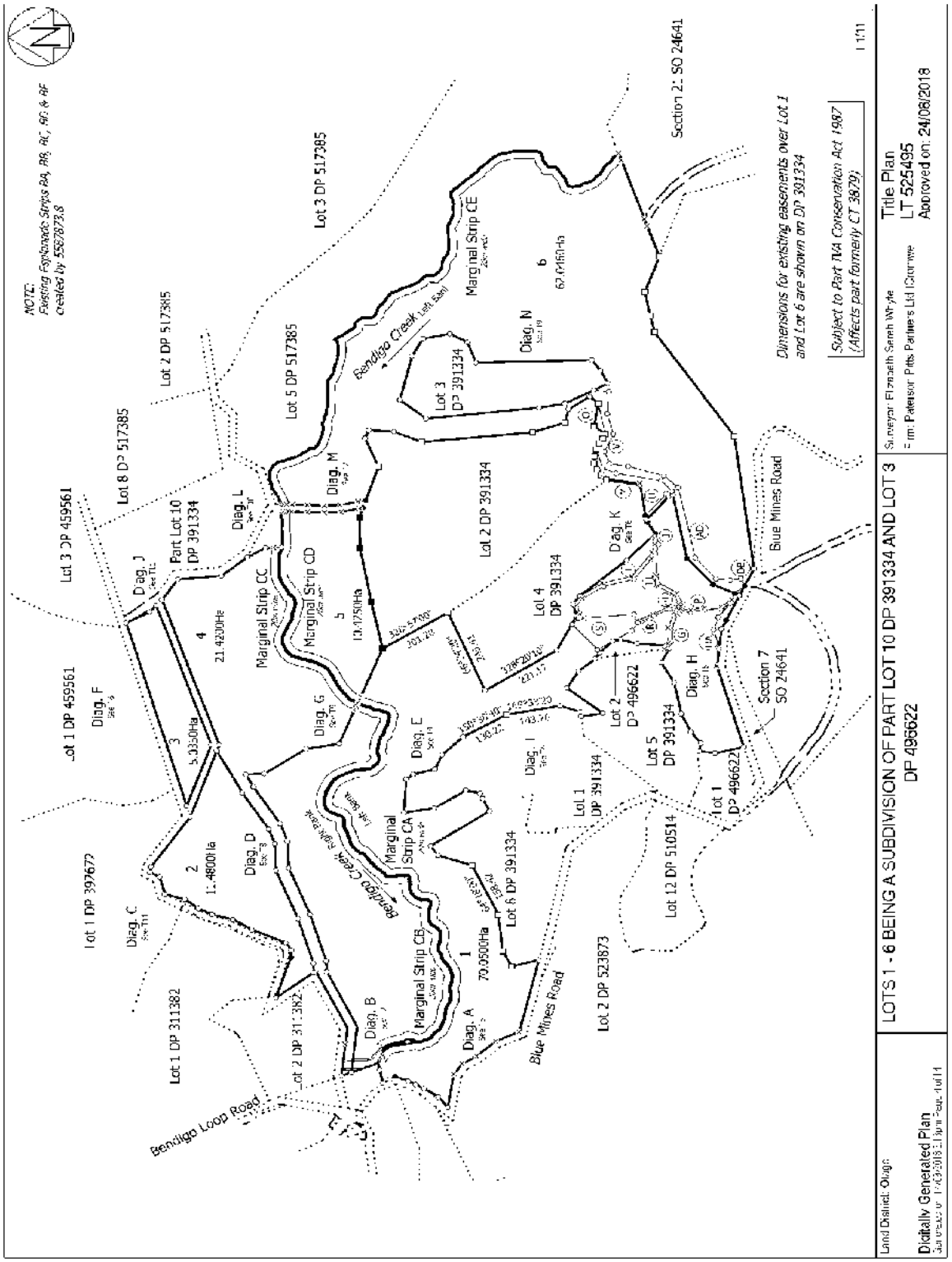
am

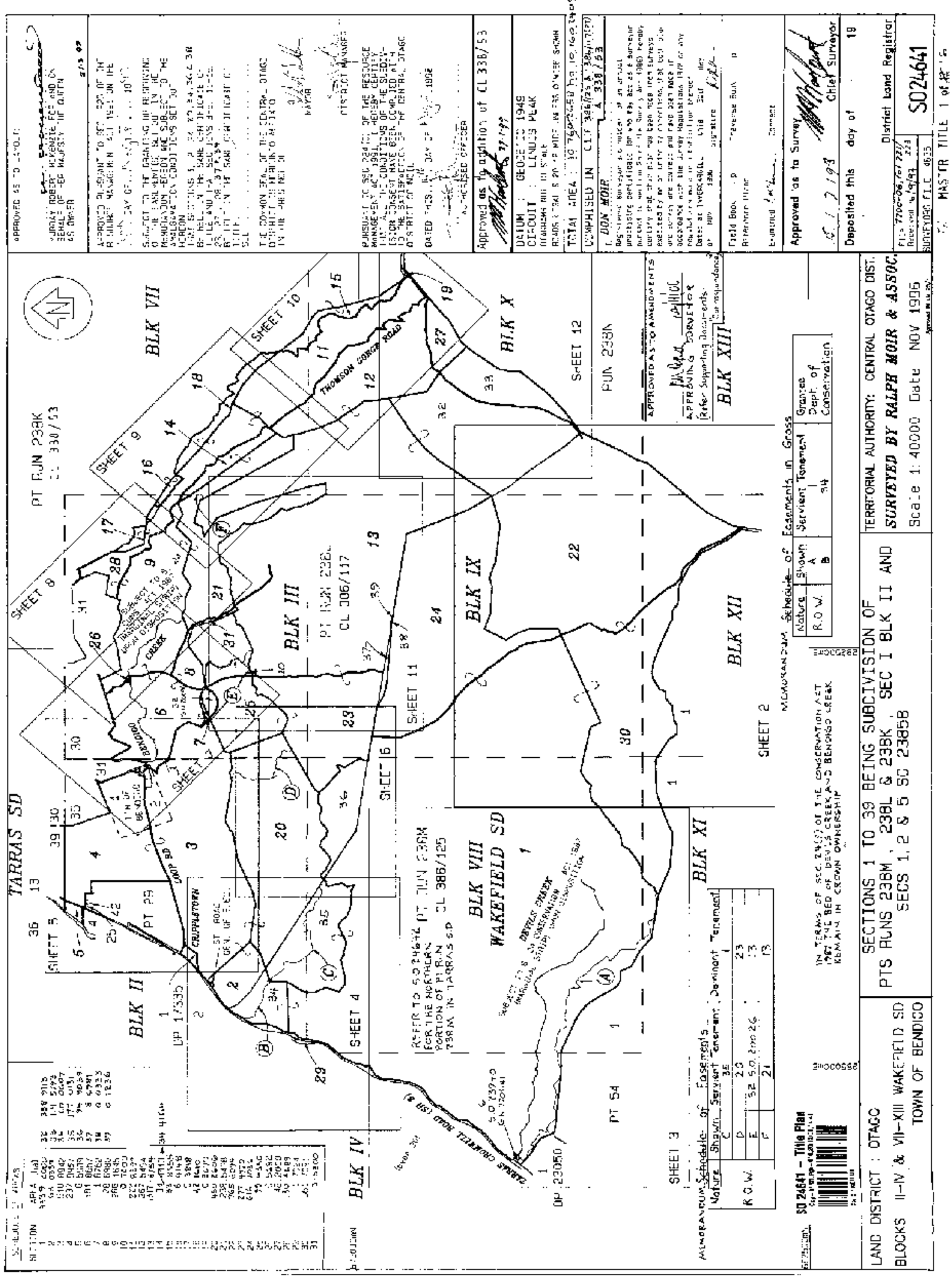
10591681.12 Mortgage to Bank of New Zealand - 3.11.2016 at 2:33 pm

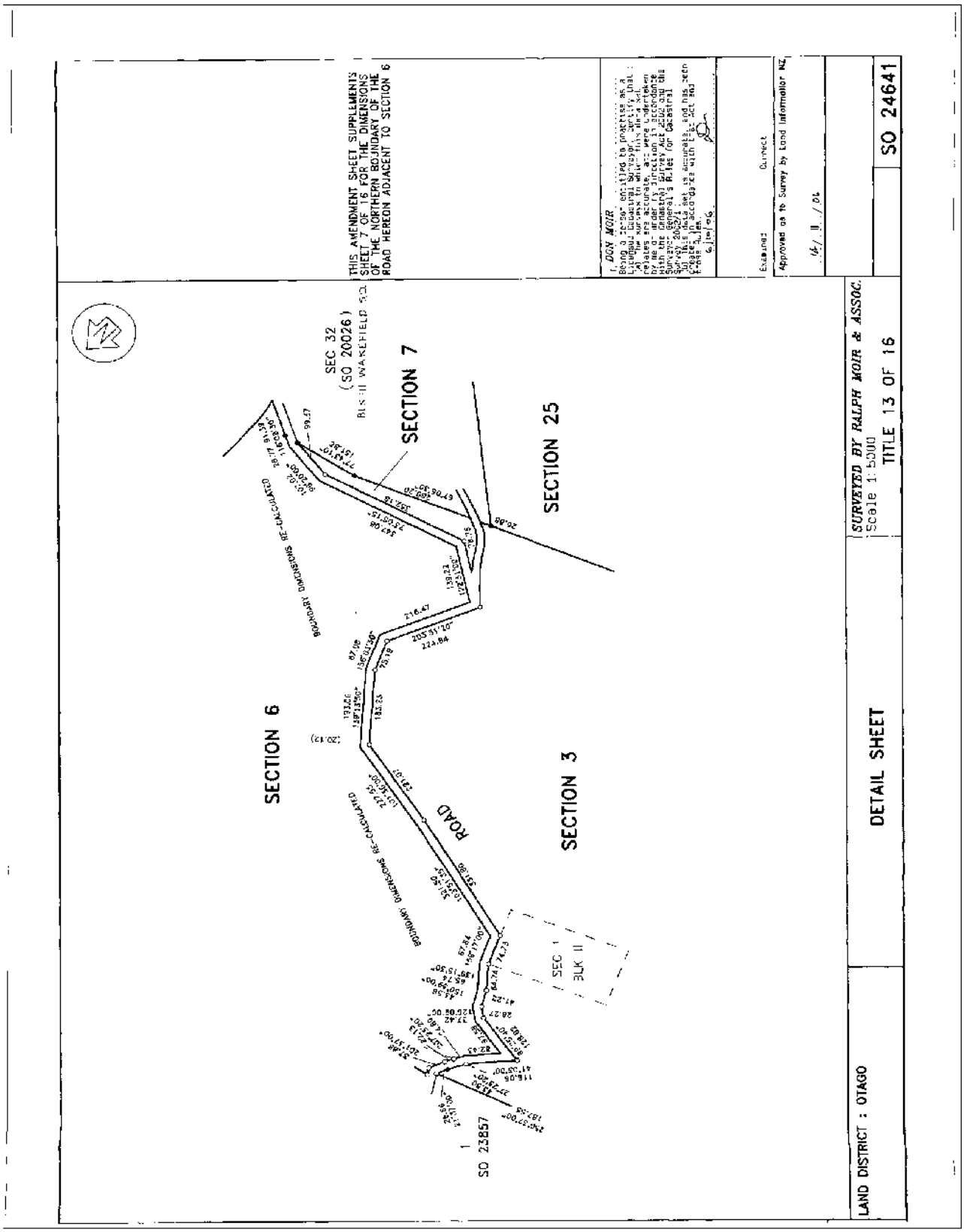
11260401.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 1.11.2018 at 1:43 pm (affects Lot 1 DP 525495)

11260401.4 Esplanade Strip Instrument pursuant to Section 232 Resource Management Act 1991 - 1.11.2018 at 1:43 pm (affects Lot 1 DP 525495)

Subject to Section 241(2) Resource Management Act 1991 (affects DP 525495)


NOTE:
Existing Easements Strips BA, BB, BC, BD & BF created by 5587873.8
Lot 3 DP 459561
Lot 1 DP 459561
Lot 8 DP 517385
Lot 2 DP 517385
Lot 3 DP 517385
Lot 5 DP 517385
Section 2: SO 24641
Lot 1 DP 397672
Lot 1 DP 311382
Lot 2 DP 311382
Bendigo Loop Road
Bendigo Creek (Left Bank)
Bendigo Creek (Right Bank)
Blue Mines Road
Lot 2 DP 523873
Lot 12 DP 510514
Section 7 SO 24641
Lot 1 DP 496622
Lot 2 DP 496622
Lot 5 DP 391334
Lot 1 DP 391334
Lot 6 DP 391334
Lot 4 DP 391334
Lot 2 DP 391334
Lot 3 DP 391334
Part Lot 10 DP 391334
Diag. A
Diag. B
Diag. C
Diag. D
Diag. E
Diag. F
Diag. G
Diag. H
Diag. I
Diag. J
Diag. K
Diag. L
Diag. M
Diag. N
Marginal Strip CA
Marginal Strip CB
Marginal Strip CC
Marginal Strip CD
Marginal Strip CE
1 70.9500Ha
2 1.4800Ha
3 3.0350Ha
4 21.4200Ha
5 13.1750Ha
6 67.6460Ha
Dimensions for existing easements over Lot 1 and Lot 6 are shown on DP 391334
Subject to Part IVA Conservation Act 1987 (Affects part formerly CT 3879)
1 1/1
Land District: Otago
Digitally Generated Plan
LOTS 1 - 6 BEING A SUBDIVISION OF PART LOT 10 DP 391334 AND LOT 3 DP 496622
Surveyor: Elizabeth Sarah Wyatt
Firm: Paterson Pitts Partners Ltd (Dunedin)
Title Plan
LT 525495
Approved on: 24/08/2018


TARRAS SD
PT RUN 238K
CL 338/53
BLK II
BLK III
BLK IV
BLK VII
BLK VIII
WAKEFIELD SD
BLK IX
BLK X
BLK XI
BLK XII
BLK XIII
PT RUN 238L
CL 306/117
PT RUN 238M
CL 386/125
RUN 238N
REFER TO S.O.24694 FOR THE NORTHERN PORTION OF PT RUN 238M IN TARRAS S.D
THOMSON GORGE ROAD
TARRAS CROMWELL ROAD (SH 8)
CRIPPLESTOWN
DEVILS CREEK
SHEET 2
SHEET 3
SHEET 4
SHEET 5
SHEET 6
SHEET 8
SHEET 9
SHEET 10
SHEET 11
SHEET 12
DP 17335
DP 23050
PT 54
PT 29
MEMORANDUM Schedule of Easements
Nature | Shown | Servient Tenement | Dominant Tenement
R.O.W. | C | 35 | 1
D | 20 | 23
E | 32 S.O. 20026 | 13
F | 21 | 13
MEMORANDUM Schedule of Easements in Gross
Nature | Shown | Servient Tenement | Grantee
R.O.W. | A B | 1 34 | Dept. of Conservation
IN TERMS OF SEC. 24(?) OF THE CONSERVATION ACT 1987 THE BED OF DEVILS CREEK AND BENDIGO CREEK REMAIN IN CROWN OWNERSHIP
APPROVED AS TO AMENDMENTS
APPROVING SURVEYOR
Refer Supporting Documents
Approved as to addition of CL 338/53
DATUM : GEODETIC 1949
CIRCUIT : LINDIS PEAK
TOTAL AREA
COMPRISED IN CT 386/125 & 386/(?) CL 338/53
DON MOIR
Approved as to Survey
Chief Surveyor
Deposited this day of 19
District Land Registrar
SO 24641 – Title Plan
LAND DISTRICT : OTAGO
BLOCKS II–IV & VII–XIII WAKEFIELD SD
TOWN OF BENDIGO
SECTIONS 1 TO 39 BEING SUBDIVISION OF
PTS RUNS 238M, 238L & 238K, SEC I BLK II AND
SECS 1, 2 & 5 SO 23858
TERRITORIAL AUTHORITY: CENTRAL OTAGO DIST.
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:40000 Date NOV 1996
SO24641
MASTER TITLE


SO 24641
LAND DISTRICT : OTAGO
DETAIL SHEET
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:5000
TITLE 13 OF 16
THIS AMENDMENT SHEET SUPPLEMENTS SHEET 7 OF 16 FOR THE DIMENSIONS OF THE NORTHERN BOUNDARY OF THE ROAD HEREON ADJACENT TO SECTION 6
I, DON MOIR
Examined
Correct
Approved as to Survey by Land Information NZ
SECTION 6
SECTION 7
SECTION 25
SECTION 3
ROAD
SEC 32
(SO 20026)
BLK III WAKEFIELD SD
BOUNDARY DIMENSIONS RE-CALCULATED
SEC 1
BLK II
1
SO 23857

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **841227**
Land Registration District **Otago**
Date Issued 01 November 2018

Prior References
808255

Estate	Fee Simple
Area	23.0900 hectares more or less
Legal Description	Lot 2-3 Deposited Plan 525495 and Lot 2 Deposited Plan 311382

Registered Owners
Bendigo Station Limited

Interests

Subject to Section 11 Crown Minerals Act 1991 (affects Lots 2-3 DP 525495 and part Lot 2 DP 311382 formerly Section 6 SO 24641)

Subject to Part IVA Conservation Act 1987 (affects Lots 2-3 DP 525495 and part Lot 2 DP 311382 formerly Section 6 SO 24641)

Irrigation Agreement under the Public Works Amendment Act 1910 (affects Lots 2-3 DP 525495 and part Lot 2 DP 311382 formerly Section 6 SO 24641)

5009824.9 Conservation Covenant pursuant to Section 77 Reserves Act 1977 - 2.10.2000 at 2:44 pm (affects Lots 2-3 DP 525495 and part Lot 2 DP 311382 formerly Section 6 SO 24641)

Appurtenant to Lot 2 DP 311382 is a right to pump and convey water, right to occupy bore and a right to convey electricity created by Transfer 5292258.1 - 23.7.2002 at 9:20 am

5587873.8 Esplanade Strip Instrument pursuant to Section 232 Resource Management Act 1991 - 15.5.2003 at 9:00 am (affects Lot 2 DP 311382)

7780662.6 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 11.4.2008 at 9:00 am (affects Lots 2-3 DP 525495)

Land Covenant in Easement Instrument 7780662.13 - 11.4.2008 at 9:00 am (affects Lots 2-3 DP 525495)

Appurtenant hereto is a right to convey electricity created by Easement Instrument 10539860.7 - 8.9.2016 at 9:26 am

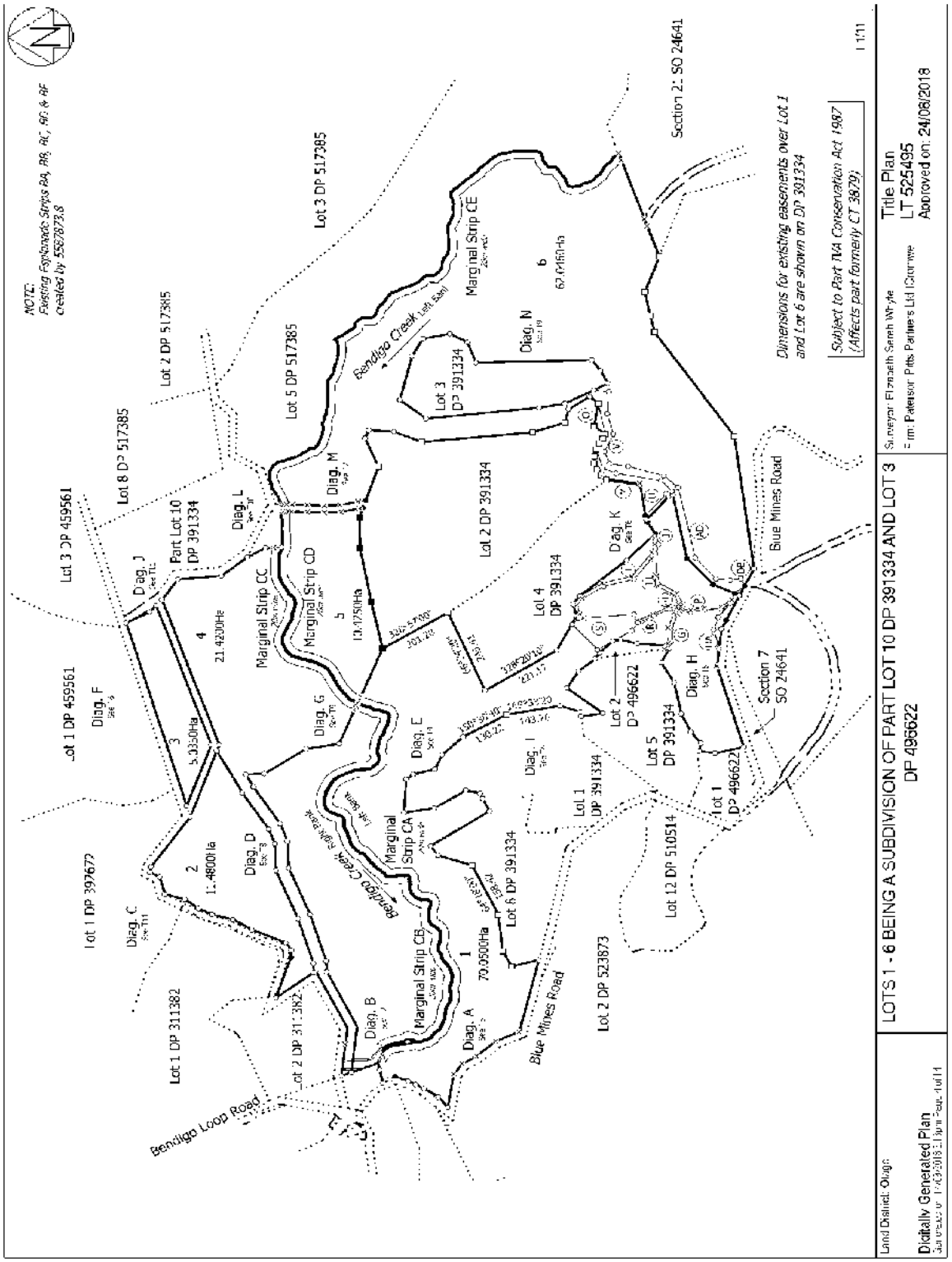
10591681.12 Mortgage to Bank of New Zealand - 3.11.2016 at 2:33 pm

11260401.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 1.11.2018 at 1:43 pm (affects Lots 2-3 DP 525495)

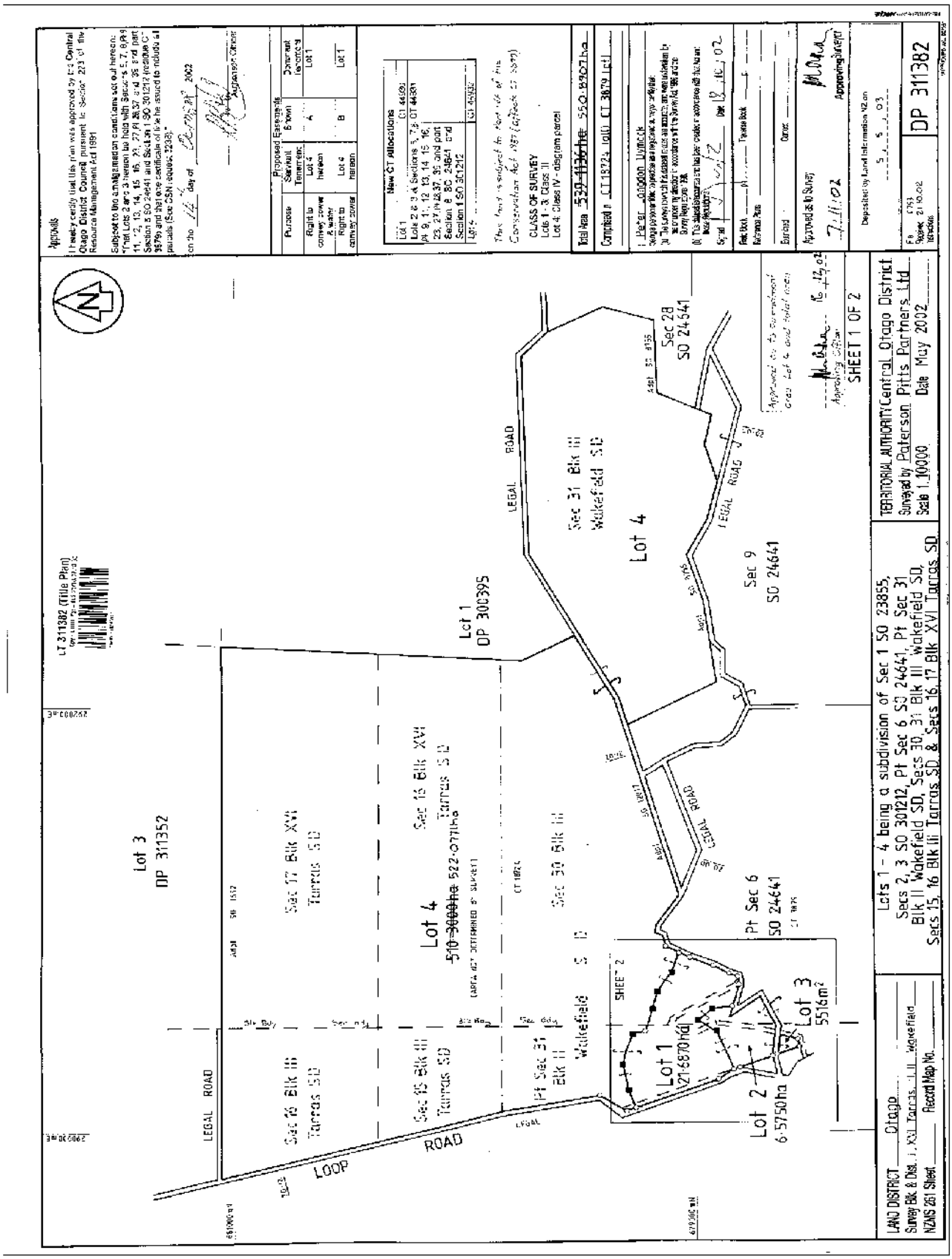
Subject to Section 241(2) Resource Management Act 1991 (affects DP 525495)

Subject to a right (in gross) to convey electricity over part Lot 2 DP 311382 marked J, K, L and N and part Lot 2 DP 525495 marked Q and part Lot 3 DP 525495 marked T and a right to transform electricity over part Lot 2 DP 311382 marked N all on DP 529160 in favour of Aurora Energy Limited created by Easement Instrument 11462172.5 - 14.10.2019 at 10:40 am

Subject to a right (in gross) to convey telecommunications and water over part Lot 2 DP 311382 marked J, M, N, O and part Lot 2 DP 525495 marked P all on DP 529160 in favour of Shine Irrigation Company Limited created by Easement Instrument 11462172.6 - 14.10.2019 at 10:40 am


NOTE:
Existing Easements Strips BA, BB, BC, BD & BF created by 5587873.8
Lot 1 DP 459561
Lot 3 DP 459561
Lot 8 DP 517385
Lot 2 DP 517385
Lot 3 DP 517385
Lot 5 DP 517385
Section 2: SO 24641
Lot 1 DP 397672
Lot 1 DP 311382
Lot 2 DP 311382
Bendigo Loop Road
Bendigo Creek
Bendigo Creek (Left Bank)
Blue Mines Road
Lot 2 DP 523873
Lot 12 DP 510514
Lot 2 DP 391334
Lot 3 DP 391334
Lot 4 DP 391334
Lot 5 DP 391334
Lot 6 DP 391334
Lot 1 DP 391334
Part Lot 10 DP 391334
Lot 1 DP 496622
Lot 2 DP 496622
Section 7 SO 24641
Diag. A
Diag. B
Diag. C
Diag. D
Diag. E
Diag. F
Diag. G
Diag. H
Diag. I
Diag. J
Diag. K
Diag. L
Diag. M
Diag. N
Marginal Strip CA
Marginal Strip CB
Marginal Strip CC
Marginal Strip CD
Marginal Strip CE
1 70.0500Ha
2 1.4800Ha
3 3.0350Ha
4 21.4200Ha
5 13.1750Ha
6 67.6160Ha
Dimensions for existing easements over Lot 1 and Lot 6 are shown on DP 391334
Subject to Part IVA Conservation Act 1987 (Affects part formerly CT 3879)
1 1/1
Land District: Otago
Digitally Generated Plan
LOTS 1 - 6 BEING A SUBDIVISION OF PART LOT 10 DP 391334 AND LOT 3 DP 496622
Surveyor: Elizabeth Sarah White
Firm: Paterson Pitts Partners Ltd (Dunedin)
Title Plan
LT 525495
Approved on: 24/08/2018

Identifier **841227**



RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **841228**
Land Registration District **Otago**
Date Issued 01 November 2018

Prior References
808255

Estate	Fee Simple
Area	237.4312 hectares more or less
Legal Description	Lot 4-6 Deposited Plan 525495 and Part Lot 10 Deposited Plan 391334 and Lot 5 Deposited Plan 517385

Registered Owners
Bendigo Station Limited

Interests

Subject to Section 11 Crown Minerals Act 1991 (affects part Lot 10 DP 391334, Lot 5 DP 517385, Lot 5 DP 525495 and part Lots 4 and 6 DP 525495 formerly Section 6 and 8 SO 24641)

Subject to Part IVA Conservation Act 1987 (affects part Lot 10 DP 391334, Lot 5 DP 517385, Lot 5 DP 525495 and part Lots 4 and 6 DP 525495 formerly Section 6 and 8 SO 24641)

Irrigation Agreement under the Public Works Amendment Act 1910 (affects part Lot 10 DP 391334, Lot 5 DP 517385, Lot 5 DP 525495 and part Lots 4 and 6 DP 525495 formerly Section 6 and 8 SO 24641)

5009824.9 Conservation Covenant pursuant to Section 77 Reserves Act 1977 - 2.10.2000 at 2:44 pm (affects part Lot 10 DP 391334, Lot 5 DP 517385 and part Lots 4 and 6 DP 525495 formerly Section 6 and 8 SO 24641)

Appurtenant to part Lot 4 DP 525495 formerly Lot 3 DP 311382 is a right to pump and convey water, right to occupy bore and a right to convey electricity created by Transfer 5292258.1 - 23.7.2002 at 9:20 am

5587873.8 Esplanade Strip Instrument pursuant to Section 232 Resource Management Act 1991 - 15.5.2003 at 9:00 am (affects part Lot 4 DP 525495 formerly Lot 3 DP 311382)

7780662.6 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 11.4.2008 at 9:00 am

Subject to a right of way (in gross) over part Lot 6 DP 525495 marked DB, U and AD on DP 525495 and a right of way (pedestrian access only) over part Lot 6 DP 525495 marked DB on DP 525495 in favour of Her Majesty the Queen created by Easement Instrument 7780662.9 - 11.4.2008 at 9:00 am

The easements created by Easement Instrument 7780662.9 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right of way over part Lot 6 DP 525495 marked V, U, AD and DB on DP 525495 created by Easement Instrument 7780662.10 - 11.4.2008 at 9:00 am

The easements created by Easement Instrument 7780662.10 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right (in gross) to convey water over part Lot 6 DP 525495 marked M, O & V on DP 525495 in favour of Schoolhouse Terrace Service Company Limited created by Easement Instrument 7780662.11 - 11.4.2008 at 9:00 am

Land Covenant in Easement Instrument 7780662.13 - 11.4.2008 at 9:00 am

Appurtenant hereto is a right to convey electricity created by Easement Instrument 10539860.7 - 8.9.2016 at 9:26

Identifier **841228**

am

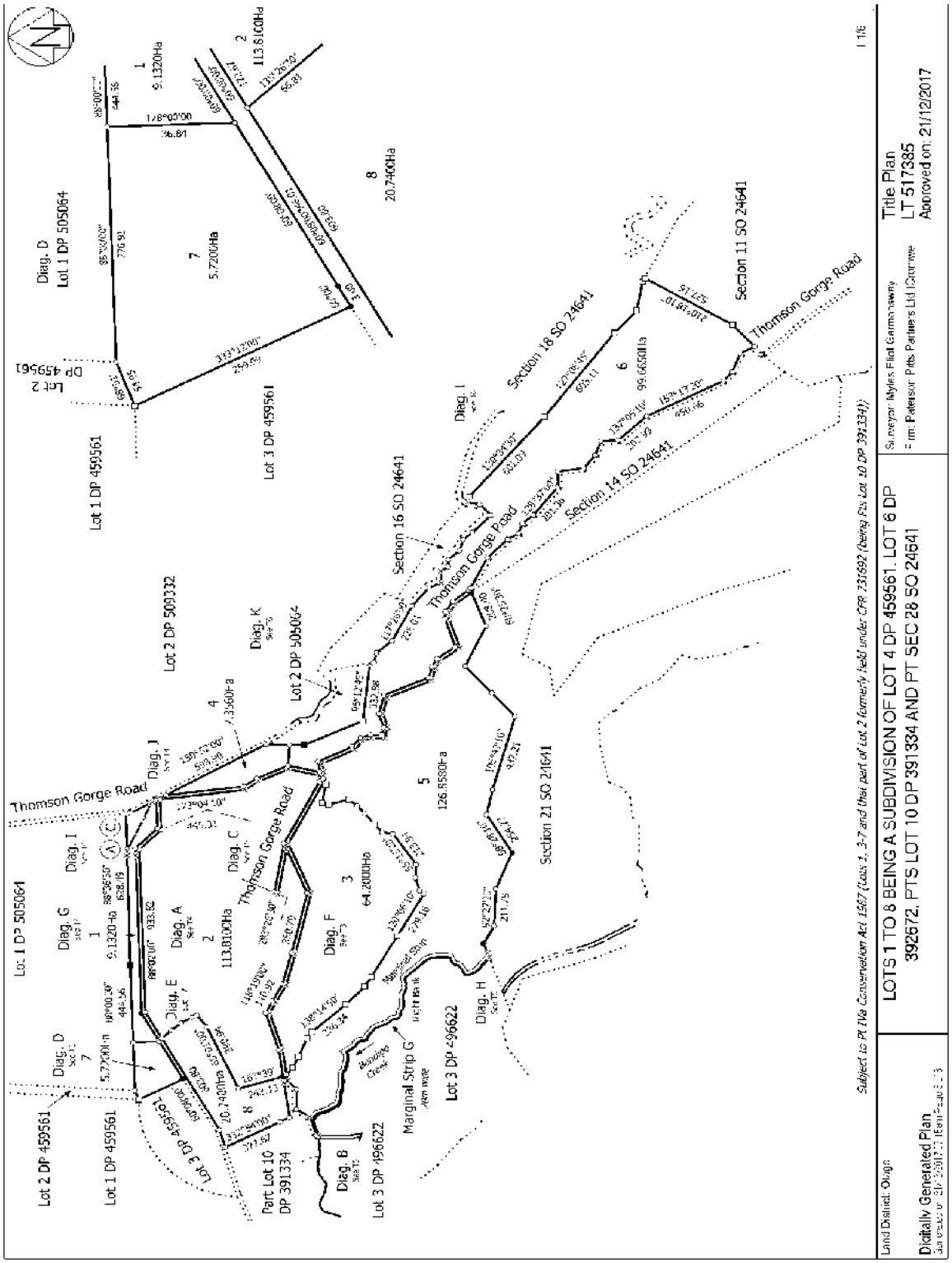
10591681.12 Mortgage to Bank of New Zealand - 3.11.2016 at 2:33 pm

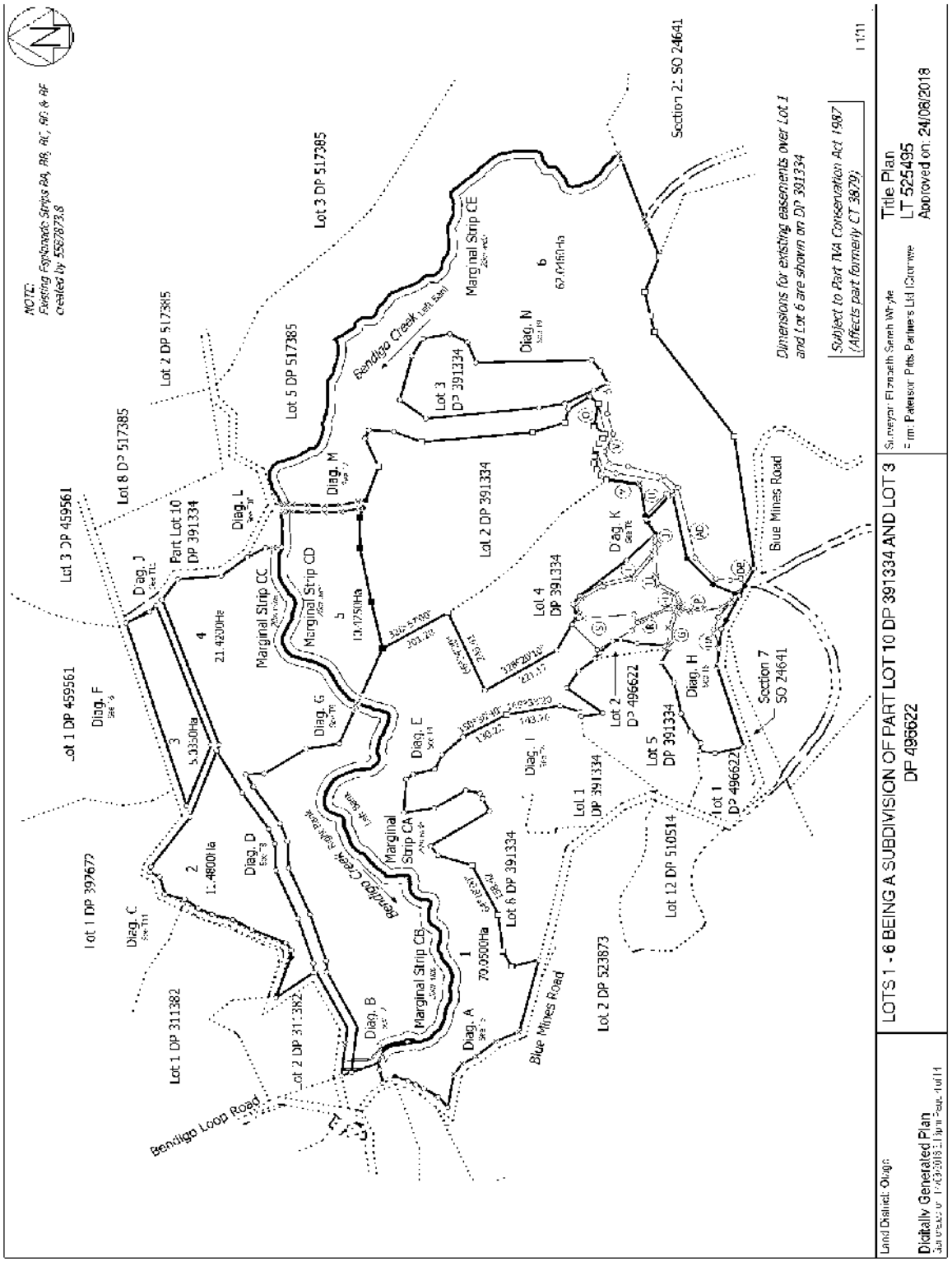
11260401.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 1.11.2018 at 1:43 pm (affects Lot 4-6 DP 525495)

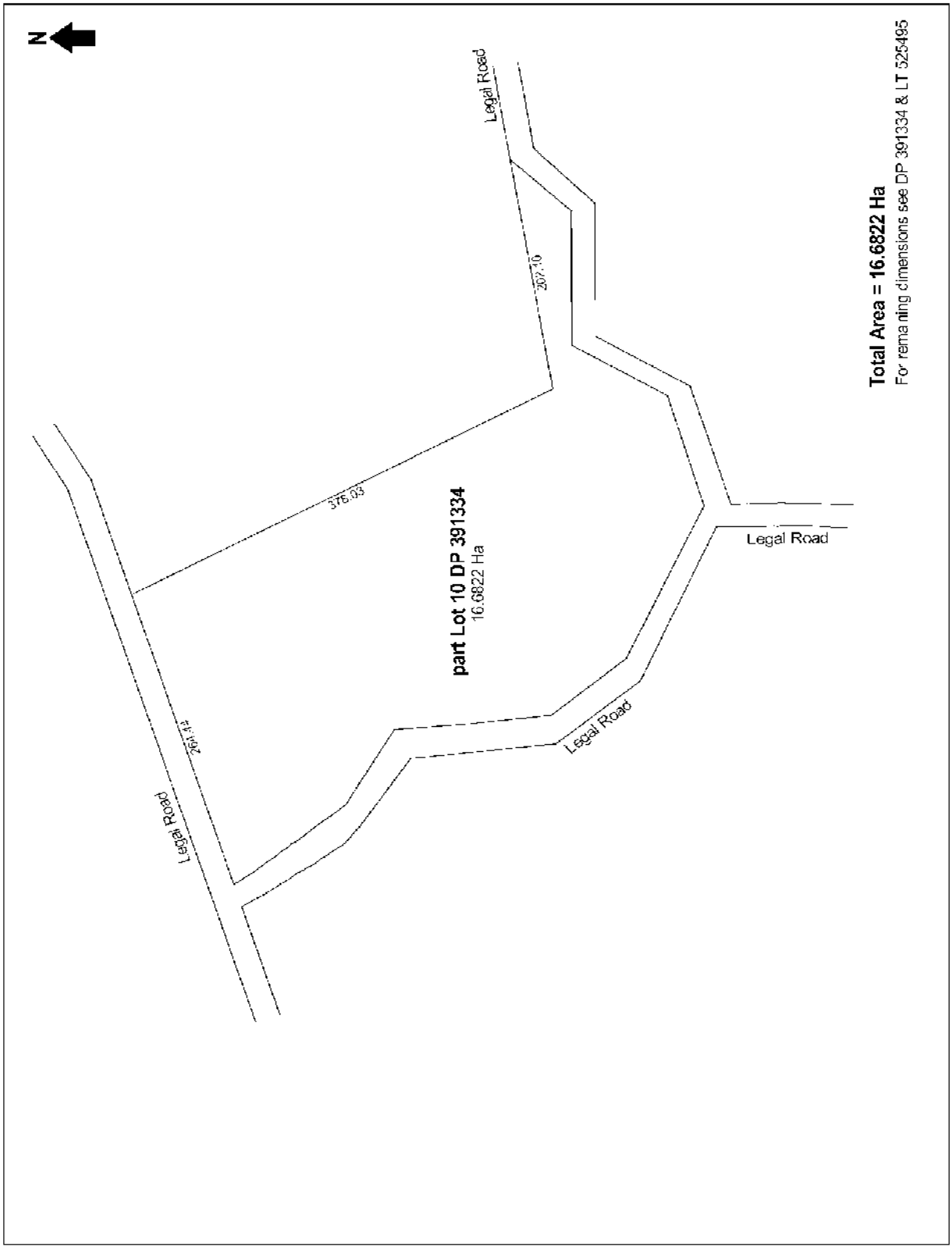
Subject to Section 241(2) Resource Management Act 1991 (affects DP 525495)

Subject to a right (in gross) to convey electricity over part Lot 4 DP 525495 marked R and part Lot 10 DP 391334 marked U all on DP 529160 in favour of Aurora Energy Limited created by Easement Instrument 11462172.5 - 14.10.2019 at 10:40 am

Subject to a right (in gross) to convey telecommunications and water over part Lot 4 DP 525495 marked S and part Lot 10 DP 391334 marked V all on DP 529160 in favour of Shine Irrigation Company Limited created by Easement Instrument 11462172.6 - 14.10.2019 at 10:40 am


Title Plan
LT 517385
Approved on: 21/12/2017
LOTS 1 TO 8 BEING A SUBDIVISION OF LOT 4 DP 459561, LOT 6 DP 392672, PTS LOT 10 DP 391334 AND PT SEC 28 SO 24641
Digitally Generated Plan
Thomson Gorge Road
Lot 1 DP 459561
Lot 2 DP 459561
Lot 3 DP 459561
Lot 2 DP 509332
Lot 2 DP 505064
Lot 1 DP 505064
Lot 3 DP 496622
Part Lot 10 DP 391334
Section 16 SO 24641
Section 18 SO 24641
Section 14 SO 24641
Section 21 SO 24641
Section 11 SO 24641
Marginal Strip G
Subject to Pt the Conservation Act 1987 (Lots 1, 3-7 and that part of Lot 2 formerly held under CFR 731592 (being Pts Lot 10 DP 391334))


NOTE:
Existing Easements Strips BA, BB, BC, BD & BF created by 5587873.8
Lot 3 DP 459561
Lot 1 DP 459561
Lot 8 DP 517385
Lot 2 DP 517385
Lot 3 DP 517385
Lot 5 DP 517385
Lot 1 DP 397672
Lot 1 DP 311382
Lot 2 DP 311382
Lot 2 DP 523873
Lot 12 DP 510514
Section 2: SO 24641
Section 7 SO 24641
Diag. A
Diag. B
Diag. C
Diag. D
Diag. E
Diag. F
Diag. G
Diag. H
Diag. I
Diag. J
Diag. K
Diag. L
Diag. M
Diag. N
Part Lot 10 DP 391334
Lot 1 DP 391334
Lot 2 DP 391334
Lot 3 DP 391334
Lot 4 DP 391334
Lot 5 DP 391334
Lot 6 DP 391334
Lot 1 DP 496622
Lot 2 DP 496622
1 70.9500Ha
2 1.4800Ha
3 3.0350Ha
4 21.4200Ha
5 13.1750Ha
6 67.6160Ha
Marginal Strip CA
Marginal Strip CB
Marginal Strip CC
Marginal Strip CD
Marginal Strip CE
Bendigo Creek
Bendigo Loop Road
Blue Mines Road
Dimensions for existing easements over Lot 1 and Lot 6 are shown on DP 391334
Subject to Part IVA Conservation Act 1987 (Affects part formerly CT 3879)
LOTS 1 - 6 BEING A SUBDIVISION OF PART LOT 10 DP 391334 AND LOT 3 DP 496622
Land District: Otago
Digitally Generated Plan
Surveyor: Elizabeth Sarah Wyatt
Firm: Paterson Pitts Partners Ltd (Dunedin)
Title Plan
LT 525495
Approved on: 24/08/2018
1 of 1


N
Legal Road
207.10
376.03
part Lot 10 DP 391334
16.6822 Ha
Legal Road
Legal Road
Legal Road
Total Area = 16.6822 Ha
For remaining dimensions see DP 391334 & LT 525495

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **841228**
Land Registration District **Otago**
Date Issued 01 November 2018

Prior References
808255

Estate	Fee Simple
Area	237.4312 hectares more or less
Legal Description	Lot 4-6 Deposited Plan 525495 and Part Lot 10 Deposited Plan 391334 and Lot 5 Deposited Plan 517385

Registered Owners
Bendigo Station Limited

Interests

Subject to Section 11 Crown Minerals Act 1991 (affects part Lot 10 DP 391334, Lot 5 DP 517385, Lot 5 DP 525495 and part Lots 4 and 6 DP 525495 formerly Section 6 and 8 SO 24641)

Subject to Part IVA Conservation Act 1987 (affects part Lot 10 DP 391334, Lot 5 DP 517385, Lot 5 DP 525495 and part Lots 4 and 6 DP 525495 formerly Section 6 and 8 SO 24641)

Irrigation Agreement under the Public Works Amendment Act 1910 (affects part Lot 10 DP 391334, Lot 5 DP 517385, Lot 5 DP 525495 and part Lots 4 and 6 DP 525495 formerly Section 6 and 8 SO 24641)

5009824.9 Conservation Covenant pursuant to Section 77 Reserves Act 1977 - 2.10.2000 at 2:44 pm (affects part Lot 10 DP 391334, Lot 5 DP 517385 and part Lots 4 and 6 DP 525495 formerly Section 6 and 8 SO 24641)

Appurtenant to part Lot 4 DP 525495 formerly Lot 3 DP 311382 is a right to pump and convey water, right to occupy bore and a right to convey electricity created by Transfer 5292258.1 - 23.7.2002 at 9:20 am

5587873.8 Esplanade Strip Instrument pursuant to Section 232 Resource Management Act 1991 - 15.5.2003 at 9:00 am (affects part Lot 4 DP 525495 formerly Lot 3 DP 311382)

7780662.6 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 11.4.2008 at 9:00 am

Subject to a right of way (in gross) over part Lot 6 DP 525495 marked DB, U and AD on DP 525495 and a right of way (pedestrian access only) over part Lot 6 DP 525495 marked DB on DP 525495 in favour of Her Majesty the Queen created by Easement Instrument 7780662.9 - 11.4.2008 at 9:00 am

The easements created by Easement Instrument 7780662.9 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right of way over part Lot 6 DP 525495 marked V, U, AD and DB on DP 525495 created by Easement Instrument 7780662.10 - 11.4.2008 at 9:00 am

The easements created by Easement Instrument 7780662.10 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right (in gross) to convey water over part Lot 6 DP 525495 marked M, O & V on DP 525495 in favour of Schoolhouse Terrace Service Company Limited created by Easement Instrument 7780662.11 - 11.4.2008 at 9:00 am

Land Covenant in Easement Instrument 7780662.13 - 11.4.2008 at 9:00 am

Appurtenant hereto is a right to convey electricity created by Easement Instrument 10539860.7 - 8.9.2016 at 9:26

Identifier **841228**

am

10591681.12 Mortgage to Bank of New Zealand - 3.11.2016 at 2:33 pm

11260401.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 1.11.2018 at 1:43 pm (affects Lot 4-6 DP 525495)

Subject to Section 241(2) Resource Management Act 1991 (affects DP 525495)

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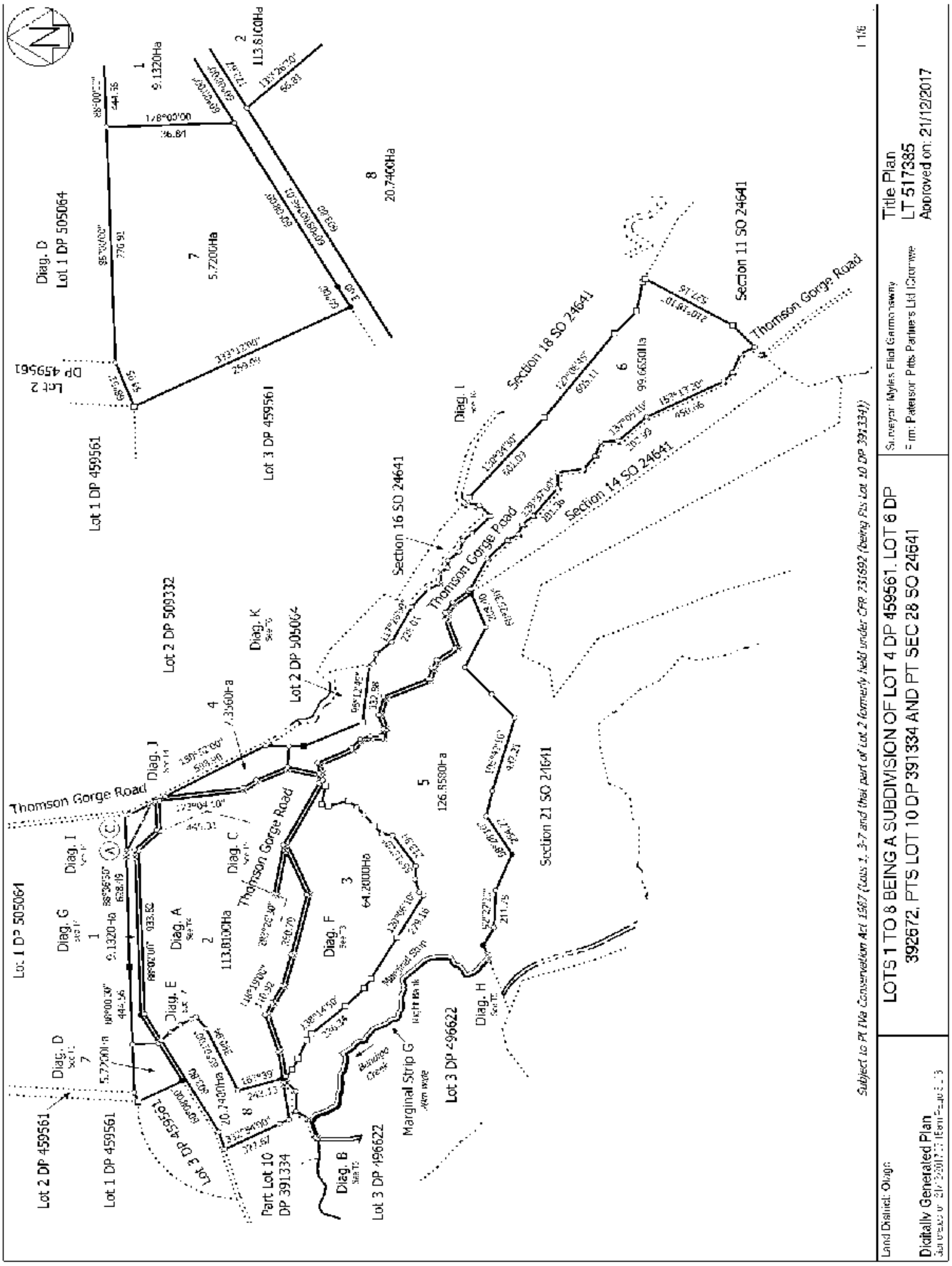
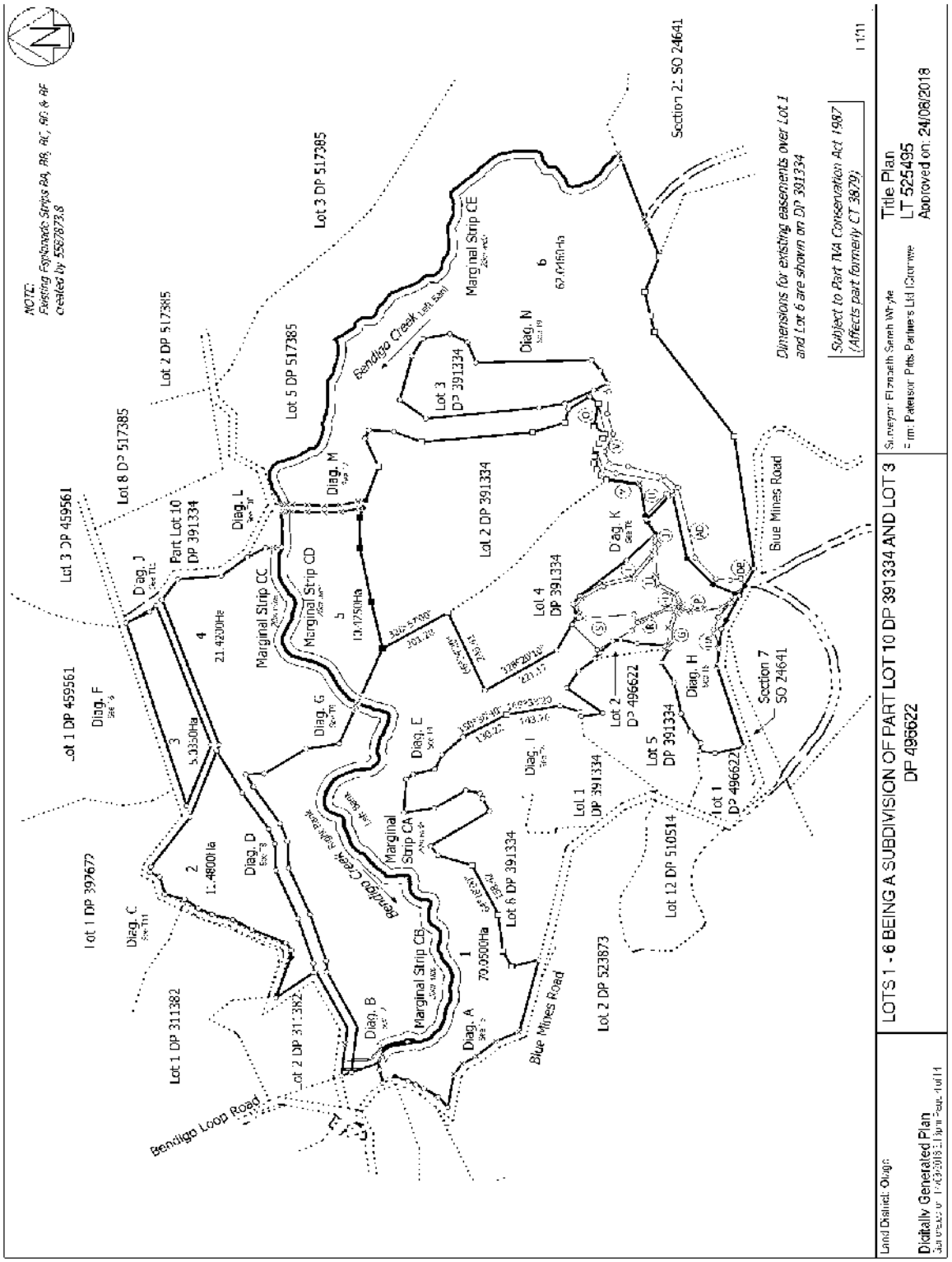
Subject to a right (in gross) to convey telecommunications and water over part Lot 4 DP 525495 marked S and part Lot 10 DP 391334 marked V all on DP 529160 in favour of Shine Irrigation Company Limited created by Easement Instrument 11462172.6 - 14.10.2019 at 10:40 am



Title Plan
LT 517385
Approved on: 21/12/2017
LOTS 1 TO 8 BEING A SUBDIVISION OF LOT 4 DP 459561, LOT 6 DP 392672, PTS LOT 10 DP 391334 AND PT SEC 28 SO 24641
Land District: Otago
Digitally Generated Plan
Firm: Paterson Pitts Partners Ltd (Cromwell)
Thomson Gorge Road
Section 18 SO 24641
Section 11 SO 24641
Section 14 SO 24641
Section 16 SO 24641
Section 21 SO 24641
Lot 1 DP 505064
Lot 2 DP 505064
Lot 2 DP 509332
Lot 1 DP 459561
Lot 2 DP 459561
Lot 3 DP 459561
Lot 3 DP 496622
Part Lot 10 DP 391334
Marginal Strip G
Diag. D
Diag. A
Diag. B
Diag. C
Diag. E
Diag. F
Diag. G
Diag. H
Diag. I
Diag. J
Diag. K
1 9.1320Ha
2 113.8100Ha
3 64.2000Ha
4 7.3560Ha
5 126.8580Ha
6 99.6650Ha
7 5.7200Ha
8 20.7400Ha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Lot 1 DP 459561
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Lot 2 DP 517385
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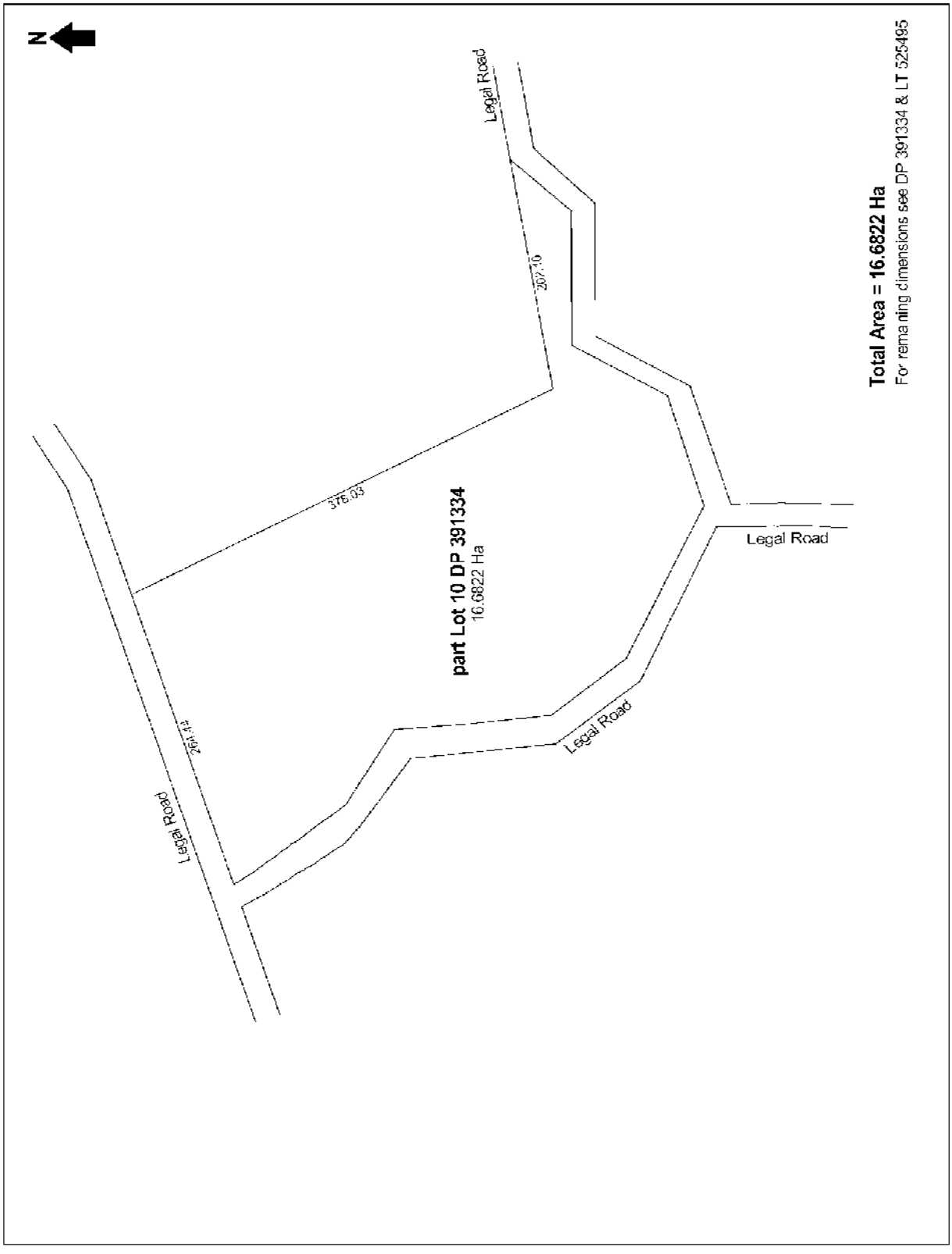
Lot 1 DP 397672
Lot 1 DP 311382
Lot 2 DP 311382
Lot 2 DP 523873
Lot 12 DP 510514
Section 2: SO 24641
Section 7 SO 24641
Diag. A
Diag. B
Diag. C
Diag. D
Diag. E
Diag. F
Diag. G
Diag. H
Diag. I
Diag. J
Diag. K
Diag. L
Diag. M
Diag. N
Part Lot 10 DP 391334
Lot 1 DP 391334
Lot 2 DP 391334
Lot 3 DP 391334
Lot 4 DP 391334
Lot 5 DP 391334
Lot 6 DP 391334
Lot 1 DP 496622
Lot 2 DP 496622
1 70.9500Ha
2 1.4800Ha
3 3.0350Ha
4 21.4200Ha
5 13.1750Ha
6 67.6160Ha
Marginal Strip CA
Marginal Strip CB
Marginal Strip CC
Marginal Strip CD
Marginal Strip CE
Bendigo Creek
Bendigo Loop Road
Blue Mines Road
Dimensions for existing easements over Lot 1 and Lot 6 are shown on DP 391334
Subject to Part IVA Conservation Act 1987 (Affects part formerly CT 3879)
LOTS 1 - 6 BEING A SUBDIVISION OF PART LOT 10 DP 391334 AND LOT 3 DP 496622
Land District: Otago
Digitally Generated Plan
Surveyor: Elizabeth Sarah Wyatt
Firm: Paterson Pitts Partners Ltd (Dunedin)
Title Plan
LT 525495
Approved on: 24/08/2018
1 of 1


N
Legal Road
207.10
376.03
part Lot 10 DP 391334
16.6822 Ha
Legal Road
Legal Road
Legal Road
Total Area = 16.6822 Ha
For remaining dimensions see DP 391334 & LT 525495

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **201479**
Land Registration District **Otago**
Date Issued 14 February 2005

Prior References
4482 GN936126.2

Estate	Fee Simple
Area	458.0470 hectares more or less
Legal Description	Section 10, 21, 25-26, 31 Survey Office Plan 24641 and Section 32 Block III Wakefield Survey District
Purpose	Historic Reserve

Registered Owners
Her Majesty the Queen

Interests

Sunject to the Reserves Act 1977

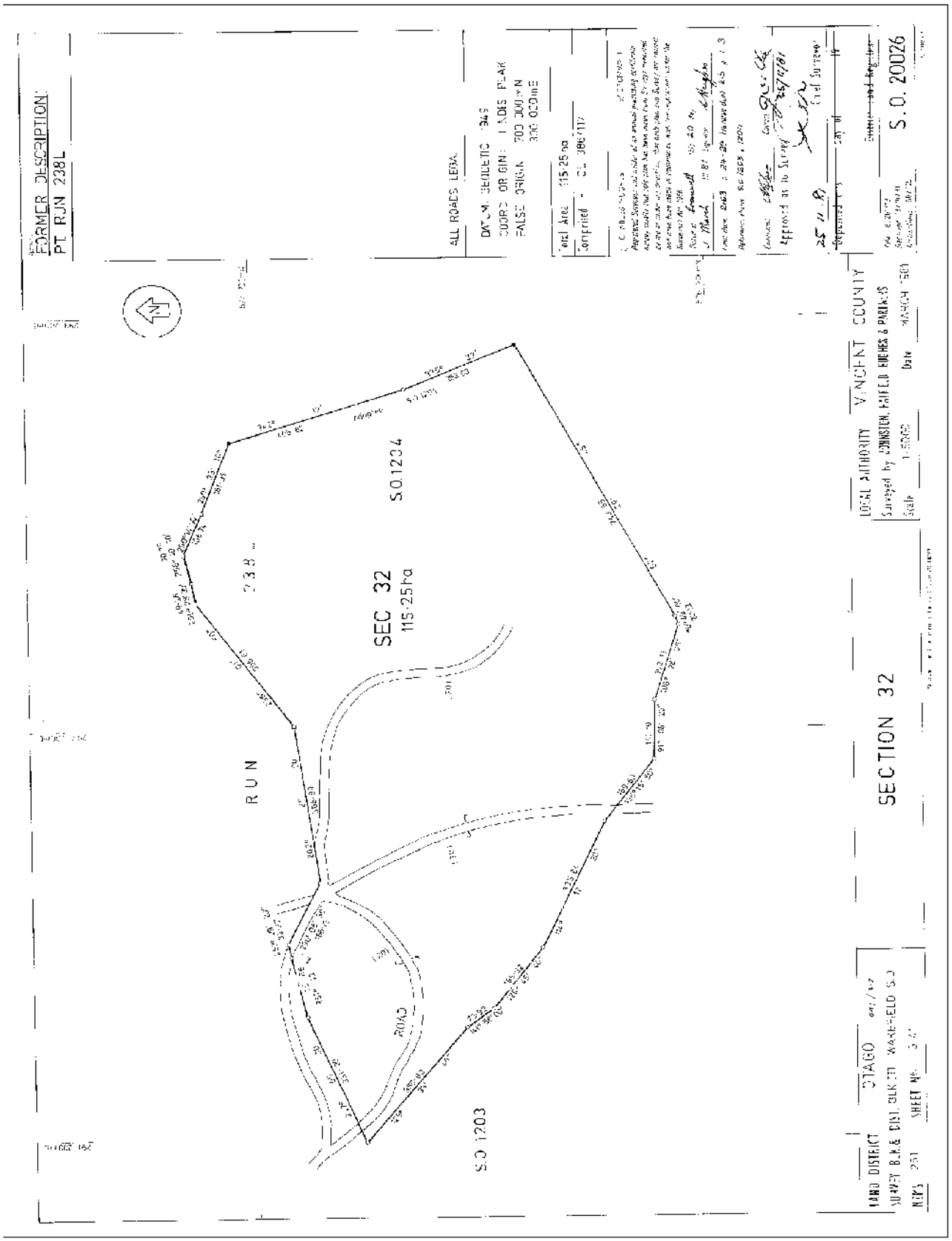
6359627.1 SUBJECT TO PART 9 OF THE NGAI TAHU CLAIMS SETTLEMENT ACT 1998 (WHICH PROVIDES FOR CERTAIN DISPOSALS RELATING TO THE LAND TO WHICH THIS CERTIFICATE OF TITLE RELATES TO BE OFFERED FOR PURCHASE OR LEASE TO TE RUNANGA O NGAI TAHU IN CERTAIN CIRCUMSTANCES) - 30.3.2005 at 9:00 am

Appurtenant hereto is a right of way created by Easement Instrument 6526947.3 - 9.8.2005 at 9:00 am

Subject to a right of way over part Section 32 marked E SO 24641 created by Easement Instrument 6526947.6 - 9.8.2005 at 9:00 am

Subject to a right of way over part Section 21 SO 24641 marked F SO 24641 created by Easement Instrument 6526947.7 - 9.8.2005 at 9:00 am

Identifier **201479**



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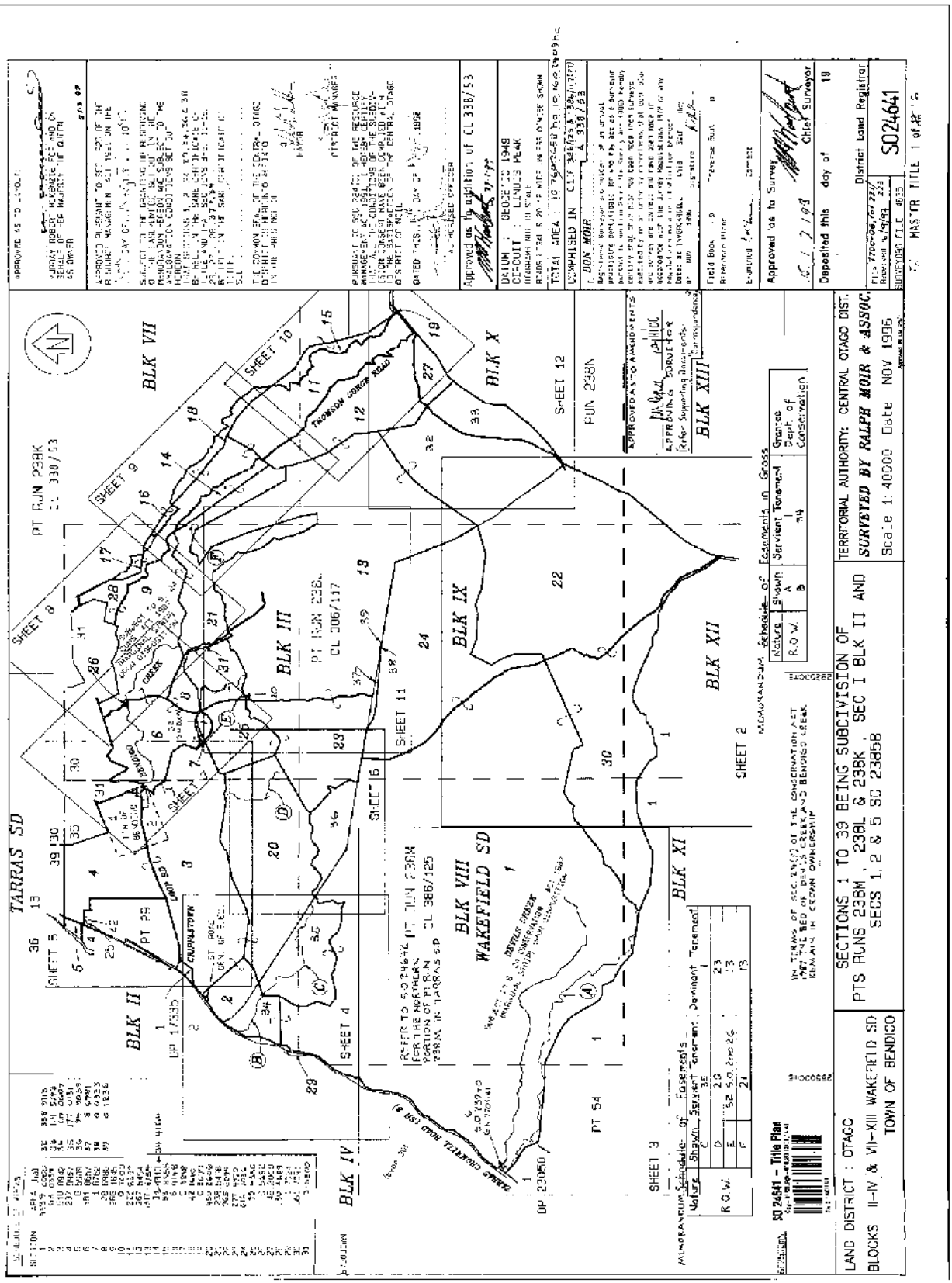

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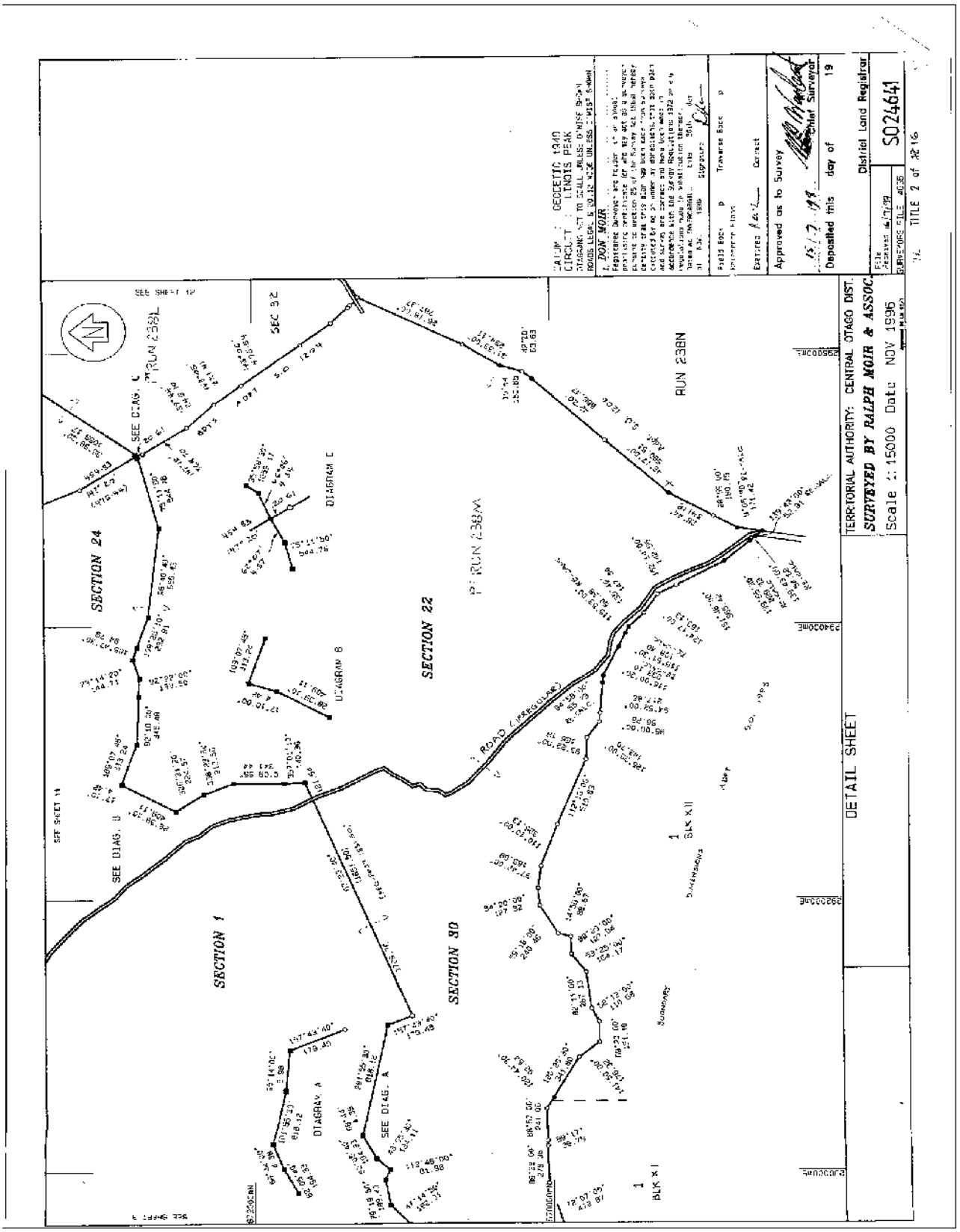
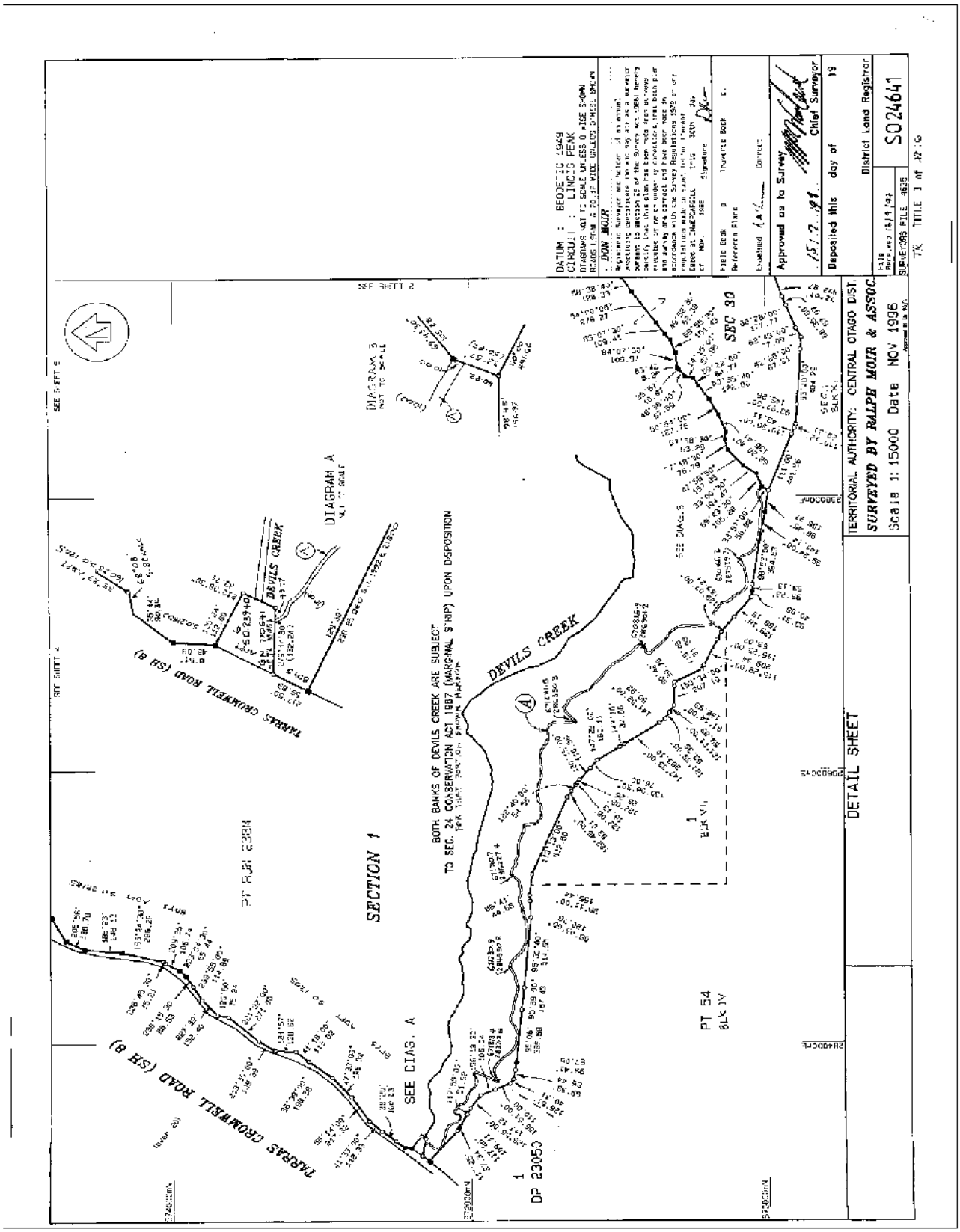
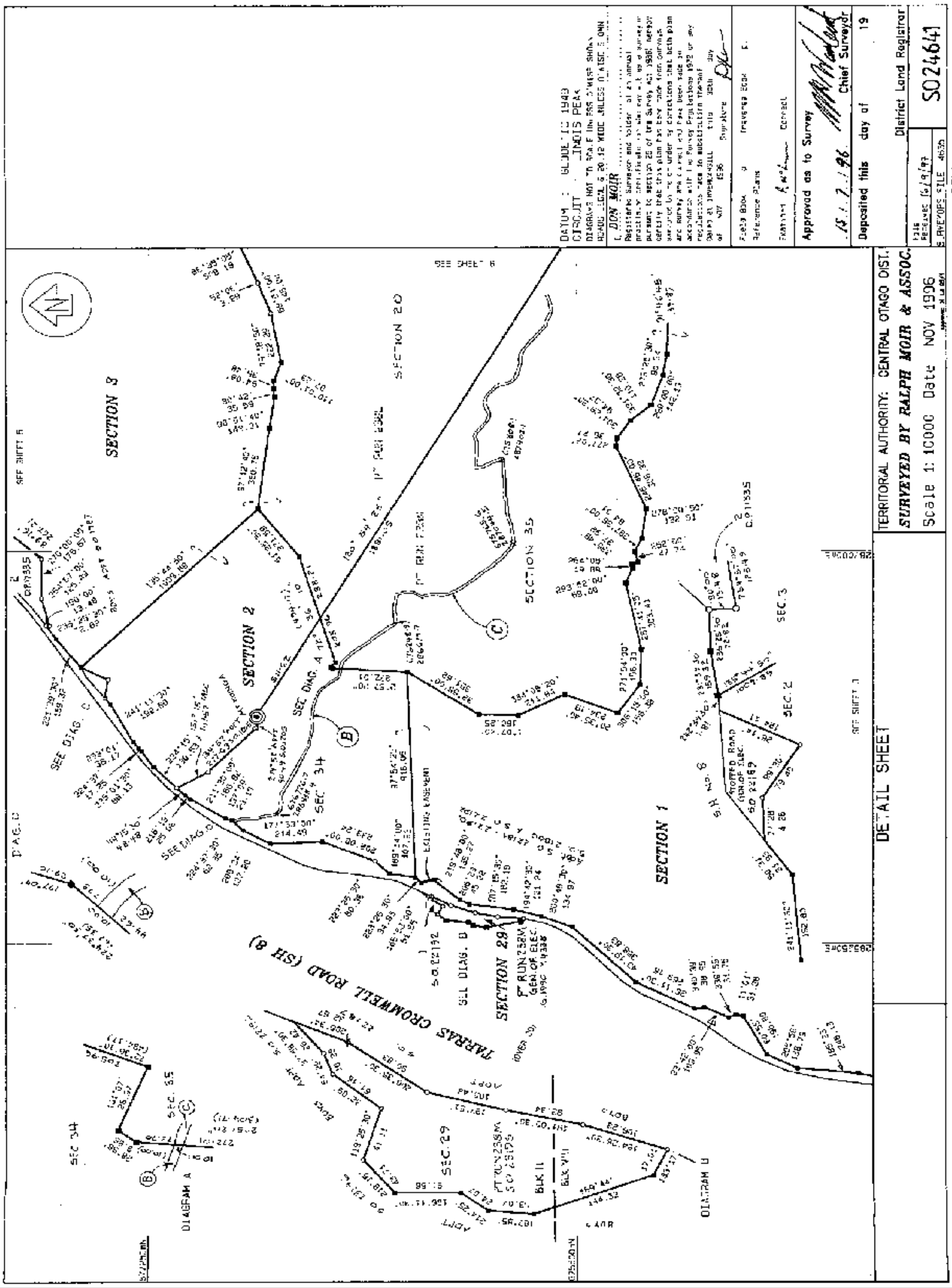
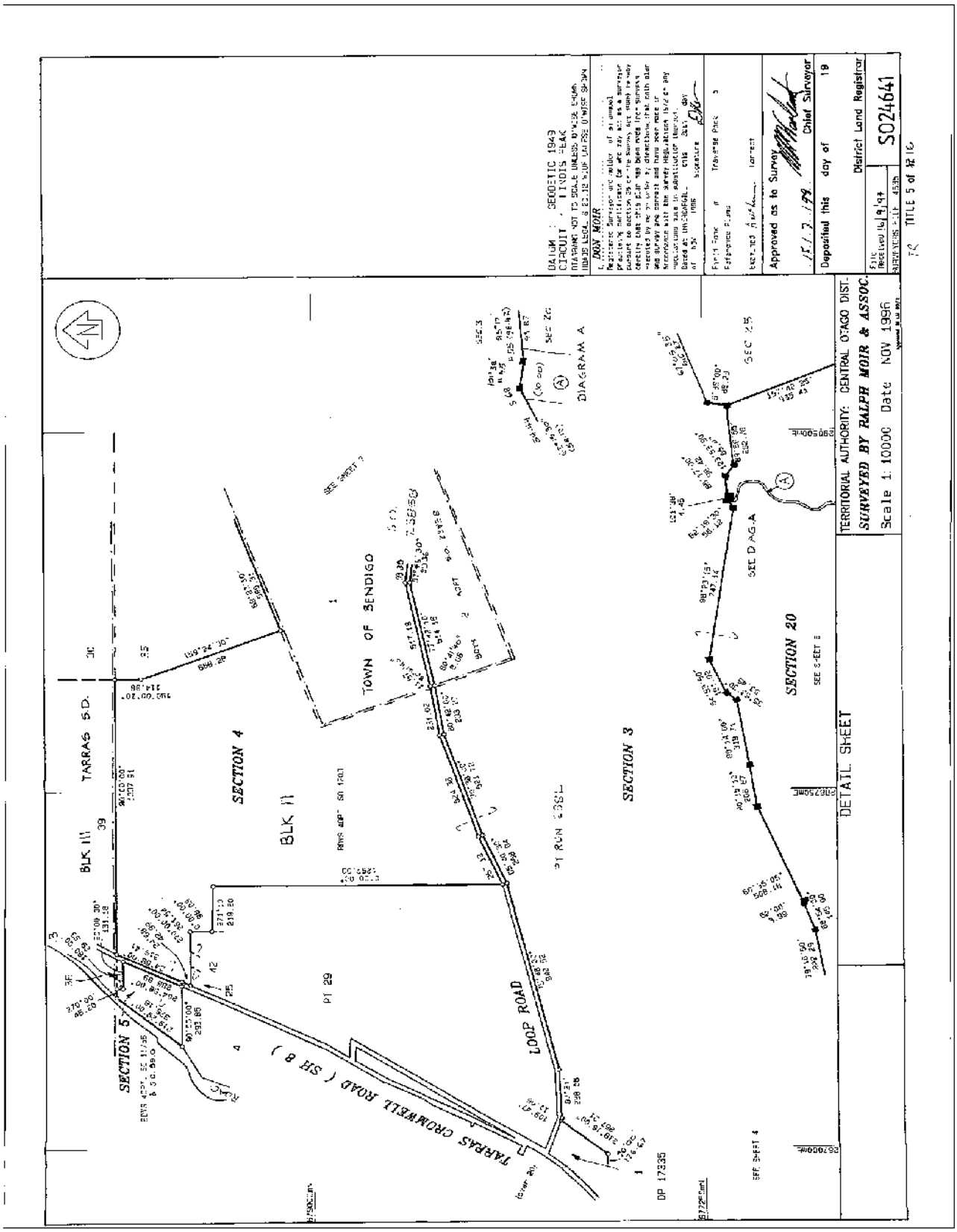
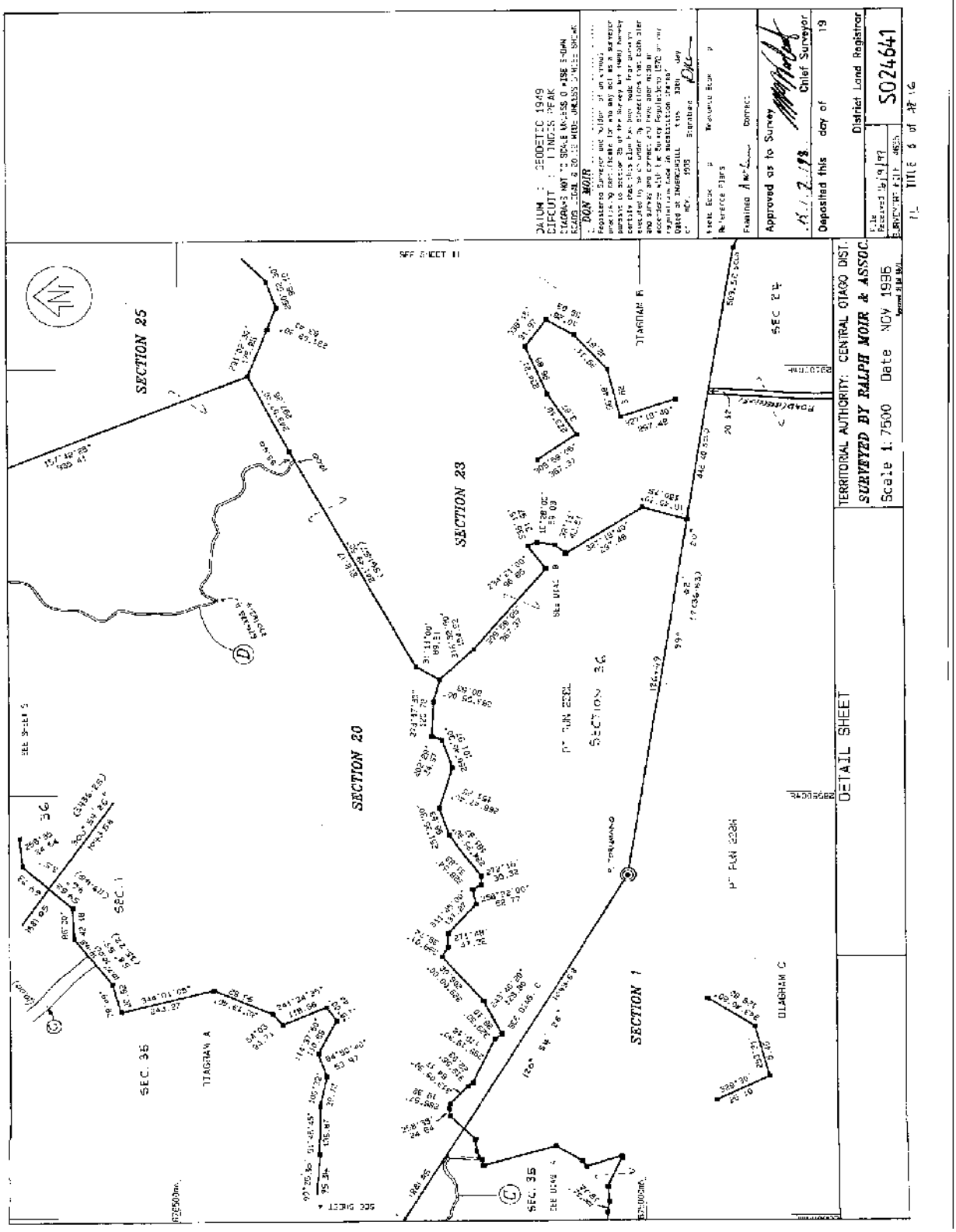



DETAIL SHEET
SURVEYED BY RALPH MOIR & ASSOC.
TERRITORIAL AUTHORITY: CENTRAL OTAGO DIST.
Scale 1: 15000 Date NOV 1996
District Land Registrar
S024641
SECTION 1
DEVILS CREEK
TARRAS CROMWELL ROAD (SH 8)
SEE DIAG. A
DIAGRAM A
DIAGRAM B
SEC 30
PT 54
BLK IV
1 DP 23050
BOTH BANKS OF DEVILS CREEK ARE SUBJECT TO SEC. 24 CONSERVATION ACT 1987 (MARGINAL STRIP) UPON DISPOSITION

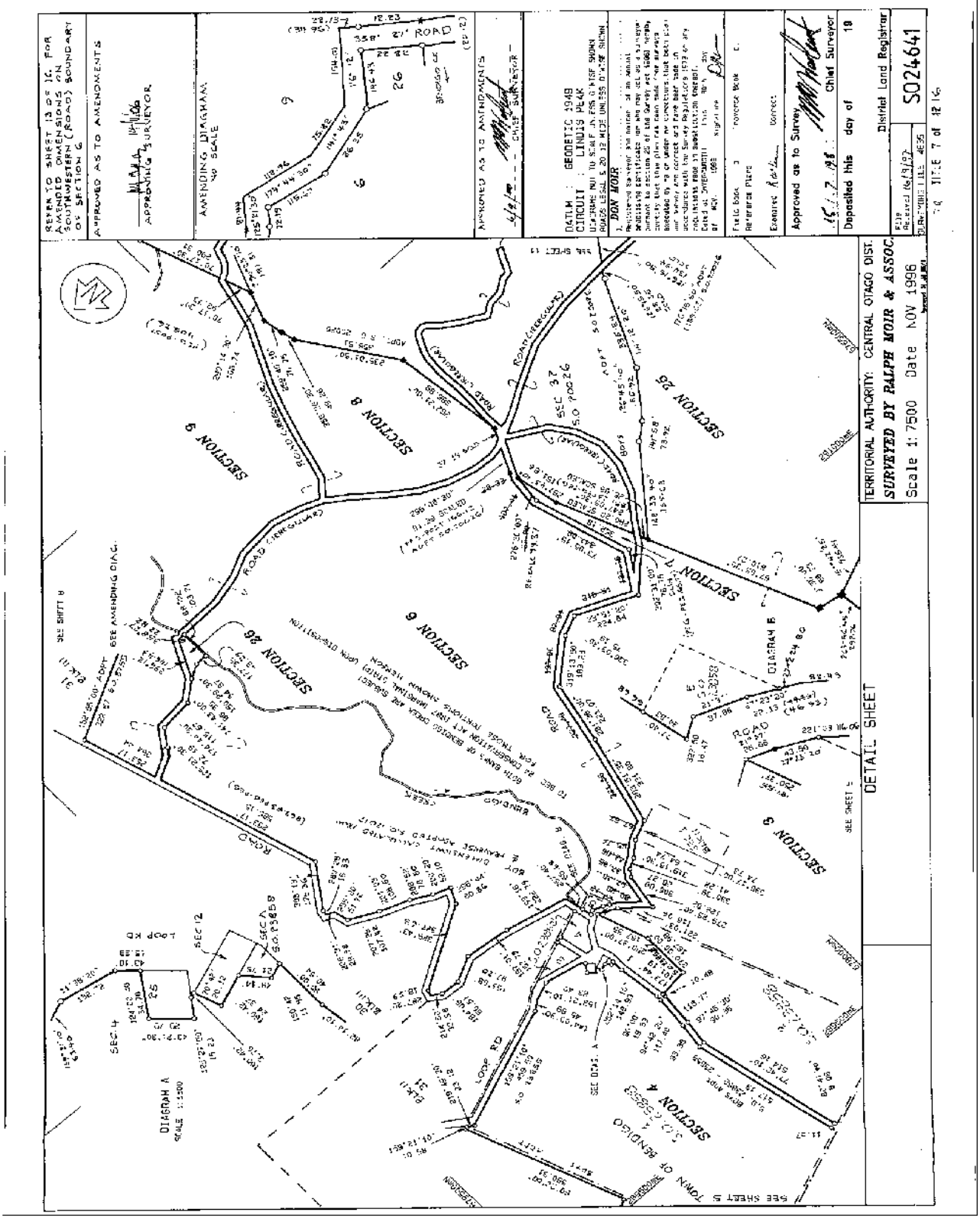

DETAIL SHEET
TERRITORIAL AUTHORITY: CENTRAL OTAGO DIST.
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:10000 Date NOV 1996
SO 24641
District Land Registrar
Chief Surveyor
Approved as to Survey
Deposited this day of 19
SECTION 1
SECTION 2
SECTION 3
SECTION 29
TARRAS CROMWELL ROAD (SH 8)
DIAGRAM A
DIAGRAM B

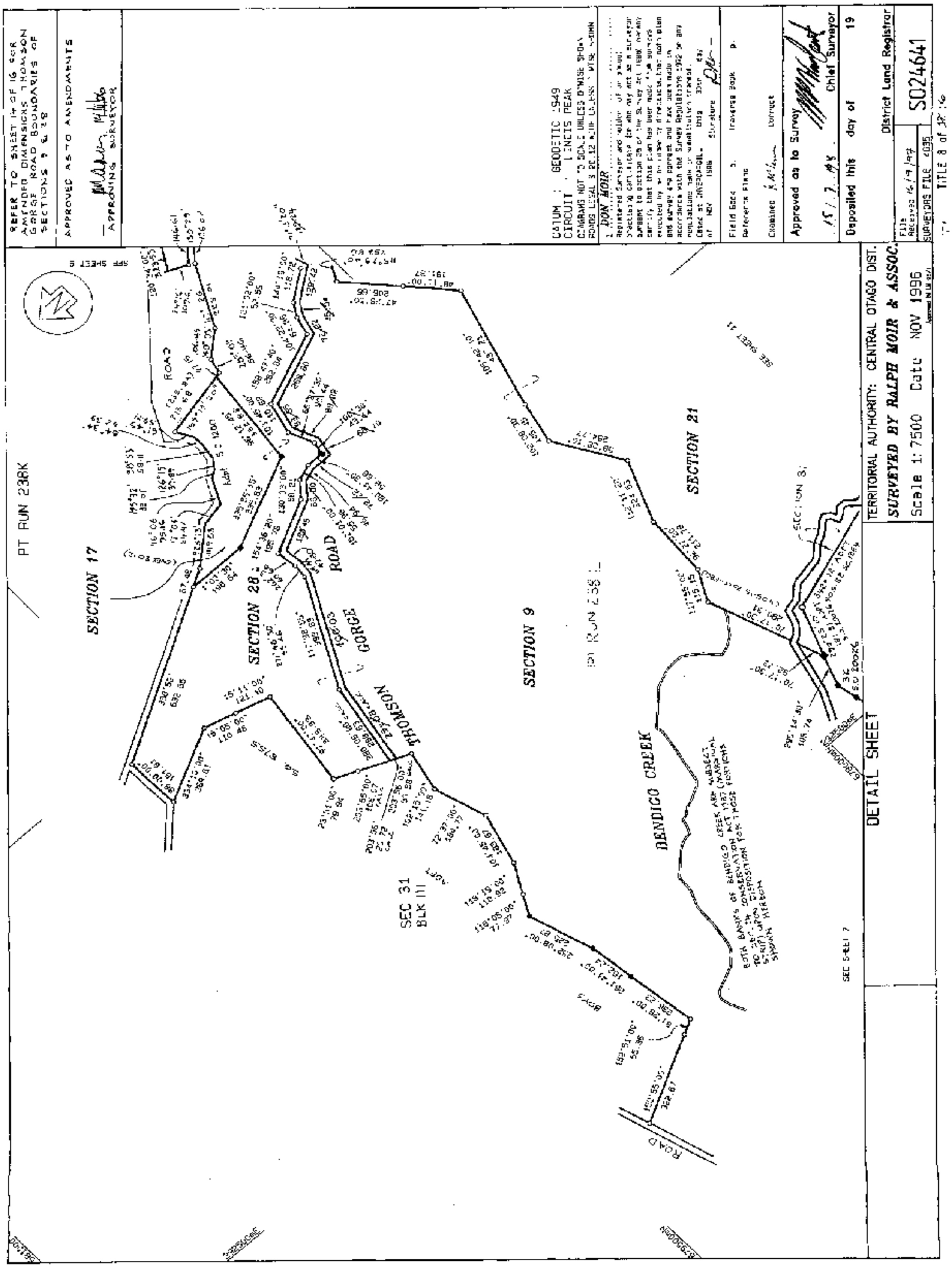

DATUM : GEODETIC 1949
CIRCUIT : TINDIS - LEAK
DON MOIR
Approved as to Survey
Chief Surveyor
Deposited this day of 19
District Land Registrar
SO24641
TERRITORIAL AUTHORITY: CENTRAL OTAGO DIST.
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1: 10000 Date NOV 1996
DETAIL SHEET
TITLE 5 of 12
TOWN OF SENDIGO
SECTION 4
SECTION 3
SECTION 20
SECTION 5
BLK II
BLK III
TARRAS SD.
PT 29
DP 17335
LOOP ROAD
TARRAS CROMWELL ROAD (SH 8)
DIAGRAM A
SEE SHEET 2
SEE SHEET 3
SEE SHEET 4
SEE DIAG A

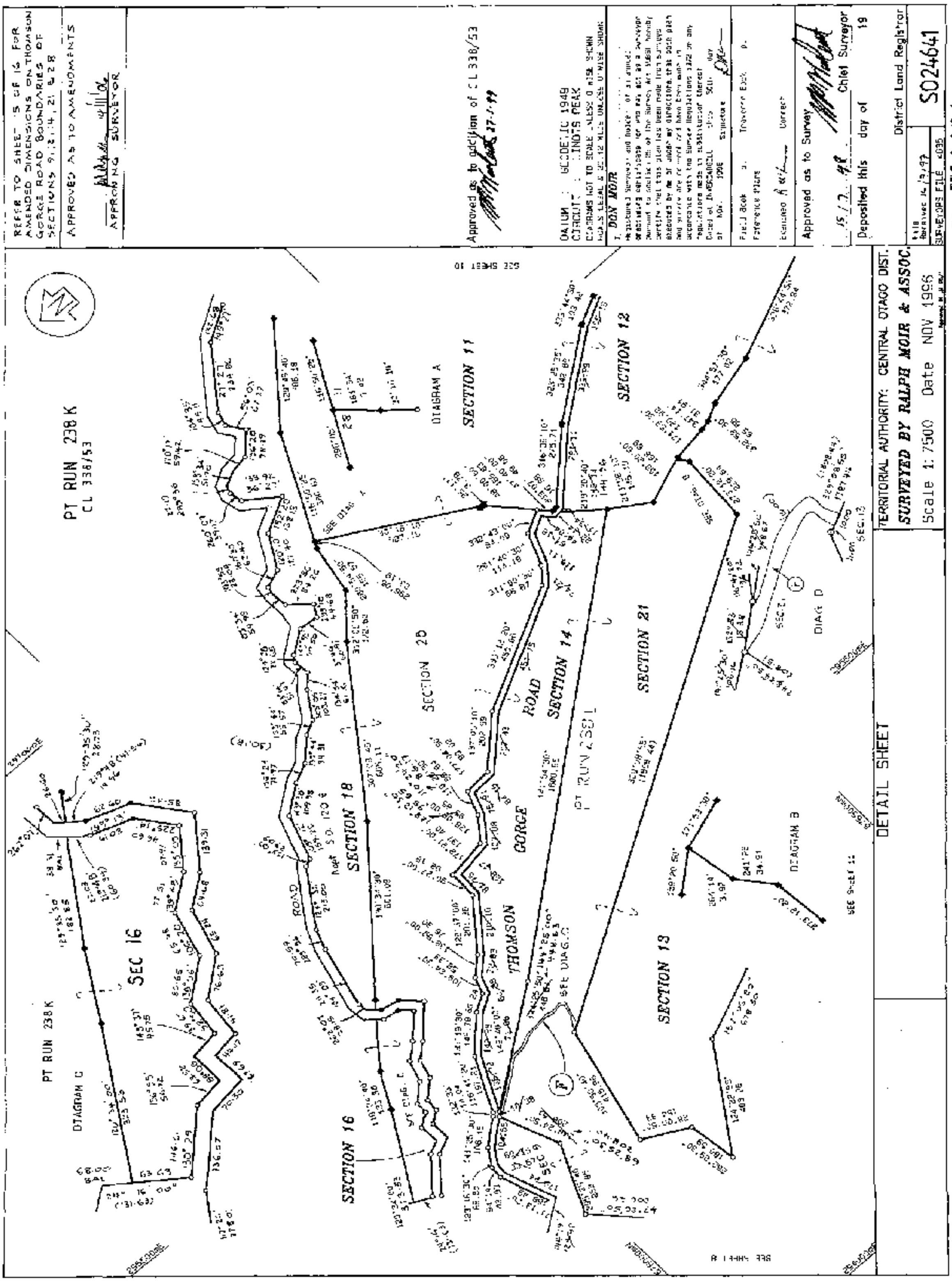
Identifier **201479**

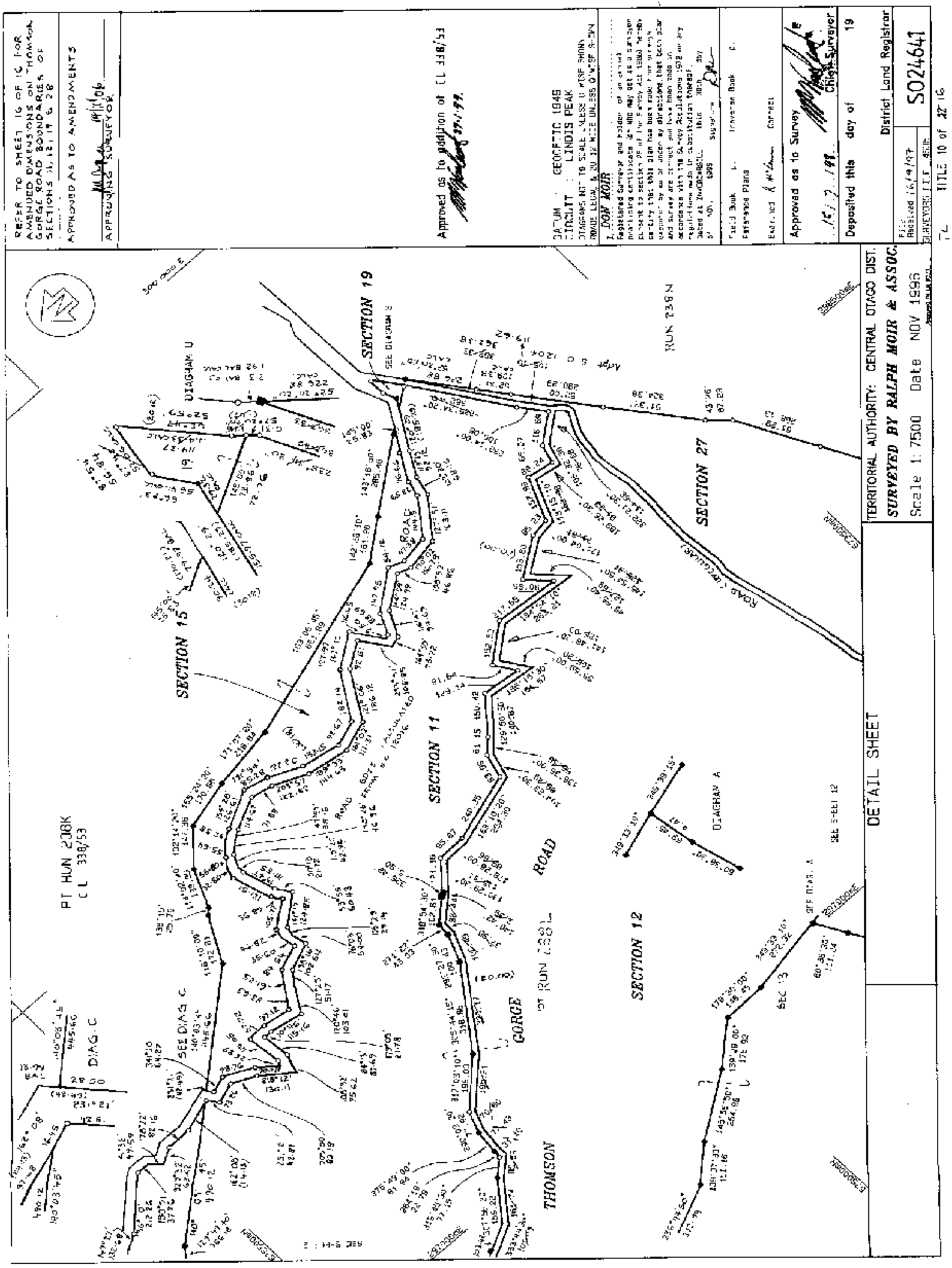


Identifier **201479**

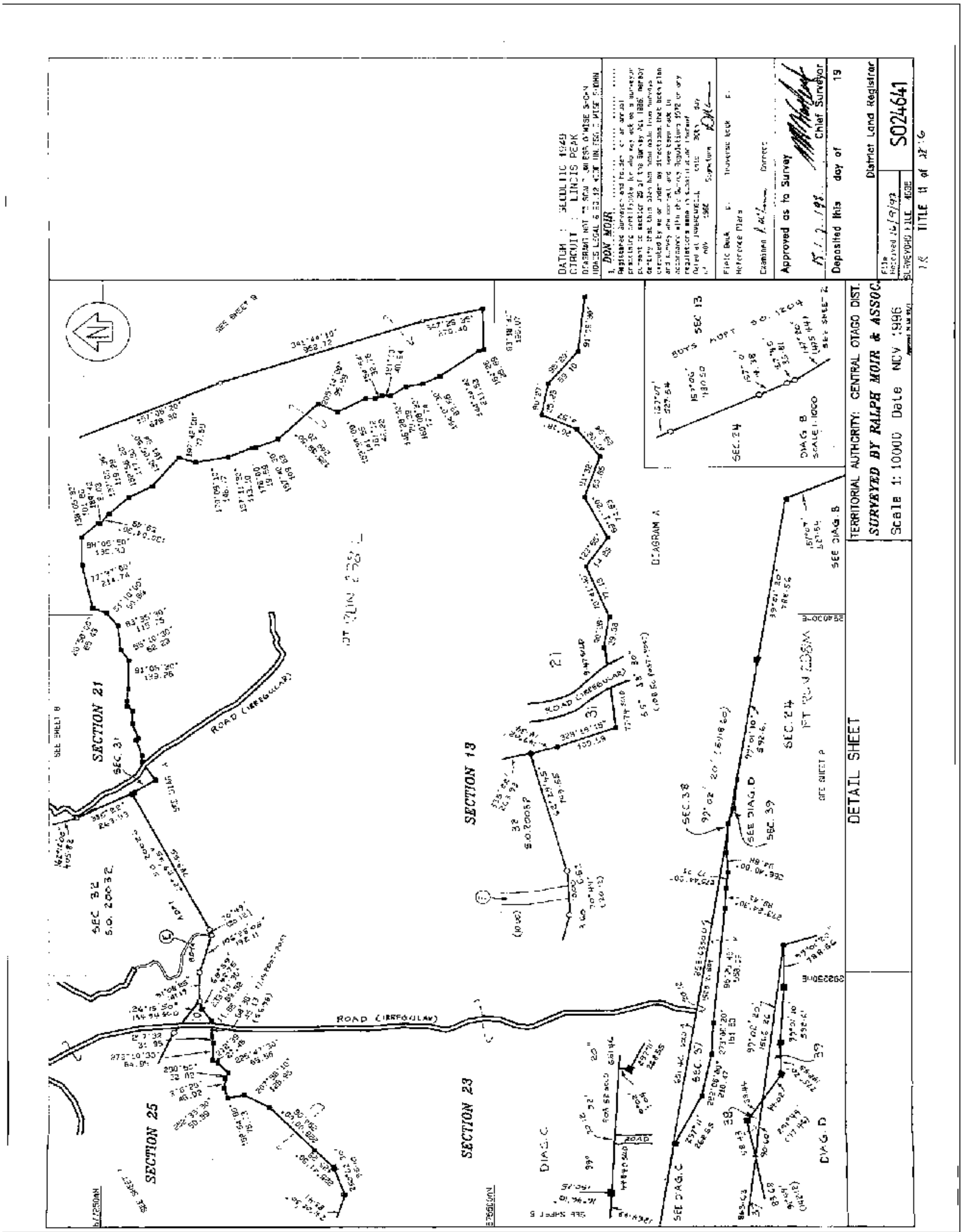


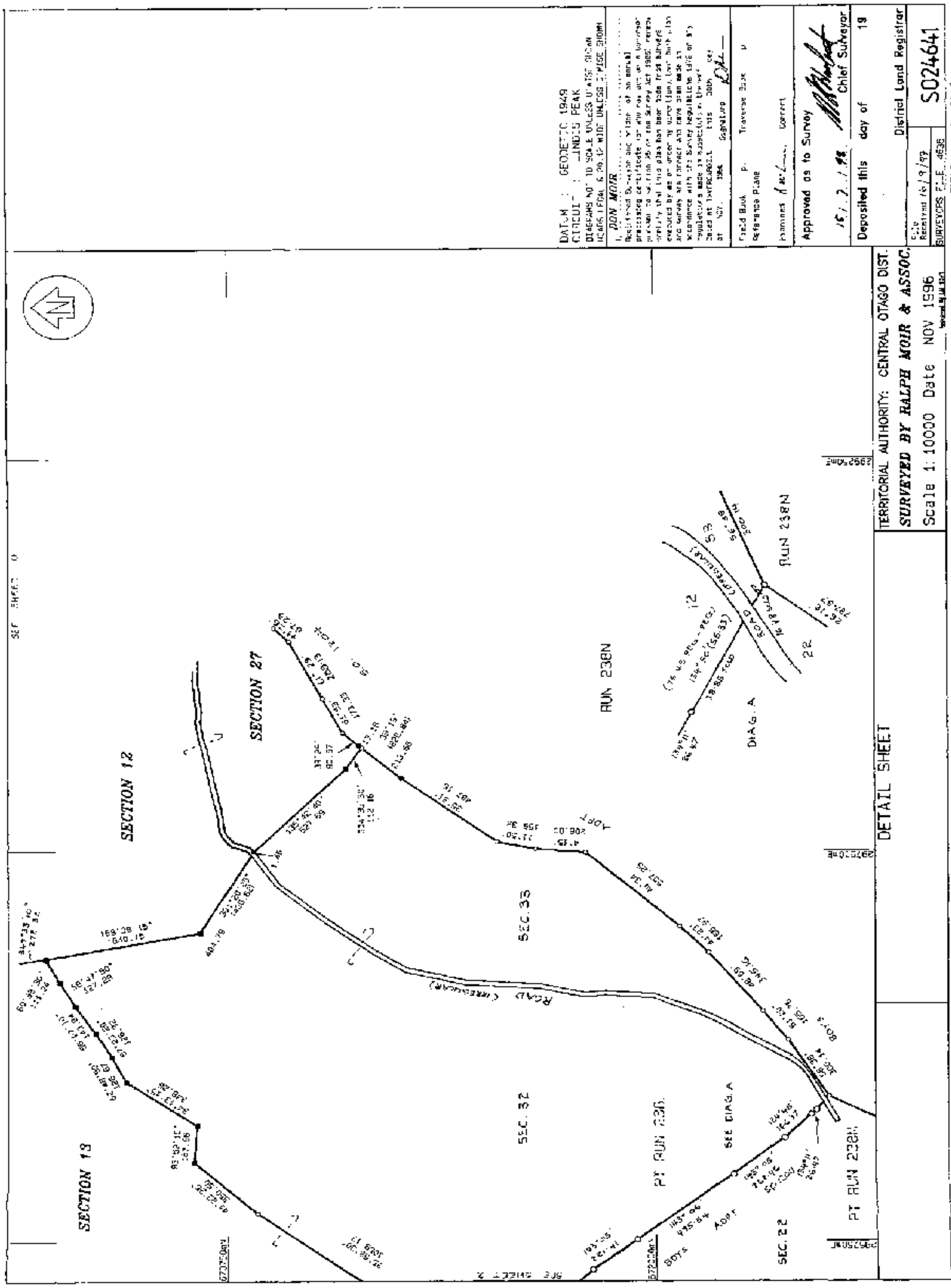

SECTION 17
SECTION 28
SECTION 9
SECTION 21
PT RUN 238K
SEC 31
BLK III
THOMSON GORGE ROAD
BENDIGO CREEK
DETAIL SHEET
TERRITORIAL AUTHORITY: CENTRAL OTAGO DIST.
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:7500 Date NOV 1996
DATUM : GEODETIC 1949
CIRCUIT : LINDIS PEAK
APPROVED AS TO AMENDMENTS
APPROVING SURVEYOR
Approved as to Survey
Chief Surveyor
Deposited this day of 19
District Land Registrar
SO24641

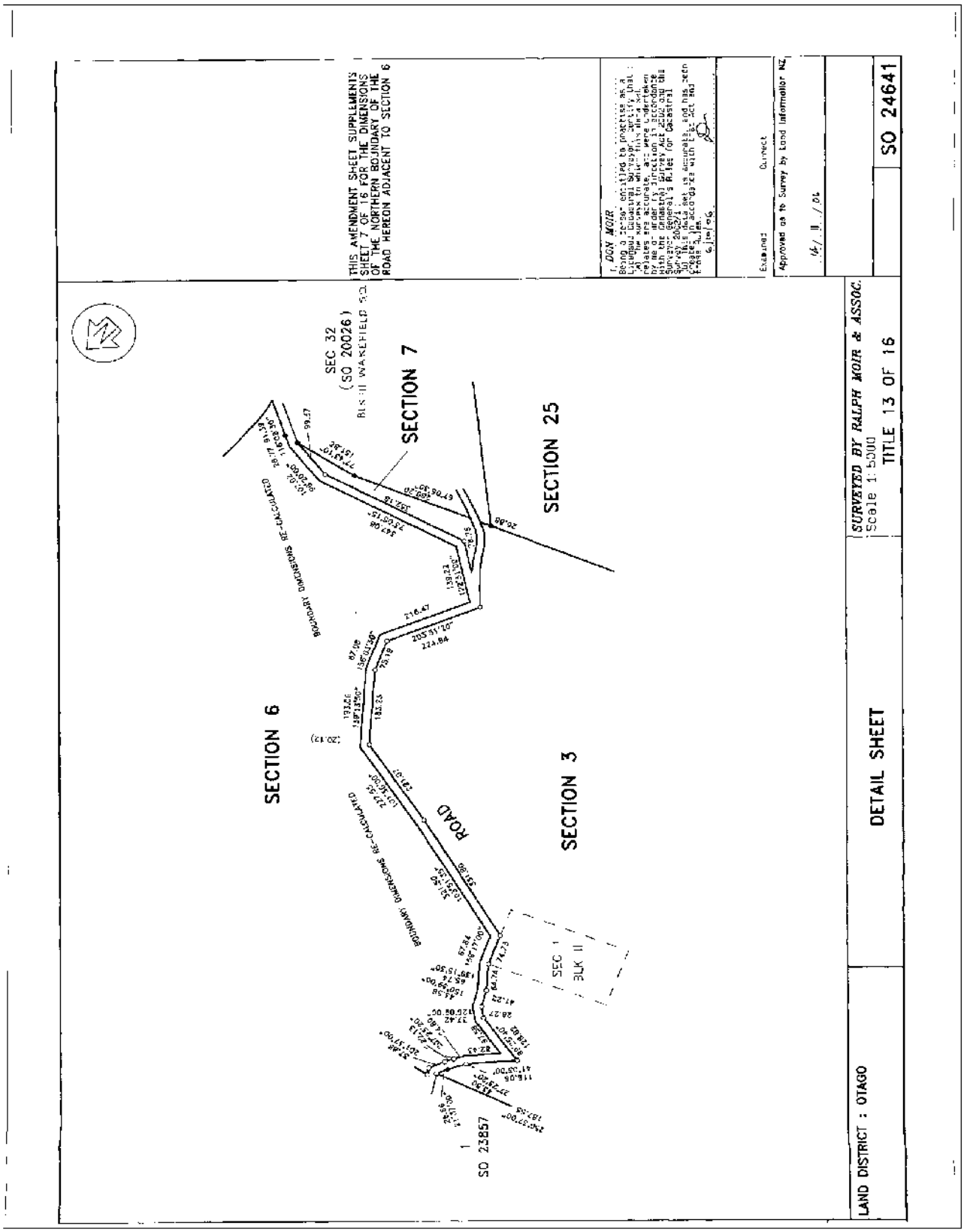

DETAIL SHEET
PT RUN 238 K
CL 338/53
SECTION 11
SECTION 12
SECTION 21
SECTION 13
SECTION 14
SECTION 18
SECTION 16
SECTION 25
SEC 16
THOMSON GORGE ROAD
DIAGRAM A
DIAGRAM B
DIAGRAM C
TERRITORIAL AUTHORITY: CENTRAL OTAGO DIST.
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:7500 Date NOV 1996
Approved as to Survey
Deposited this day of
District Land Registrar
Chief Surveyor
SO24641

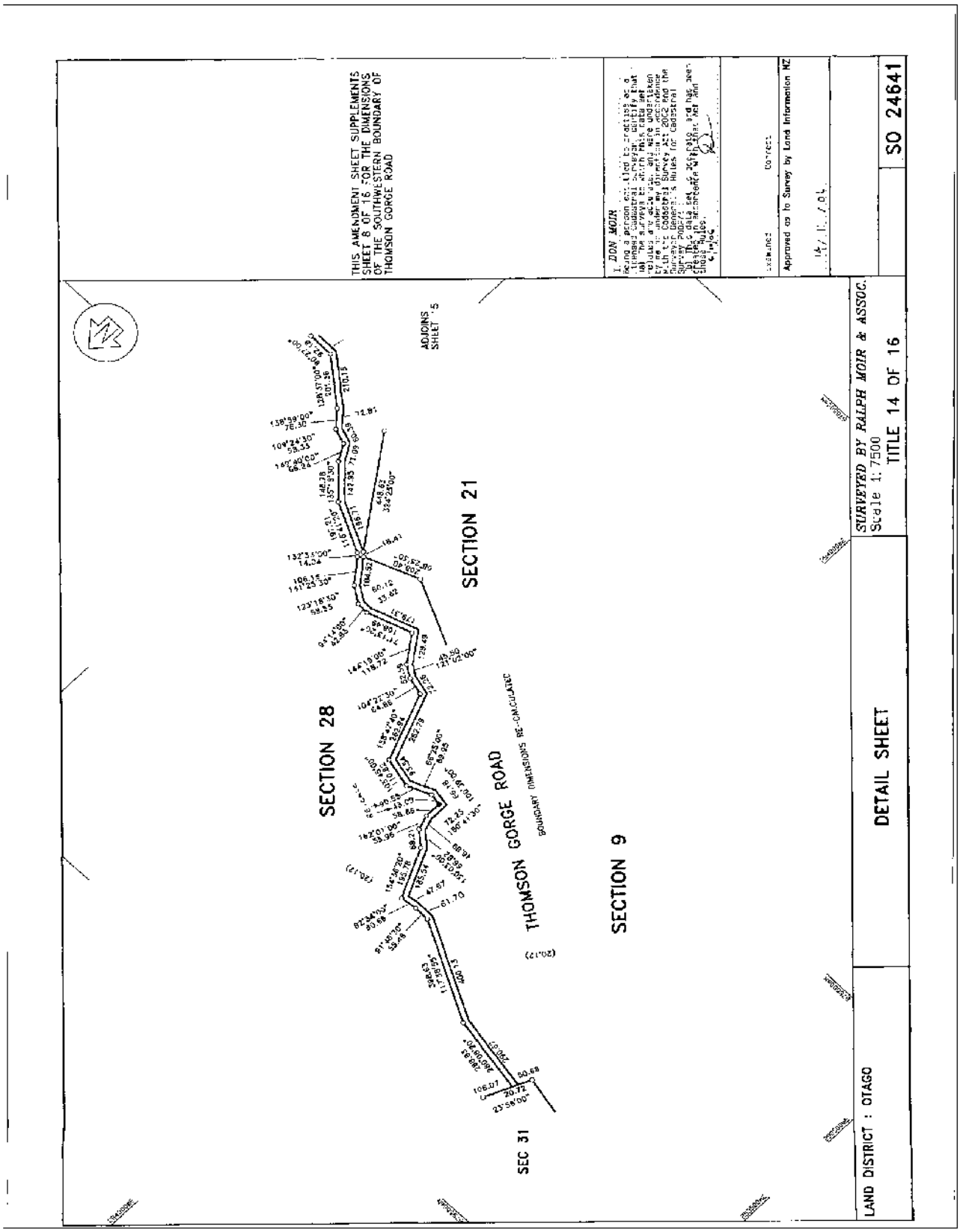


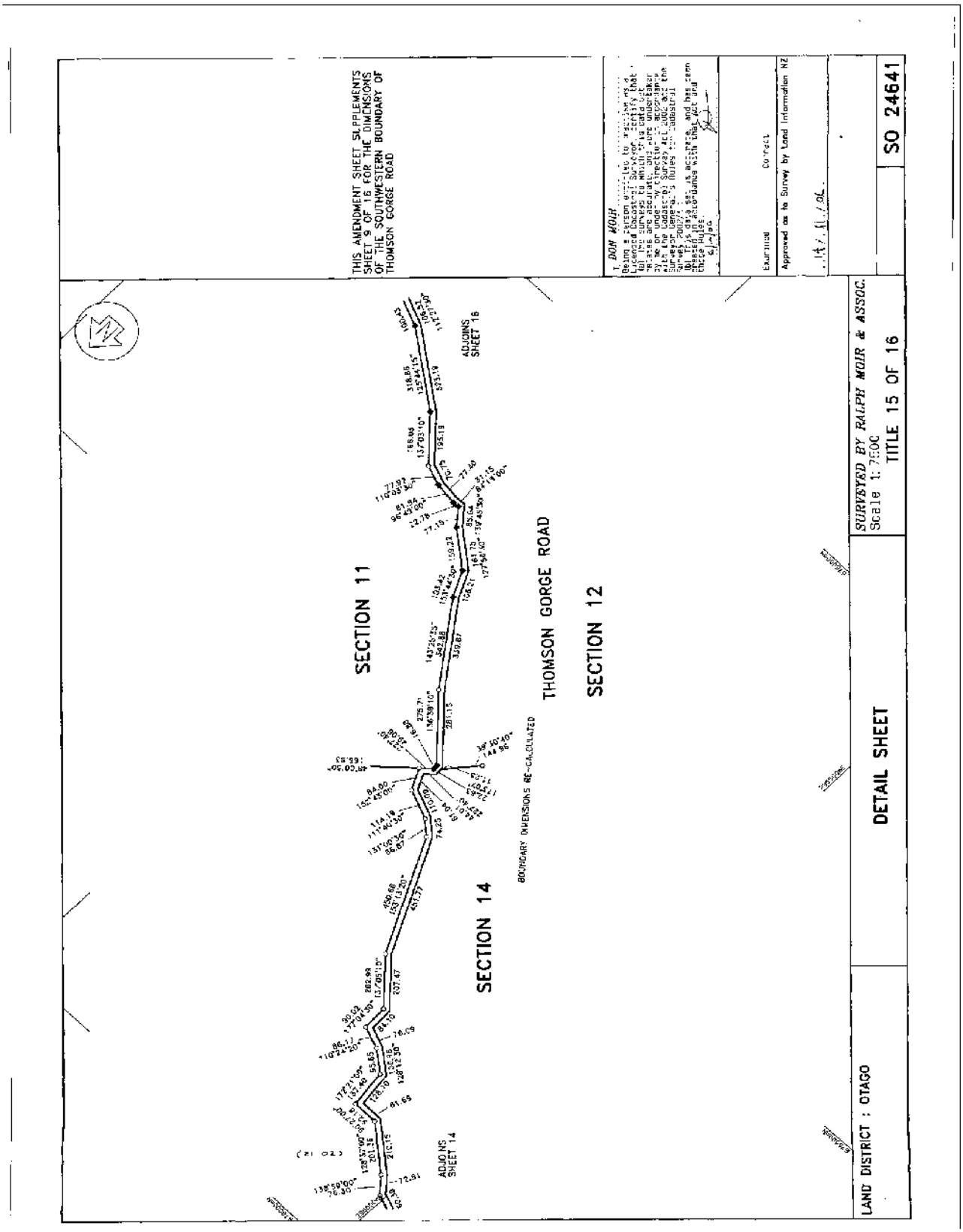
DETAIL SHEET
TERRITORIAL AUTHORITY: CENTRAL OTAGO DIST.
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1: 7500 Date NOV 1996
SO24641
District Land Registrar
Approved as to Survey
Chief Surveyor
Deposited this day of 19
SECTION 19
SECTION 15
SECTION 11
SECTION 27
SECTION 12
PT RUN 236K
C L 338/53
RUN 236N
THOMSON GORGE ROAD
DIAGRAM A
DIAG. C
SEE DIAG C
DATUM : GEODETIC 1949
CIRCUIT : LINDIS PEAK
Approved as to addition of CL 338/53

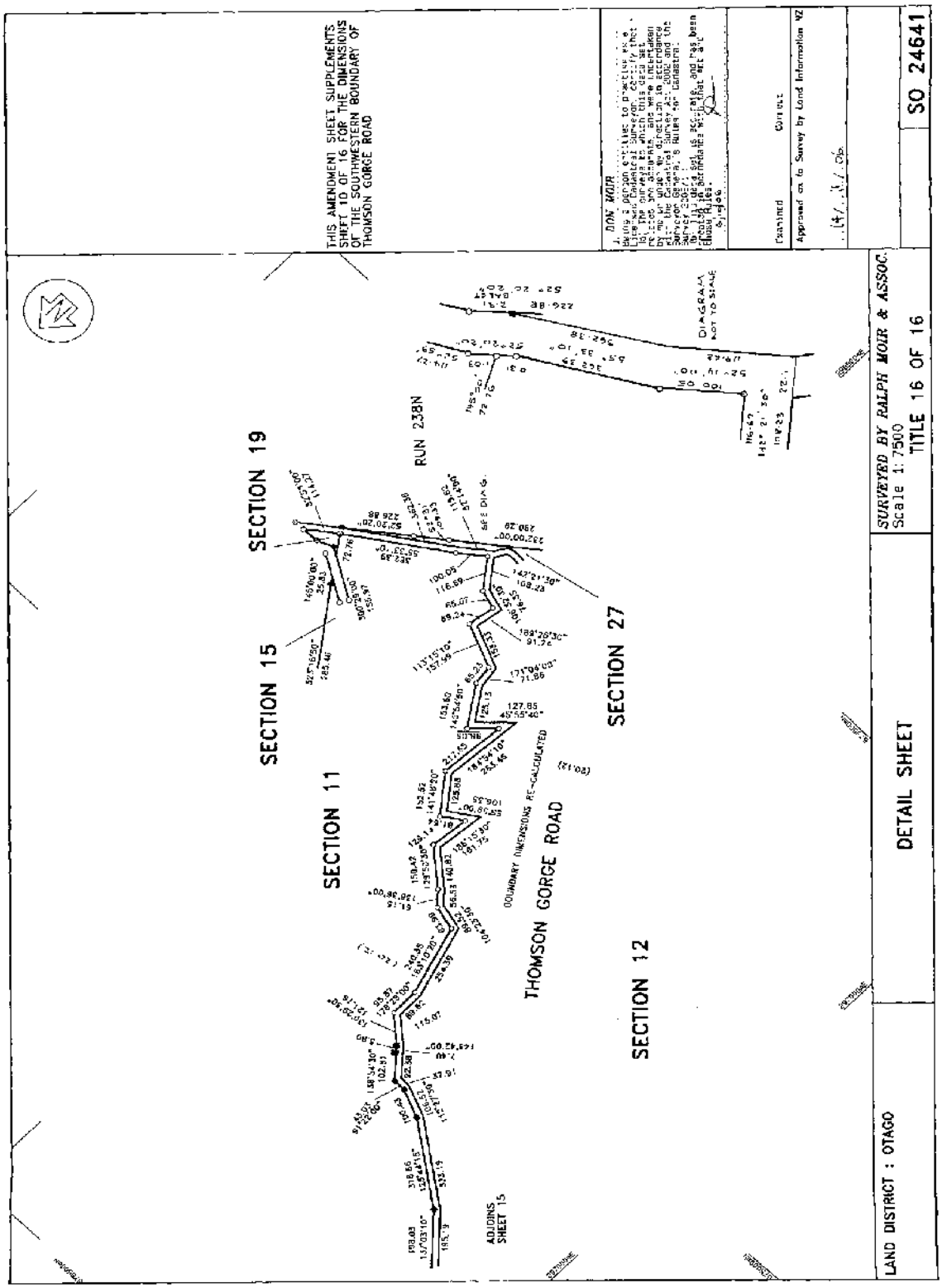

DETAIL SHEET
TERRITORIAL AUTHORITY: CENTRAL OTAGO DIST.
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:10000 Date NOV 1996
SO24641
SECTION 21
SECTION 13
SECTION 23
SECTION 25
ROAD (IRREGULAR)
DIAGRAM A
DIAG. B
DIAG. C
DIAG. D
Approved as to Survey
Chief Surveyor
Deposited this day of 19
District Land Registrar


DETAIL SHEET
TERRITORIAL AUTHORITY: CENTRAL OTAGO DIST.
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:10000 Date NOV 1996
SO24641
Approved as to Survey
Chief Surveyor
Deposited this day of 19
District Land Registrar
SECTION 12
SECTION 27
SECTION 13
SEC. 33
SEC. 32
SEC. 22
RUN 238N
PT RUN 238N
DIAG. A
SEE DIAG. A


THIS AMENDMENT SHEET SUPPLEMENTS SHEET 7 OF 16 FOR THE DIMENSIONS OF THE NORTHERN BOUNDARY OF THE ROAD HEREON ADJACENT TO SECTION 6
I, DON MOIR
Examined
Correct
Approved as to Survey by Land Information NZ
SEC 32 (SO 20026)
RUSSELL WAKEFIELD SO
SECTION 7
SECTION 25
SECTION 6
SECTION 3
ROAD
BOUNDARY DIMENSIONS RE-CALCULATED
SEC 1 BLK II
SO 23857
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:5000
TITLE 13 OF 16
DETAIL SHEET
LAND DISTRICT : OTAGO
SO 24641


THIS AMENDMENT SHEET SUPPLEMENTS SHEET 8 OF 16 FOR THE DIMENSIONS OF THE SOUTHWESTERN BOUNDARY OF THOMSON GORGE ROAD
I, DON MOIR
Examined
Correct
Approved as to Survey by Land Information NZ
ADJOINS SHEET 15
SECTION 28
SECTION 21
SECTION 9
SEC 31
THOMSON GORGE ROAD
BOUNDARY DIMENSIONS RE-CALCULATED
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1: 7500
TITLE 14 OF 16
LAND DISTRICT : OTAGO
DETAIL SHEET
SO 24641


THIS AMENDMENT SHEET SUPPLEMENTS SHEET 9 OF 16 FOR THE DIMENSIONS OF THE SOUTHWESTERN BOUNDARY OF THOMSON GORGE ROAD
I, DON MOIR
Licensed Cadastral Surveyor, certify that
Approved as to Survey by Land Information NZ
SECTION 11
SECTION 12
SECTION 14
THOMSON GORGE ROAD
ADJOINS SHEET 16
ADJOINS SHEET 14
BOUNDARY DIMENSIONS RE-CALCULATED
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:2500
TITLE 15 OF 16
LAND DISTRICT : OTAGO
DETAIL SHEET
SO 24641


THIS AMENDMENT SHEET SUPPLEMENTS SHEET 10 OF 16 FOR THE DIMENSIONS OF THE SOUTHWESTERN BOUNDARY OF THOMSON GORGE ROAD
I, DON MOIR
Examined
Approved as to Survey by Land Information NZ
SO 24641
SURVEYED BY RALPH MOIR & ASSOC.
Scale 1:7500
TITLE 16 OF 16
DETAIL SHEET
LAND DISTRICT : OTAGO
SECTION 19
SECTION 15
SECTION 11
SECTION 27
SECTION 12
RUN 238N
THOMSON GORGE ROAD
BOUNDARY DIMENSIONS RE-CALCULATED
DIAGRAM NOT TO SCALE
ADJOINS SHEET 15

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **366552**
Land Registration District **Otago**
Date Issued 11 April 2008

Prior References
328352 44931

Estate Fee Simple
Area 8.0540 hectares more or less
Legal Description Lot 3 Deposited Plan 391334

Registered Owners
Bendigo Station Developments Limited

Interests

Subject to Part IVA Conservation Act 1987

Subject to Section 11 Crown Minerals Act 1991

Irrigation Agreement under the Public Works Amendment Act 1910

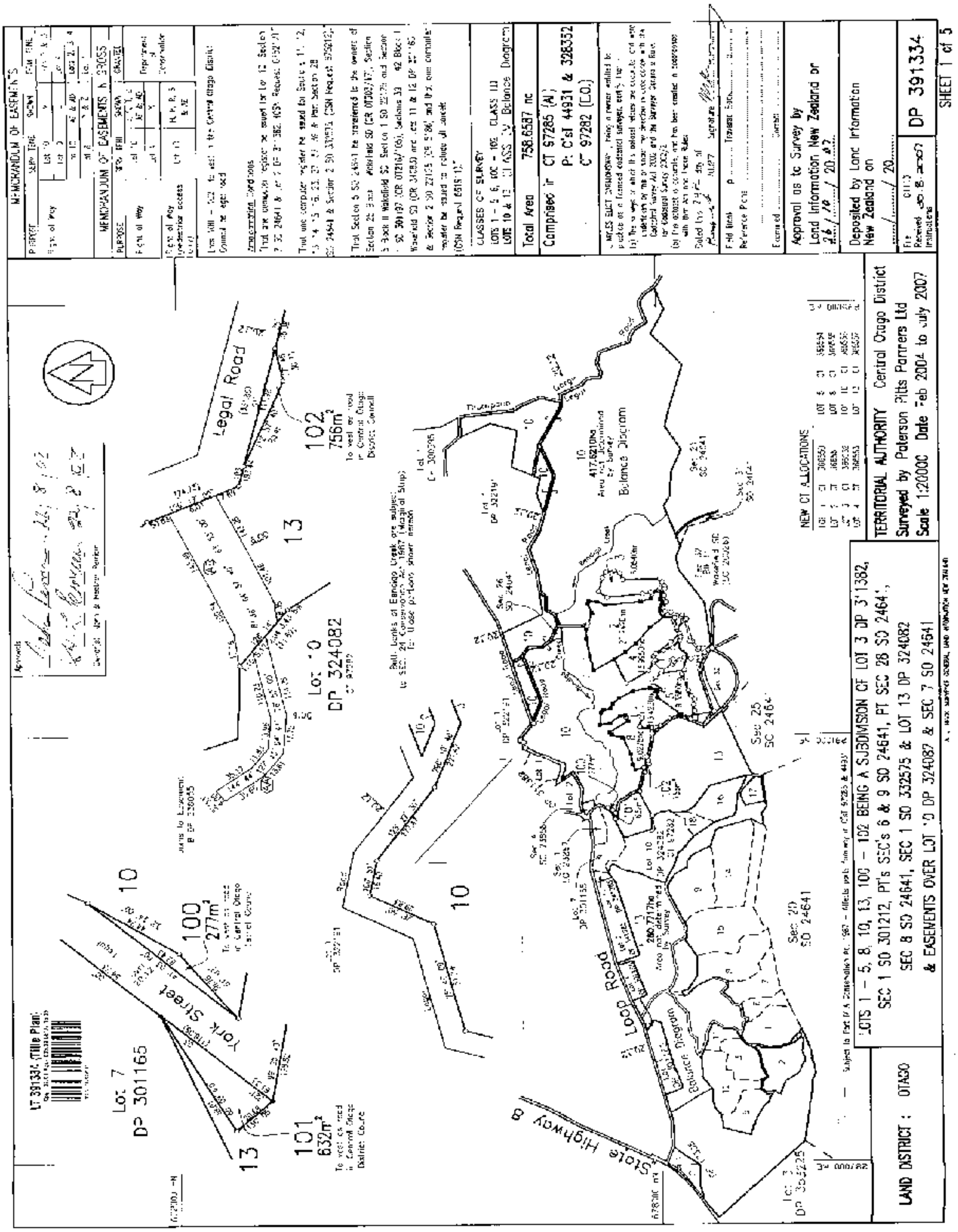
5009824.9 Conservation Covenant pursuant to Section 77 Reserves Act 1977 - 2.10.2000 at 2:44 pm

6506122.1 Notice of Access Rights under Section 83 Crown Minerals Act 1991 - 22.7.2005 at 9:00 am

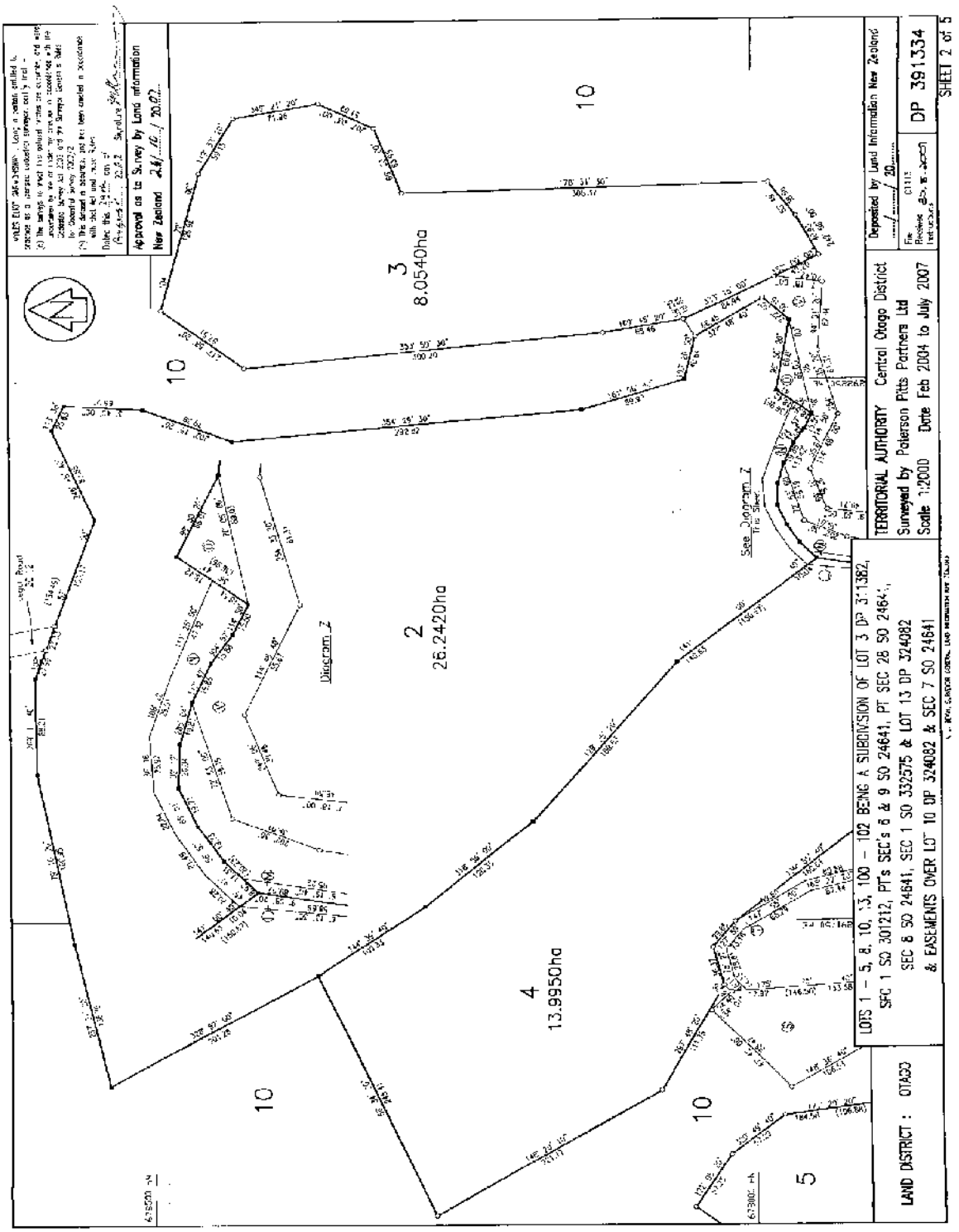
Appurtenant hereto is a right of way created by Easement Instrument 7780662.10 - 11.4.2008 at 9:00 am

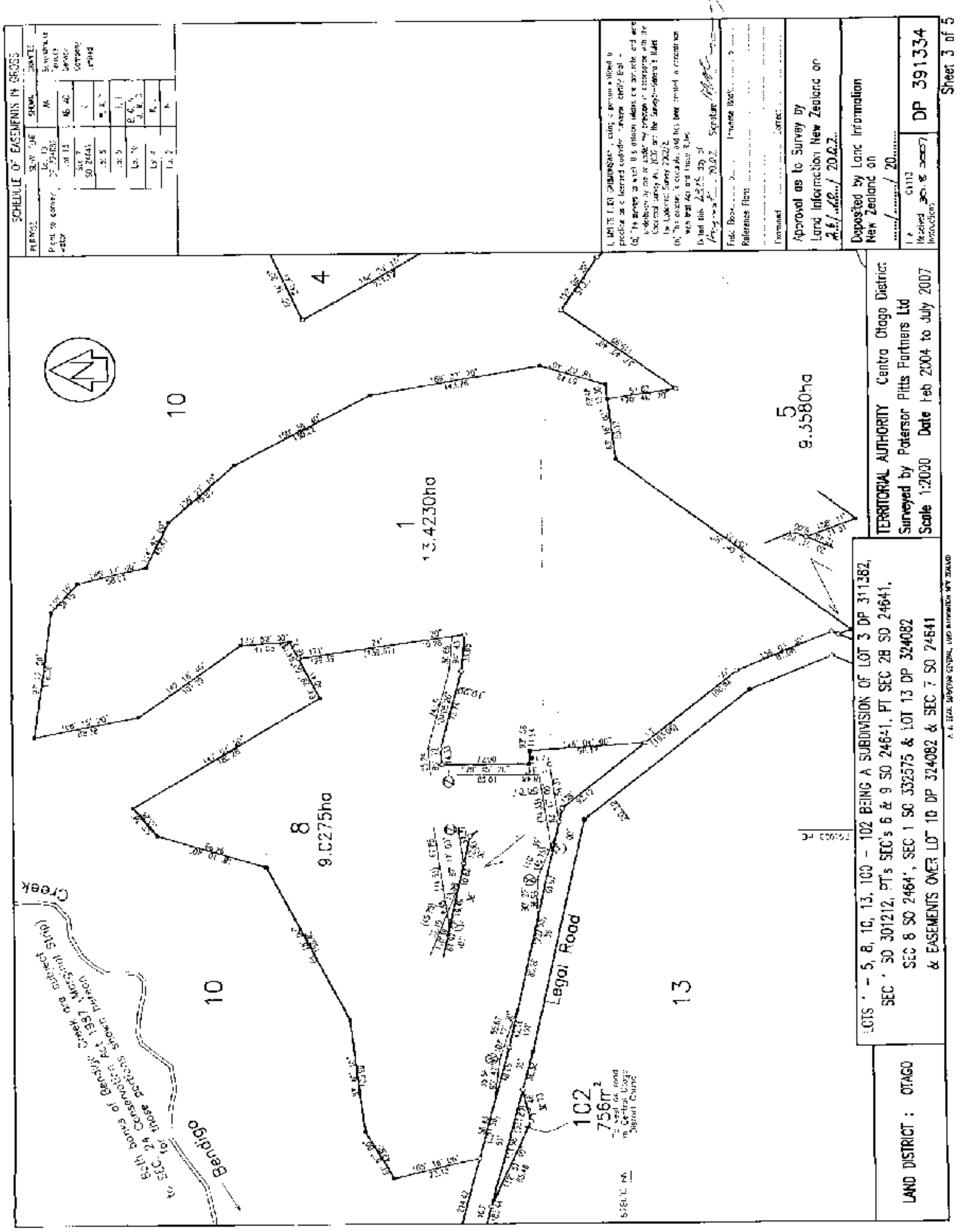
The easements created by Easement Instrument 7780662.10 are subject to Section 243 (a) Resource Management Act 1991

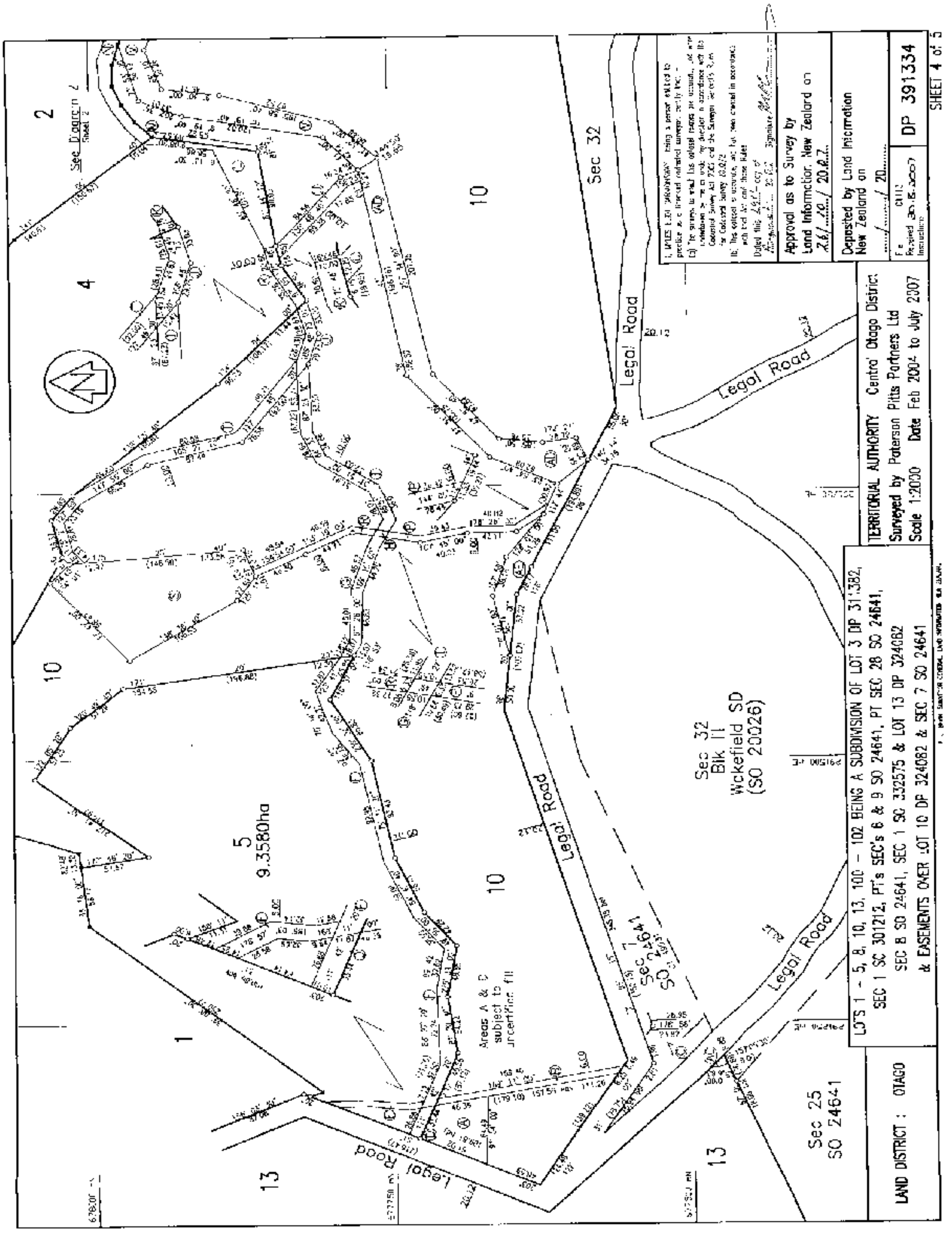
Land Covenant in Easement Instrument 7780662.13 - 11.4.2008 at 9:00 am



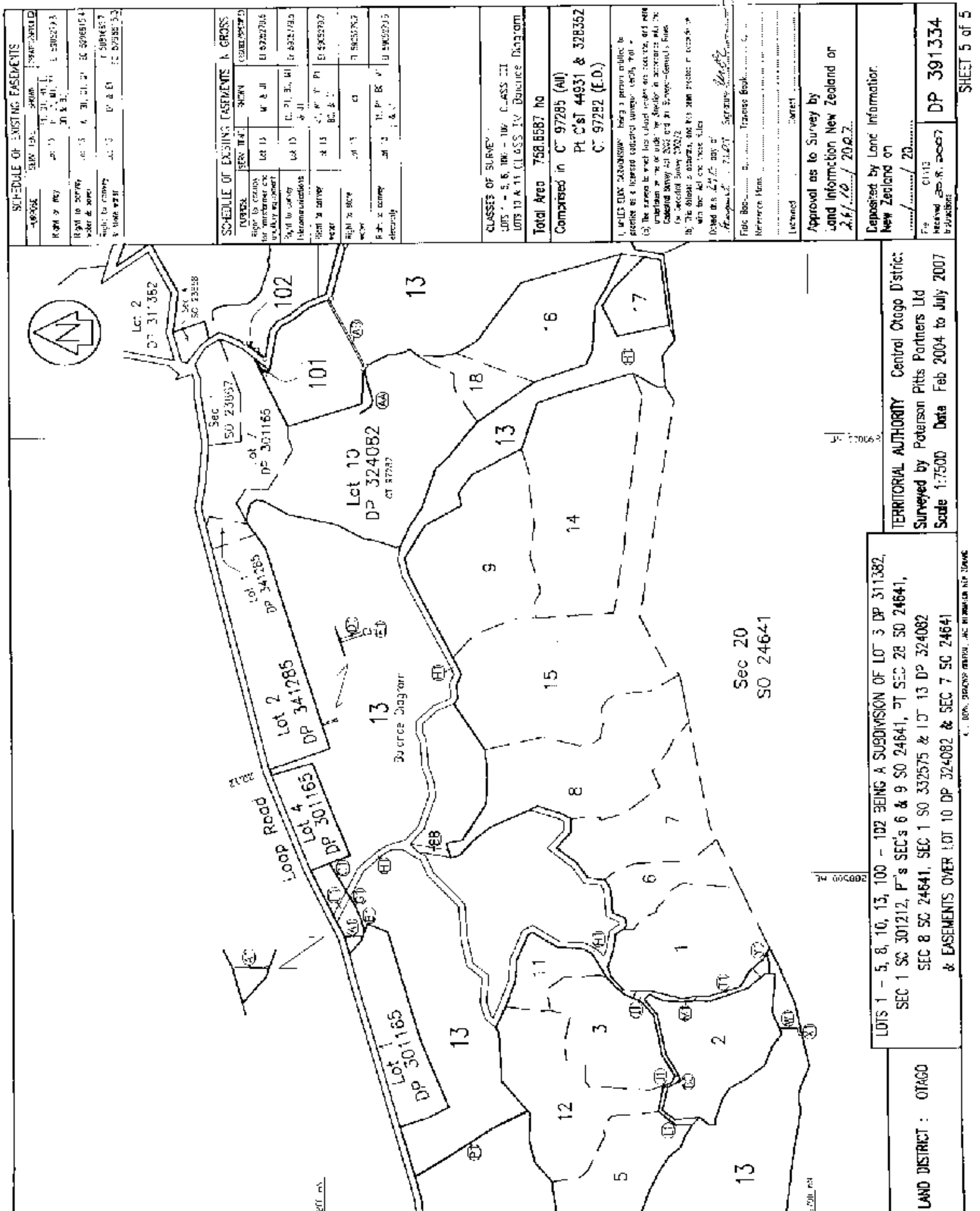
DP 391334
SHEET 1 of 5
LAND DISTRICT : OTAGO
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:20000 Date Feb 2004 to July 2007
York Street
Legal Road
Loop Road
State Highway 8
Lot 10 DP 324082
Lot 7 DP 301165
101 632m²
100 277m²
102 756m²
Balance Diagram


Approved as to Survey by Land Information New Zealand
Deposited by Land Information New Zealand
DP 391334
SHEET 2 of 5
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:2000 Dated Feb 2004 to July 2007
LOTS 1 - 5, 8, 10, 13, 100 - 102 BEING A SUBDIVISION OF LOT 3 DP 371382, SEC 1 SO 301212, PTs SEC's 6 & 9 SO 24641, PT SEC 28 SO 24641, SEC 6 SO 24641, SEC 1 SO 332575 & LOT 13 DP 324082 & EASEMENTS OVER LOT 10 DP 324082 & SEC 7 SO 24641
LAND DISTRICT : OTAGO
3
8.0540ha
2
26.2420ha
4
13.9950ha
10
5
Diagram 2
See Diagram 2


SCHEDULE OF EASEMENTS IN GROSS
Approval as to Survey by Land Information New Zealand
Deposited by Land Information New Zealand
DP 391334
Sheet 3 of 5
LOTS 1 - 5, 8, 10, 13, 100 - 102 BEING A SUBDIVISION OF LOT 3 DP 311382, SEC 1 SO 301212, PT's SEC's 6 & 9 SO 24641, PT SEC 2B SO 24641, SEC 8 SO 24641, SEC 1 SO 332575 & LOT 13 DP 324082 & EASEMENTS OVER LOT 10 DP 324082 & SEC 7 SO 24641
LAND DISTRICT : OTAGO
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:2000 Date Feb 2004 to July 2007
1
13.4230ha
5
9.3580ha
8
9.0275ha
102
756m²
4
10
13
Legal Road
Bendigo Creek



LOTS 1 – 5, 8, 10, 13, 100 – 102 BEING A SUBDIVISION OF LOT 3 DP 311382, SEC 1 SO 301212, PT's SEC's 6 & 9 SO 24641, PT SEC 28 SO 24641, SEC 8 SO 24641, SEC 1 SO 332575 & LOT 13 DP 324082 & EASEMENTS OVER LOT 10 DP 324082 & SEC 7 SO 24641
LAND DISTRICT : OTAGO
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:2000 Date Feb 2004 to July 2007
Approval as to Survey by Land Information New Zealand on
Deposited by Land Information New Zealand on
DP 391334
SHEET 4 of 5
Sec 32
Blk II
Wakefield SD
(SO 20026)
Sec 25
SO 24641
Sec 7
SO 24641
5
9.3580ha
Areas A & C subject to uncertified fill
Legal Road


SCHEDULE OF EXISTING EASEMENTS
SCHEDULE OF EXISTING EASEMENTS IN GROSS
CLASSES OF SURVEY
Total Area 758.6587 ha
Comprised in CT 97285 (All)
Pt CST 4931 & 328352
CT 97282 (E.D.)
Approval as to Survey by
Land Information New Zealand on
Deposited by Land Information New Zealand on
DP 391334
SHEET 5 of 5
LOTS 1 - 5, 8, 10, 13, 100 - 102 BEING A SUBDIVISION OF LOT 3 DP 311382,
SEC 1 SO 301212, PT's SEC's 6 & 9 SO 24641, PT SEC 28 SO 24641,
SEC 8 SO 24641, SEC 1 SO 332575 & LOT 13 DP 324082
& EASEMENTS OVER LOT 10 DP 324082 & SEC 7 SO 24641
LAND DISTRICT : OTAGO
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:7500 Date Feb 2004 to July 2007
Loop Road
Lot 2 DP 341285
Lot 4 DP 301165
Lot 1 DP 301165
Lot 10 DP 324082
Sec 20 SO 24641
13 Balance Diagram
101
102
13

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **366553**
Land Registration District **Otago**
Date Issued 11 April 2008

Prior References
328352 44931

Estate Fee Simple
Area 13.9950 hectares more or less
Legal Description Lot 4 Deposited Plan 391334

Registered Owners
Bendigo Station Developments Limited

Interests

Subject to Section 11 Crown Minerals Act 1991

Subject to Part IVA Conservation Act 1987

Irrigation Agreement under the Public Works Amendment Act 1910

5009824.9 Conservation Covenant pursuant to Section 77 Reserves Act 1977 - 2.10.2000 at 2:44 pm

6506122.1 Notice of Access Rights under Section 83 Crown Minerals Act 1991 - 22.7.2005 at 9:00 am

Subject to a right of way (in gross) over part marked K on DP 391334 in favour of Her Majesty the Queen created by Easement Instrument 7780662.9 - 11.4.2008 at 9:00 am

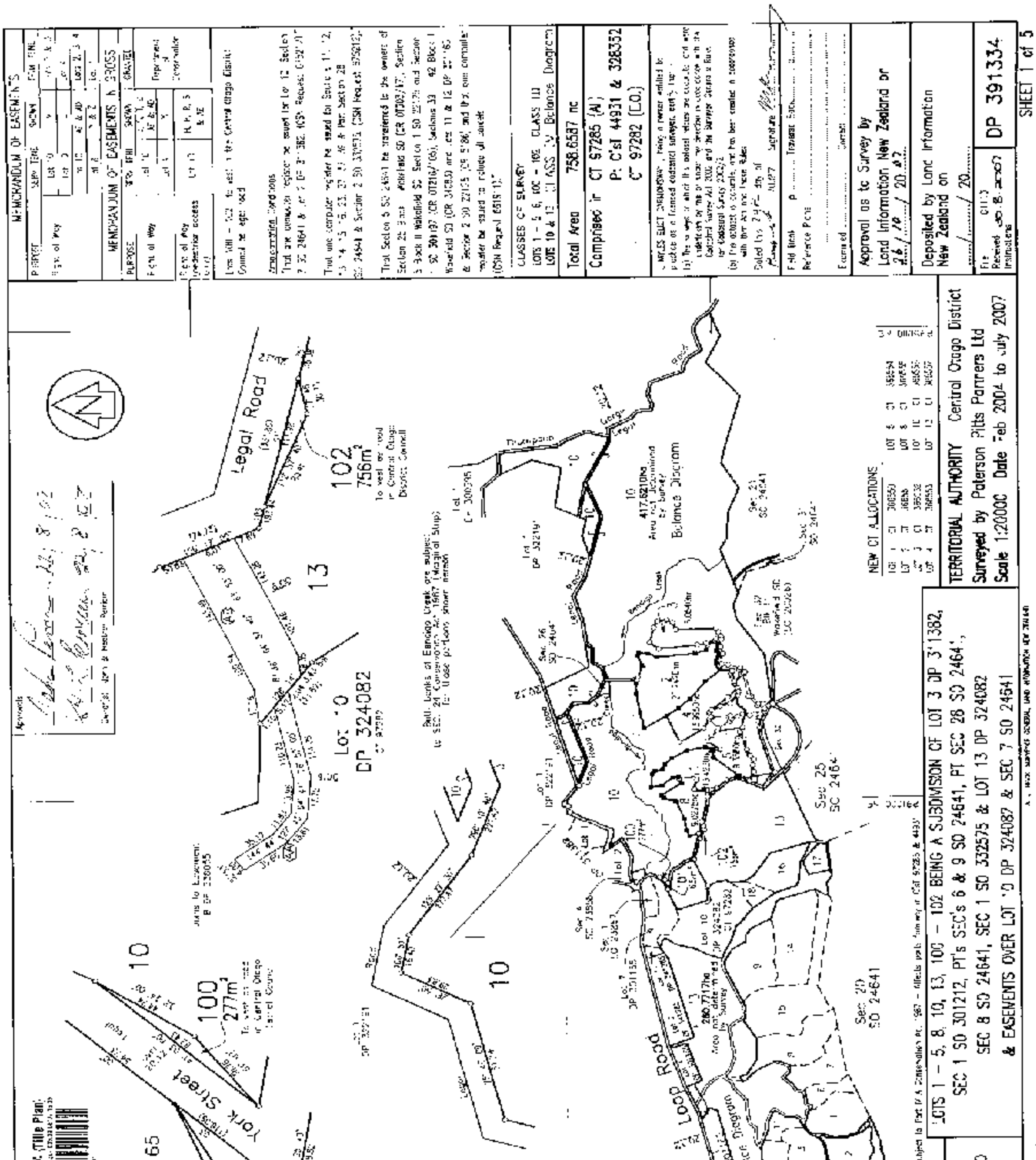
The easements created by Easement Instrument 7780662.9 are subject to Section 243 (a) Resource Management Act 1991

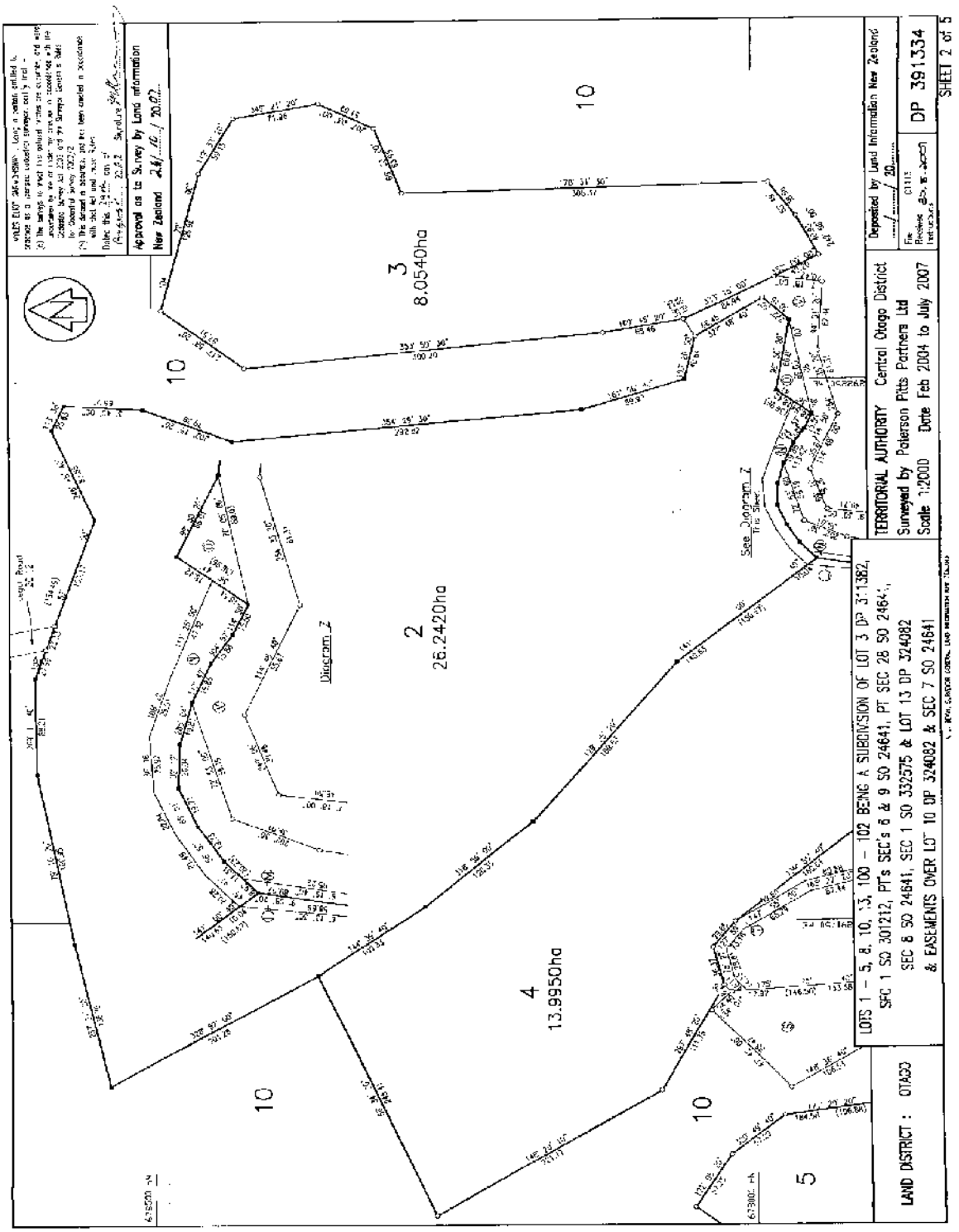
Appurtenant hereto is a right of way created by Easement Instrument 7780662.10 - 11.4.2008 at 9:00 am

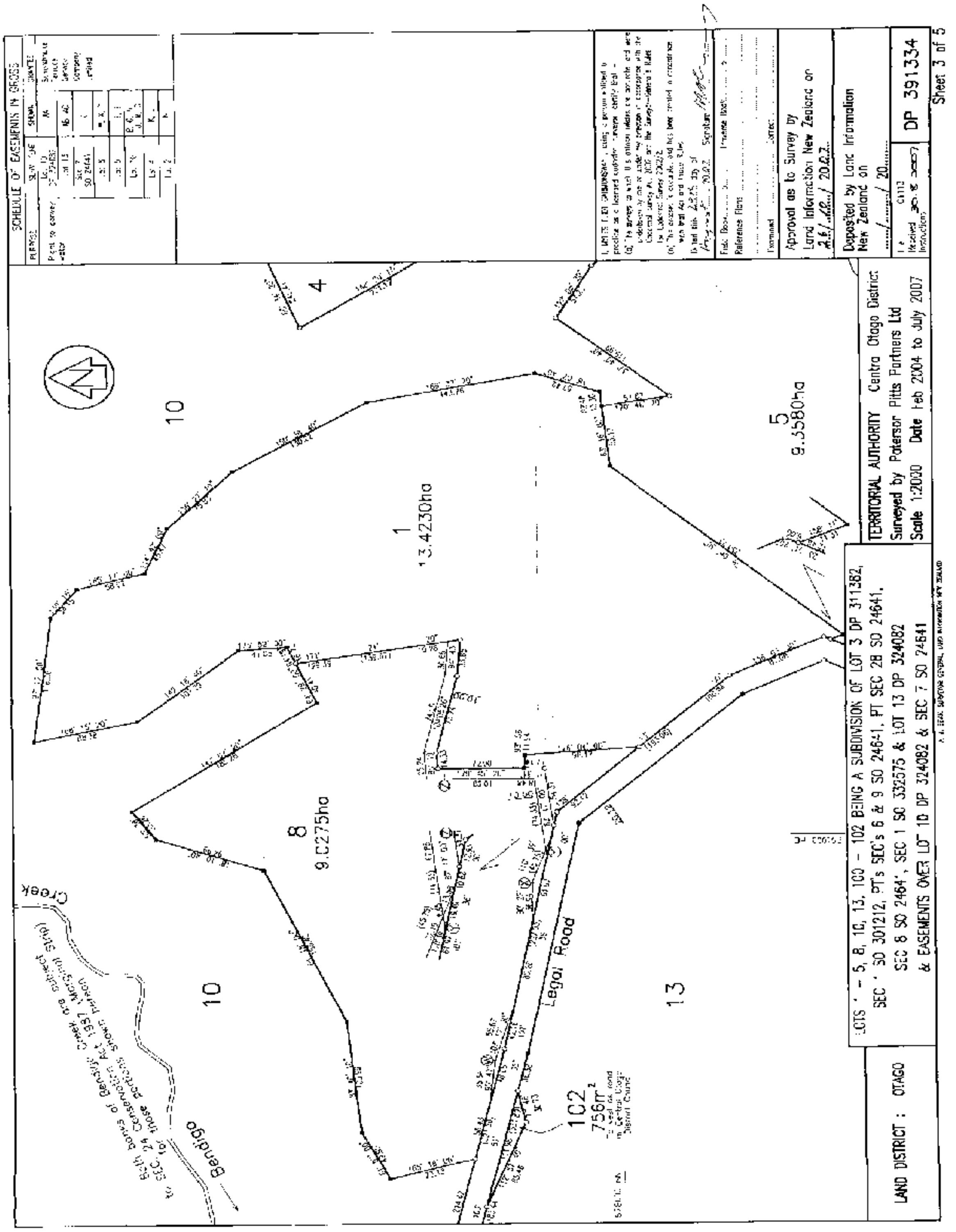
The easements created by Easement Instrument 7780662.10 are subject to Section 243 (a) Resource Management Act 1991

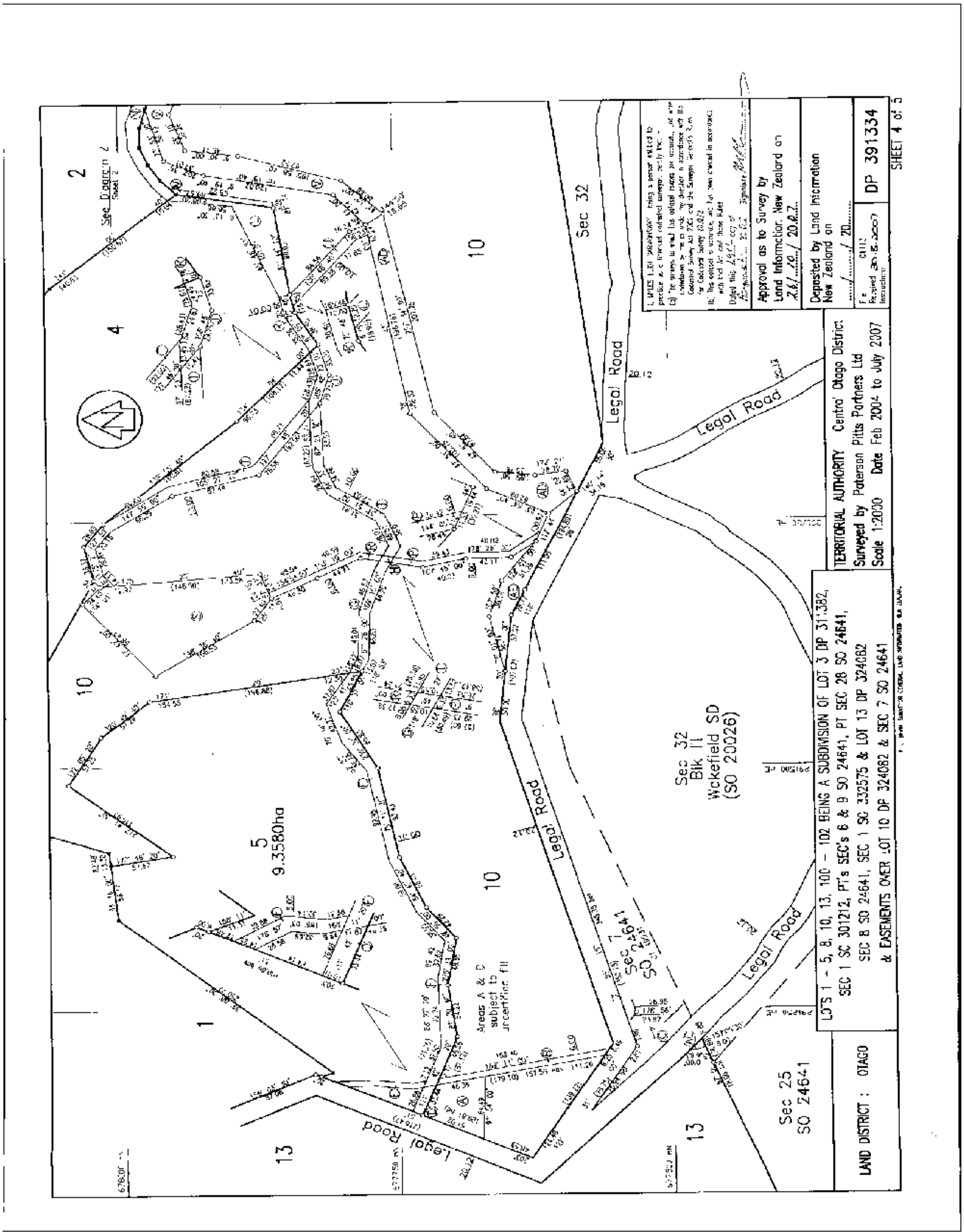
Subject to a right (in gross) to convey water over parts marked K & L on DP 391334 in favour of Schoolhouse Terrace Service Company Limited created by Easement Instrument 7780662.11 - 11.4.2008 at 9:00 am

Land Covenant in Easement Instrument 7780662.13 - 11.4.2008 at 9:00 am

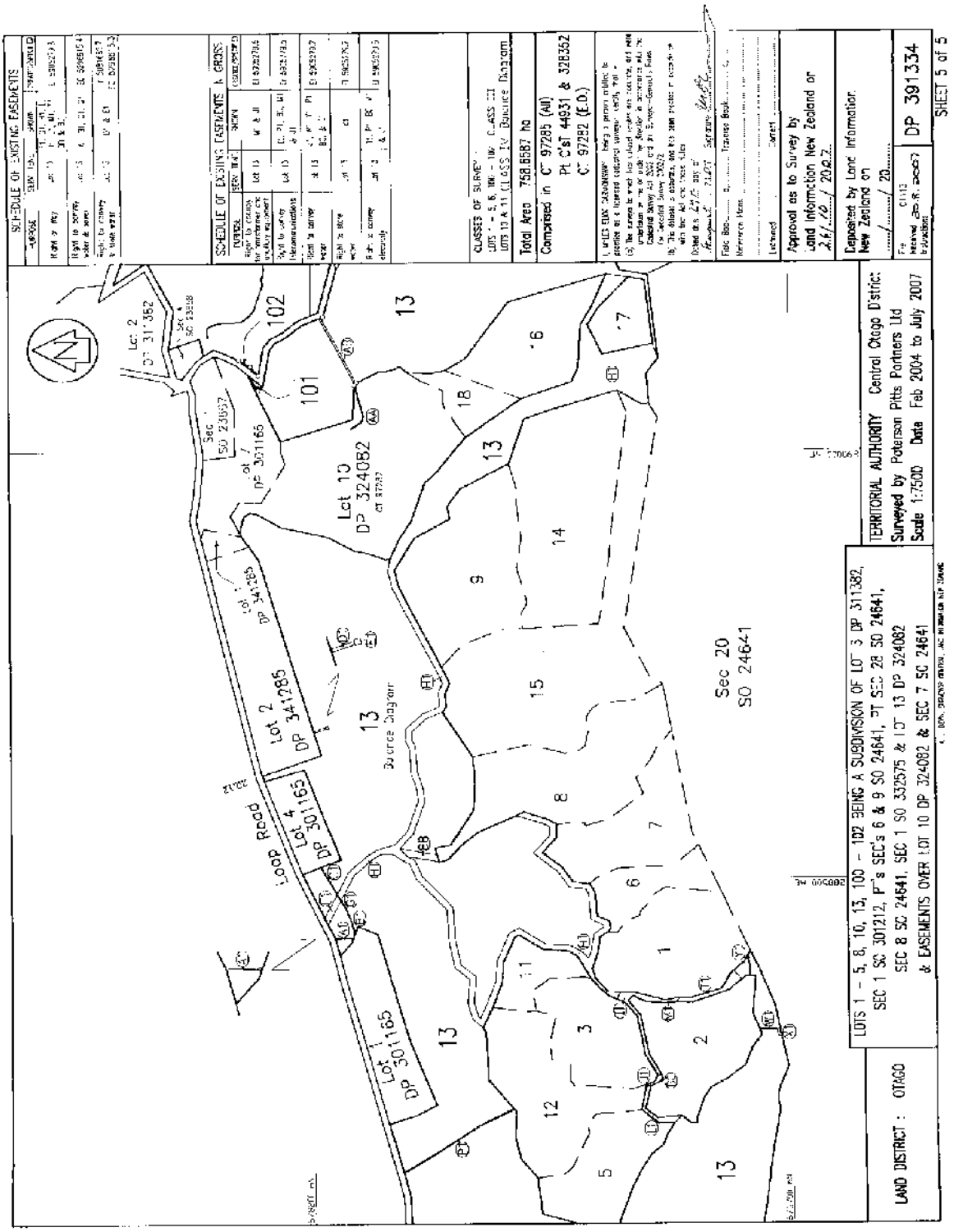

DP 391334
SHEET 1 of 5
LOTS 1 – 5, 8, 10, 13, 100 – 102 BEING A SUBDIVISION OF LOT 3 DP 301382,
SEC 1 SO 301212, PT'S SEC'S 6 & 9 SO 24641, PT SEC 28 SO 24641,
SEC 8 SO 24641, SEC 1 SO 332575 & LOT 13 DP 324082
& EASEMENTS OVER LOT 10 DP 324082 & SEC 7 SO 24641
LAND DISTRICT : OTAGO
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:2000 Date Feb 2004 to July 2007
MEMORANDUM OF EASEMENTS
Total Area 758.6587 ha
Comprised in CT 97265 (A)
CT 44931 & 328352
CT 97282 (LO)
CLASSES OF SURVEY
NEW CT ALLOCATIONS
Approval as to Survey by
Land Information New Zealand on
Deposited by Land Information New Zealand on
Legal Road
102
756m²
Lot 10
DP 324082
13
10
100
277m²
101
632m²
York Street
Lot 7
DP 301165
State Highway 8
Loop Road
Balance Diagram
Sec 25
SO 24641
Sec 28
SO 24641


Approved as to Survey by Land Information New Zealand
Deposited by Land Information New Zealand
DP 391334
SHEET 2 of 5
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:2000 Dates Feb 2004 to July 2007
LOTS 1 - 5, 8, 10, 13, 100 - 102 BEING A SUBDIVISION OF LOT 3 DP 371382, SEC 1 SO 301212, PTs SEC's 6 & 9 SO 24641, PT SEC 28 SO 24641, SEC 6 SO 24641, SEC 1 SO 332575 & LOT 13 DP 324082 & EASEMENTS OVER LOT 10 DP 324082 & SEC 7 SO 24641
LAND DISTRICT : OTAGO
Diagram 2
See Diagram 2
2
26.2420ha
3
8.0540ha
4
13.9950ha
10
5


SCHEDULE OF EASEMENTS IN GROSS
LOTS 1 - 5, 8, 10, 13, 100 - 102 BEING A SUBDIVISION OF LOT 3 DP 311382,
SEC 1 SO 301212, PT's SEC's 6 & 9 SO 24641, PT SEC 2B SO 24641,
SEC 8 SO 24641, SEC 1 SO 332575 & LOT 13 DP 324082
& EASEMENTS OVER LOT 10 DP 324082 & SEC 7 SO 24641
LAND DISTRICT : OTAGO
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:2000 Date Feb 2004 to July 2007
Approval as to Survey by Land Information New Zealand
DP 391334
Sheet 3 of 5
1
13.4230ha
5
9.3580ha
8
9.0275ha
102
756m²
Legal Road
Bendigo Creek
10
13
4



Legal Road
Sec 32
Sec 32
Blk II
Wakefield SD
(SO 20026)
5
9.3580ha
Sec 25
SO 24641
LAND DISTRICT : OTAGO
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:2000 Date Feb 2004 to July 2007
DP 391334
SHEET 4 of 5


SCHEDULE OF EXISTING EASEMENTS
SCHEDULE OF EXISTING EASEMENTS & GROSS
CLASSES OF SURVEY
Total Area 758.8587 ha
Comprised in CT 97285 (All)
Pt CSt 44931 & 328352
CT 97282 (E.D.)
Approval as to Survey by
Land Information New Zealand on
Deposited by Land Information
New Zealand on
DP 391334
SHEET 5 of 5
Lot 2 DP 341285
Lot 4 DP 301165
Lot 1 DP 301165
Lot 10 DP 324082
Sec 20 SO 24641
Loop Road
LAND DISTRICT : OTAGO
TERRITORIAL AUTHORITY Central Otago District
Surveyed by Paterson Pitts Partners Ltd
Scale 1:7500 Date Feb 2004 to July 2007

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **808254**
Land Registration District **Otago**
Date Issued 05 February 2018

Prior References
600706

Estate	Fee Simple
Area	45.7080 hectares more or less
Legal Description	Lot 7-8 Deposited Plan 517385 and Lot 3 Deposited Plan 459561

Registered Owners
Bendigo Station Limited

Interests

Subject to Part IVA Conservation Act 1987 (affects Lot 7 DP 517385)

Subject to Section 11 Crown Minerals Act 1991 (affects Lot 7 DP 517385)

Appurtenant to Lot 7 DP 517385 is a right to convey water specified in Easement Certificate 972317.4 - 29.7.1999 at 10:28 am

Appurtenant to Lot 3 DP 459561 and Lot 8 DP 517385 is a right to pump and convey water, a right to occupy bore and a right to convey electricity created by Transfer 5292258.1 - 23.7.2002 at 9:20 am

Appurtenant to Lot 3 DP 459561 and Lot 8 DP 517385 are rights of way created by Easement Instrument 5653426.2 - 11.7.2003 at 9:00 am

The easements created by Easement Instrument 5653426.2 are subject to Section 243 (a) Resource Management Act 1991

8078443.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 24.4.2009 at 10:28 am (affects Lot 3 DP 459561 and Lot 8 DP 517385)

Appurtenant to Lot 3 DP 459561 is a right of way created by Easement Instrument 8078443.5 - 24.4.2009 at 10:28 am

The easements created by Easement Instrument 8078443.5 are subject to Section 243 (a) Resource Management Act 1991

Fencing Covenant in Transfer 9205872.4 - 18.10.2012 at 5:15 pm

9362905.6 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 4.6.2013 at 5:04 pm (affects Lot 3 DP 459561 and Lot 7 DP 517385)

10591681.12 Mortgage to Bank of New Zealand - 3.11.2016 at 2:33 pm

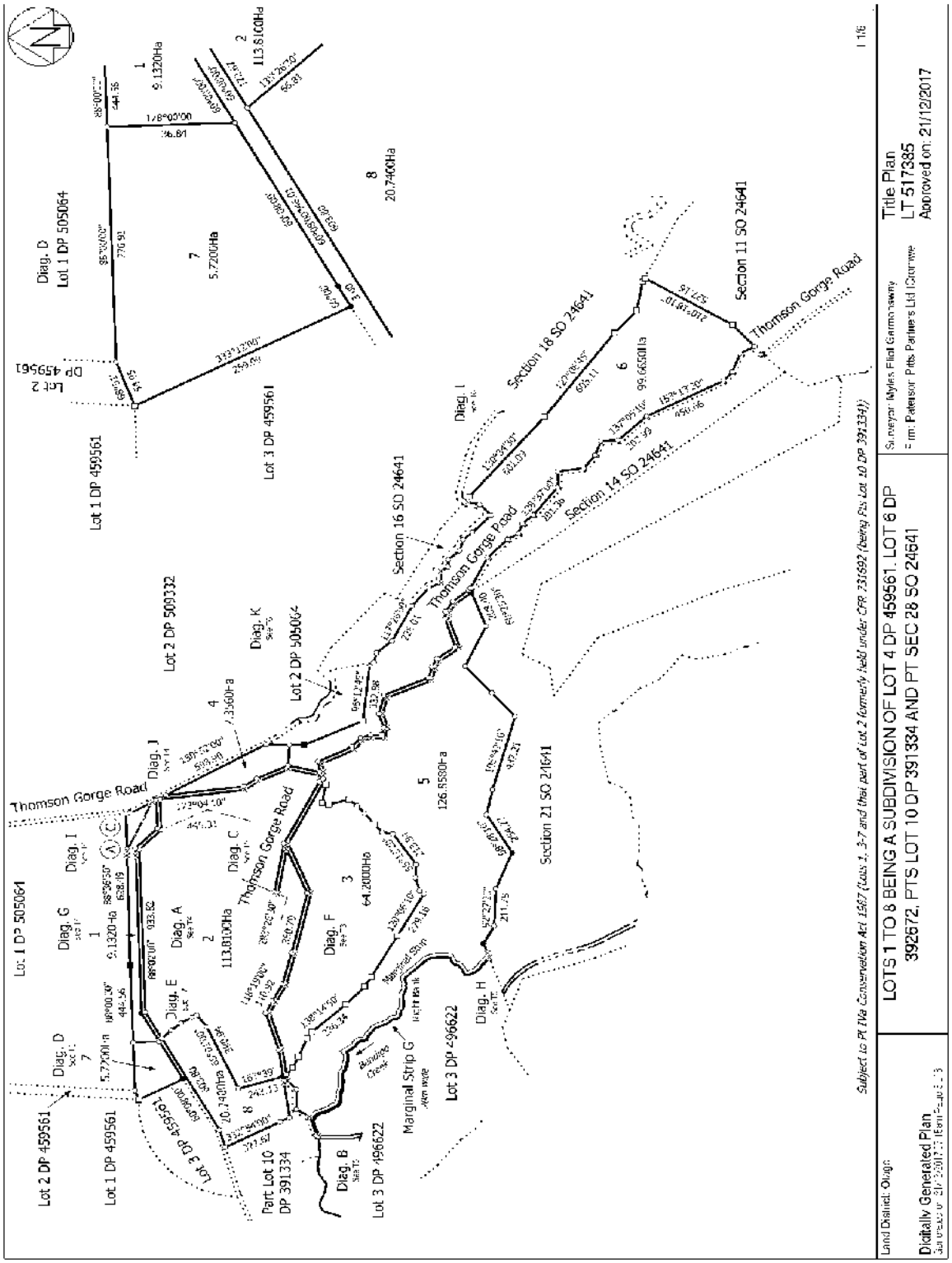
Subject to Section 241(2) Resource Management Act 1991 (affects DP 517385)

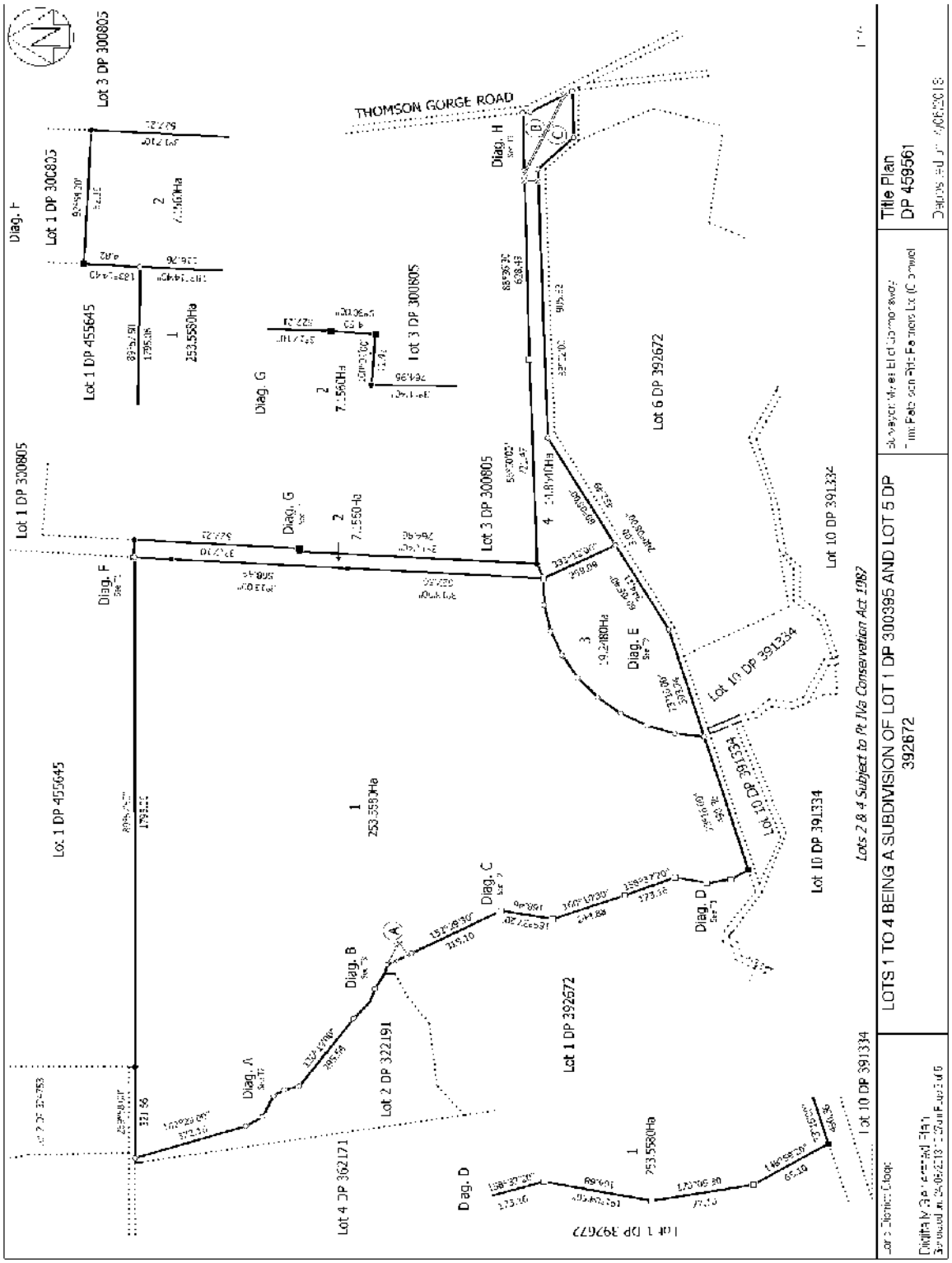
Subject to a right (in gross) to convey electricity over part Lot 8 DP 517385 marked X, Y, Z, AB, AC, AD, AE and AF and to transform electricity over part Lot 8 DP 517385 marked Y, AD and AE all on DP 529160 in favour of Aurora Energy Limited created by Easement Instrument 11462172.5 - 14.10.2019 at 10:40 am

Subject to a right (in gross) to convey telecommunications over part Lot 8 DP 517385 marked AB, AC, AD, W,Y and Z, a right to convey water over part Lot 8 DP 517385 marked W, Y, Z and AA and a right to store water over part Lot 8 DP 517385 marked AA all on DP 529160 in favour of Shine Irrigation Company Limited created by Easement Instrument 11462172.6 - 14.10.2019 at 10:40 am

Identifier **808254**

Subject to a right (in gross) to convey water over part Lot 8 DP 517385 marked AC, AE, AF and AG on DP 529160 in favour of Cherri Holdings Limited created by Easement Instrument 11462172.7 - 14.10.2019 at 10:40 am


Diag. D
Lot 1 DP 505064
Lot 1 DP 459561
Lot 3 DP 459561
Lot 2 DP 459561
Lot 2 DP 509332
Lot 2 DP 505064
Lot 3 DP 496622
Part Lot 10 DP 391334
Section 16 SO 24641
Section 18 SO 24641
Section 11 SO 24641
Section 14 SO 24641
Section 21 SO 24641
Thomson Gorge Road
Marginal Strip G
Diag. A
Diag. B
Diag. C
Diag. E
Diag. F
Diag. G
Diag. H
Diag. I
Diag. J
Diag. K
1 6.1320Ha
2 113.8100Ha
3 64.2000Ha
4 4.3960Ha
5 126.5580Ha
6 99.6650Ha
7 5.7200Ha
8 20.7400Ha
LOTS 1 TO 8 BEING A SUBDIVISION OF LOT 4 DP 459561, LOT 6 DP 392672, PTS LOT 10 DP 391334 AND PT SEC 28 SO 24641
Subject to Pt (Wa Conservation Act 1987 (Lots 1, 3-7 and that part of Lot 2 formerly held under CFR 731592 (being Pts Lot 10 DP 391334))
Land District: Otago
Digitally Generated Plan
Surveyor: Myles Flint Germanaway
Firm: Paterson Pitts Partners Ltd (Dunedin)
Title Plan
LT 517385
Approved on: 21/12/2017


THOMSON GORGE ROAD
Lot 1 DP 300805
Lot 3 DP 300805
Lot 1 DP 455645
Lot 6 DP 392672
Lot 10 DP 391334
Lot 1 DP 392672
Lot 2 DP 322191
Lot 4 DP 362171
Diag. A
Diag. B
Diag. C
Diag. D
Diag. E
Diag. F
Diag. G
Diag. H
LOTS 1 TO 4 BEING A SUBDIVISION OF LOT 1 DP 300395 AND LOT 5 DP 392672
Title Plan DP 459561
Lots 2 & 4 Subject to Pt IVa Conservation Act 1987

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **808256**
Land Registration District **Otago**
Date Issued 05 February 2018

Prior References
417678

Estate	Fee Simple
Area	2319.1924 hectares more or less
Legal Description	Section 11-16, 23, 27, 37, 39 Survey Office Plan 24641 and Section 2 Survey Office Plan 332575 and Lot 6 Deposited Plan 517385

Registered Owners
Bendigo Station Limited

Interests

Subject to Part IVA Conservation Act 1987 (affects Sections 11-16, 23, 27, 37 & 39 SO 24641 and Lot 6 DP 517385)

Subject to Section 11 Crown Minerals Act 1991 (affects Sections 11-16, 23, 27, 37 & 39 SO 24641 and Lot 6 DP 517385)

Irrigation Agreement under the Public Works Amendment Act 1910 (affects Sections 11-16, 23, 27, 37 & 39 SO 24641 and Lot 6 DP 517385)

Subject to a right to convey water over part Section 13 SO 24641 shown as a black line on the diagram attached to Transfer 434616 - 16.12.1974 at 2:00 pm

5009824.9 Conservation Covenant pursuant to Section 77 Reserves Act 1977 - 2.10.2000 at 2:44 pm (affects Sections 11-16, 23, 27, 37 & 39 SO 24641 and Lot 6 DP 517385)

Appurtenant to Section 23 SO 24641 is a right of way created by Easement Instrument 6526947.5 - 9.8.2005 at 9:00 am

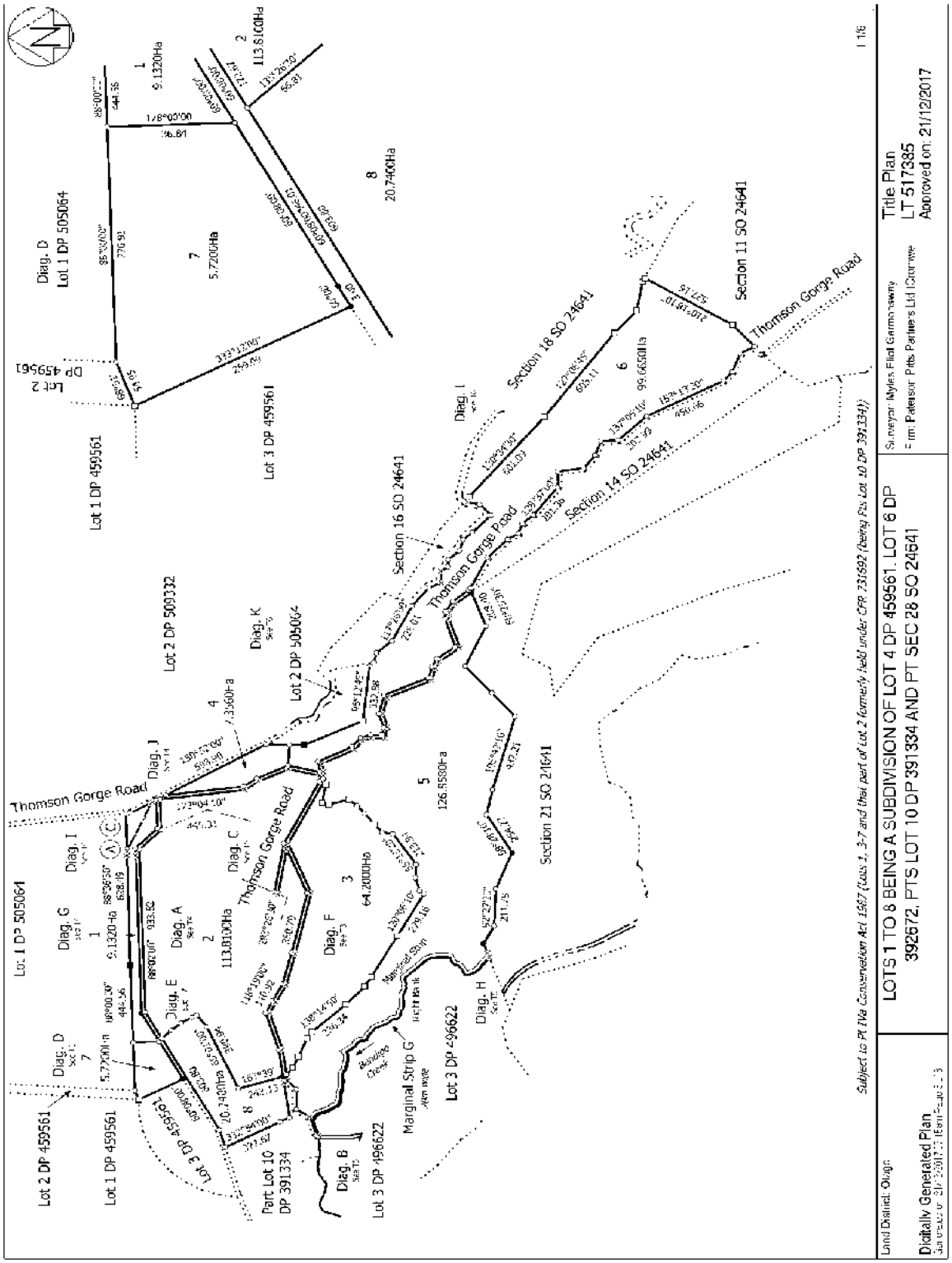
Appurtenant to Section 13 SO 24641 is a right of way created by Easement Instrument 6526947.6 - 9.8.2005 at 9:00 am

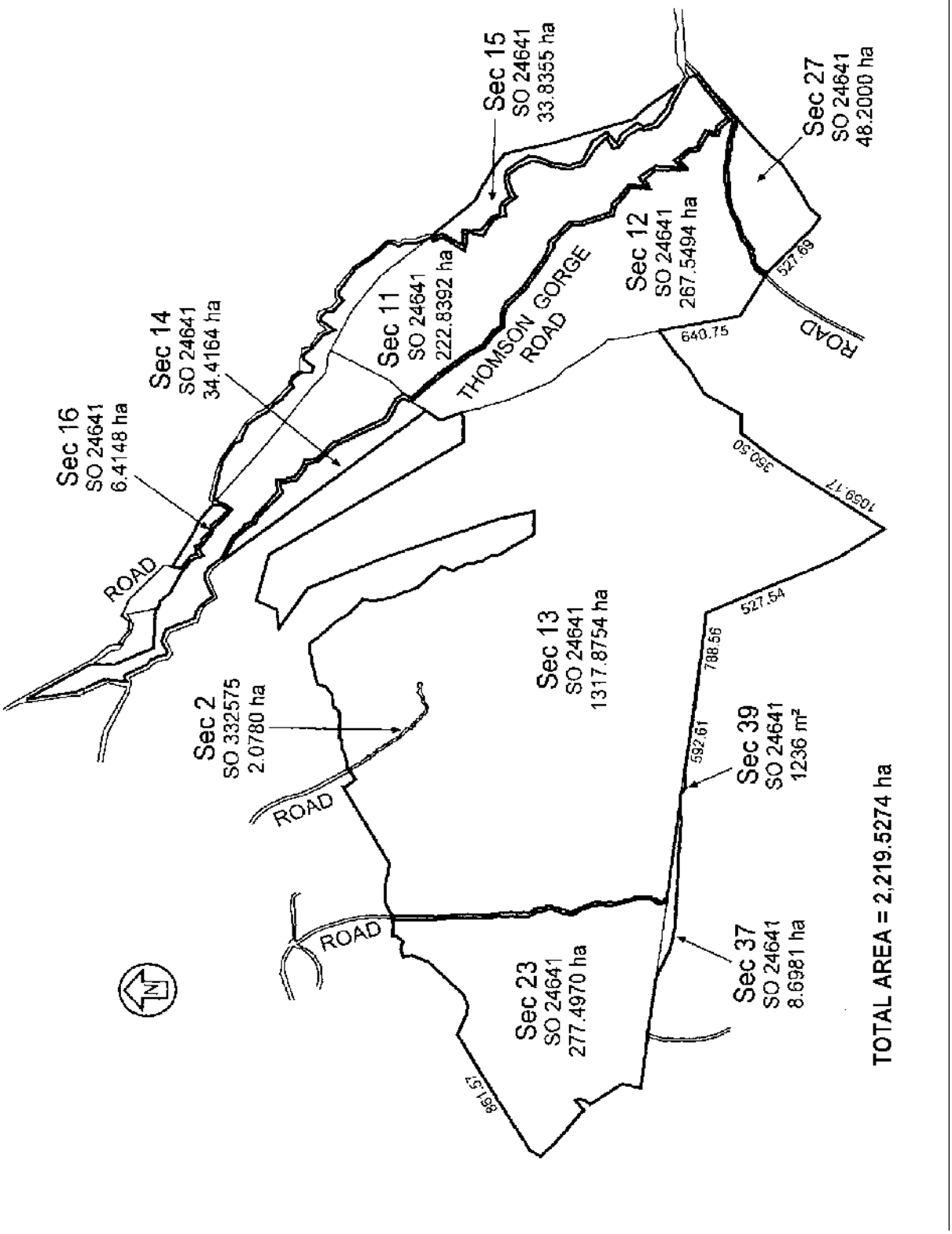
Appurtenant to Section 13 SO 24641 is a right of way created by Easement Instrument 6526947.7 - 9.8.2005 at 9:00 am

10591681.12 Mortgage to Bank of New Zealand - 3.11.2016 at 2:33 pm

Subject to Section 241(2) Resource Management Act 1991 (affects DP 517385)

11023478.1 Notice of Access Rights pursuant to Section 83 Crown Minerals Act 1991 - 7.2.2018 at 1:20 pm


Title Plan
LT 517385
Approved on: 21/12/2017
LOTS 1 TO 8 BEING A SUBDIVISION OF LOT 4 DP 459561, LOT 6 DP 392672, PTS LOT 10 DP 391334 AND PT SEC 28 SO 24641
Digitally Generated Plan
Thomson Gorge Road
Lot 1 DP 459561
Lot 2 DP 459561
Lot 3 DP 459561
Lot 2 DP 509332
Lot 2 DP 505064
Lot 1 DP 505064
Lot 3 DP 496622
Part Lot 10 DP 391334
Section 16 SO 24641
Section 18 SO 24641
Section 14 SO 24641
Section 21 SO 24641
Section 11 SO 24641
Marginal Strip G
Subject to Pt the Conservation Act 1987 (Lots 1, 3-7 and that part of Lot 2 formerly held under CFR 731592 (being Pts Lot 10 DP 391334))


Sec 15
SO 24641
33.8355 ha
Sec 27
SO 24641
48.2000 ha
Sec 12
SO 24641
267.5494 ha
Sec 11
SO 24641
222.8392 ha
Sec 14
SO 24641
34.4164 ha
Sec 16
SO 24641
6.4148 ha
THOMSON GORGE ROAD
ROAD
527.69
640.75
350.50
1059.17
527.54
788.56
592.61
Sec 13
SO 24641
1317.8754 ha
Sec 2
SO 332575
2.0780 ha
Sec 39
SO 24641
1236 m²
ROAD
ROAD
Sec 23
SO 24641
277.4970 ha
Sec 37
SO 24641
8.6981 ha
891.57
N
TOTAL AREA = 2,219.5274 ha

Project Memorandum

22 May 2020

Landpro Reference: S15298
Council Reference: RM20.079

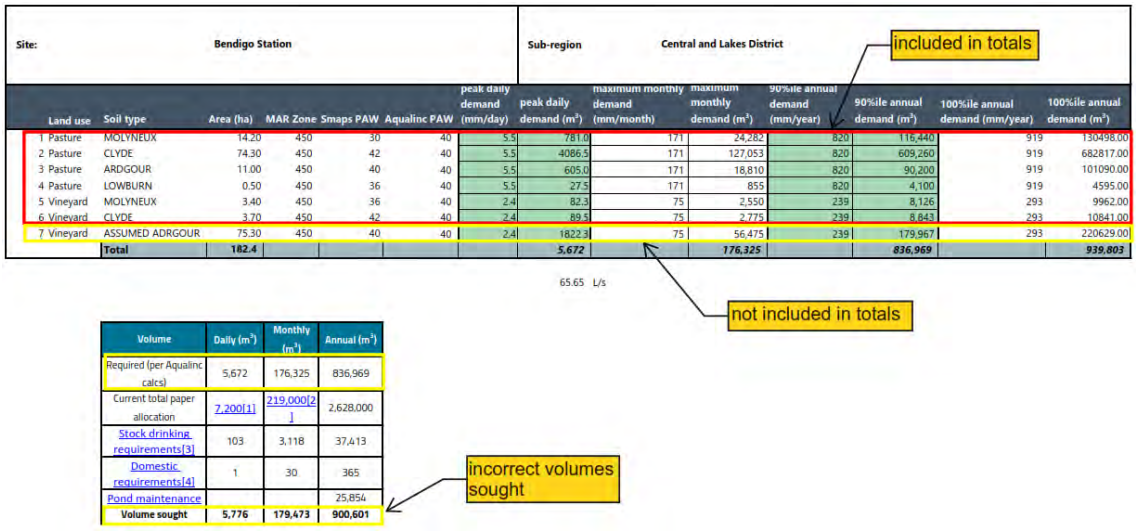
To: Charles Horrell

From: Will Nicolson

Subject: Revised Aqualinc water use efficiency calculations

Dear Charles,

It has recently come to our attention that an error has been made with regards to the Aqualinc water use efficiency calculations provided in Section 6.6 and Appendix E of the AEE provided as part of the consent replacements application (RM20.079). While the Aqualinc table presented in Appendix E does present all of the irrigation areas and their individual water needs, we noticed that the daily, monthly and annual totals did not include all of the irrigation areas (see original table below).



Site:	Bendigo Station						Sub-region	Central and Lakes District					
Land use	Soil type	Area (ha)	MAR Zone	Smaps PAW	Aqualinc PAW	peak daily demand (mm/day)	peak daily demand (m^3)	maximum monthly demand (mm/month)	maximum monthly demand (m^3)	90%ile annual demand (mm/year)	90%ile annual demand (m^3)	100%ile annual demand (mm/year)	100%ile annual demand (m^3)
1 Pasture	MOLYNEUX	14.20	450	30	40	5.5	781.0	171	24,282	820	116,440	919	130498.00
2 Pasture	CLYDE	74.30	450	42	40	5.5	4086.5	171	127,053	820	609,260	919	682817.00
3 Pasture	ARDGOUR	11.00	450	40	40	5.5	605.0	171	18,810	820	90,200	919	101090.00
4 Pasture	LOWBURN	0.50	450	36	40	5.5	27.5	171	855	820	4,100	919	4595.00
5 Vineyard	MOLYNEUX	3.40	450	36	40	2.4	82.3	75	2,550	239	8,126	293	9962.00
6 Vineyard	CLYDE	3.70	450	42	40	2.4	89.5	75	2,775	239	8,843	293	10841.00
7 Vineyard	ASSUMED ADRGOUR	75.30	450	40	40	2.4	1822.3	75	56,475	239	179,967	293	220629.00
	Total	**182.4**					***5,672***		***176,325***		***836,969***		***939,803***

65.65 L/s

included in totals

not included in totals

Volume	Daily (m^3)	Monthly (m^3)	Annual (m^3)
Required (per Aqualinc calcs)	5,672	176,325	836,969
Current total paper allocation	7,200[1]	219,000[2]	2,628,000
Stock drinking requirements[3]	103	3,118	37,413
Domestic requirements[4]	1	30	365
Pond maintenance			25,854
Volume sought	**5,776**	**179,473**	**900,601**

incorrect volumes sought

As a result, approximately 75 ha of irrigable land was not included in the monthly and annual Aqualinc requirements presented in Table 4 of Section 6.6. This would create a significant water deficiency for the applicant, therefore a revised Table 4 is provided below, while an updated Appendix E is attached. It is requested that you please assess the application against these latest figures, rather than those provided in the original application. Note that while the monthly and annual volumes sought have been updated to reflect the additional irrigable areas, there is no proposed change to the instantaneous rate of take (primary or supplementary) sought.

Table 4: Aqualinc modelled application requirements for existing and future irrigated areas of Bendigo Station Ltd, compared to total existing paper allocation from Bendigo Creek (Revised 22 May 2020 – amended values have been highlighted)

Volume	Daily (m^3)	Monthly (m^3)	Annual (m^3)
Current total paper allocation	7,200[1]	219,000[2]	2,628,000
Required (per Aqualinc calcs)	7,598	232,800	1,016,936 (90% ile)
Stock drinking requirements[3]	103	3,118	37,413
Domestic requirements[4]	1	30	365
Pond maintenance requirements[5]	-	-	25,854
Volume sought	**-**	**235,948**	**1,080,568**

Note that the monthly and annual volumes mentioned at the end of Section 2.3 of the AEE would also change to reflect these new volumes. All of the reasoning behind these volumes sought remains the same.

Finally, the proposed consent condition relating to the maximum volumes in Section 6.12 of the AEE would also need to be revised, as follows:

> *The volume of water taken under this consent shall not exceed:*
> - *235,948 m^3/month*
> - *1,080,568 m^3/year*

If you have any further questions about these revisions, please do not hesitate to reach out.

Kind Regards

Will Nicolson

Scientist/Resource Management Planner

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[1] Based on 300,000 L/hour combined limit for Deemed Permits WR1233Cr & WR3908Cr.
[2] No monthly or annual limit is specified on the current permits – these figures have been calculated based on the specified hourly rate.
[3] Based on 11,500 sheep @ 5 L/head/day & 1000 beef cattle @ 45 L/head/day (at peak capacity)
[4] For 1 house, based on 4-person household @ 250 L/person/day
[5] Calculated for 5 months outside the irrigation season (April 15-September 15). Seepage losses with a clay liner would average 4.5 mm/day (0.0045 m/day) while evaporation from the ~23,000 m^2 pond surface area may average ~2 cm/week (0.0029 m/day). Potential water loss = (0.0045+0.0029)*23,000 = 170 m^3/day (~2 L/s). Total potential pond loss outside irrigation season = 152 days x 170 m^3/day = 25,854 m^3

Appendix E: Aqualinc calculations (Revised 22 May 2020)

Site:	Bendigo Station	Sub-region	Central and Lakes District

	Land use	Soil type	Area (ha)	MAR Zone	Smaps PAW	Aqualinc PAW	peak daily demand (mm/day)	peak daily demand (m^3)	maximum monthly demand (mm/month)	maximum monthly demand (m^3)	90%ile annual demand (mm/year)	90%ile annual demand (m^3)	100%ile annual demand (mm/year)	100%ile annual demand (m^3)
1	Pasture	MOLYNEUX	14.20	450	30	40	5.5	781.0	171	24,282	820	116,440	919	130498.00
2	Pasture	CLYDE	74.30	450	42	40	5.5	4086.5	171	127,053	820	609,260	919	682817.00
3	Pasture	ARDGOUR	11.00	450	40	40	5.5	605.0	171	18,810	820	90,200	919	101090.00
4	Pasture	LOWBURN	0.50	450	36	40	5.5	27.5	171	855	820	4,100	919	4595.00
5	Vineyard	MOLYNEUX	3.40	450	36	40	2.4	82.3	75	2,550	239	8,126	293	9962.00
6	Vineyard	CLYDE	3.70	450	42	40	2.4	89.5	75	2,775	239	8,843	293	10841.00
7	Vineyard	ASSUMED ADRGOUR	75.30	450	40	40	2.4	1822.3	75	56,475	239	179,967	293	220629.00
		Total	**182.4**					***7,494***		***232,800***		***1,016,936***		***1,160,432***

86.74 L/s

Volume	Daily (m^3)	Monthly (m^3)	Annual (m^3)
Required (per Aqualinc calcs)	7,494	232,800	1,016,936
Current total paper allocation	7,200[1]	219,000[2]	2,628,000
Stock drinking requirements[3]	103	3,118	37,413
Domestic requirements[4]	1	30	365
Pond maintenance			25,854
Volume sought	**7,598**	**235,948**	**1,080,568**

2 Application To Dam Water

Otago Regional Council

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:*_____
- ☒ 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): _____

See attached AEE

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. See AEE

(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.

(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^3/s)

(c) Mean annual low flow of watercourse (MALF) *(if known)*: _____(l/s or m^3/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^3/s)

(f) Flow for 100 year return period flood *(if known)*_____(l/s or m^3/s)

(g) Flow for 100 year plus/super design event *(if known)*_____(l/s or m^3/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): _____

❑ 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):

_____

_____

(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 ❑

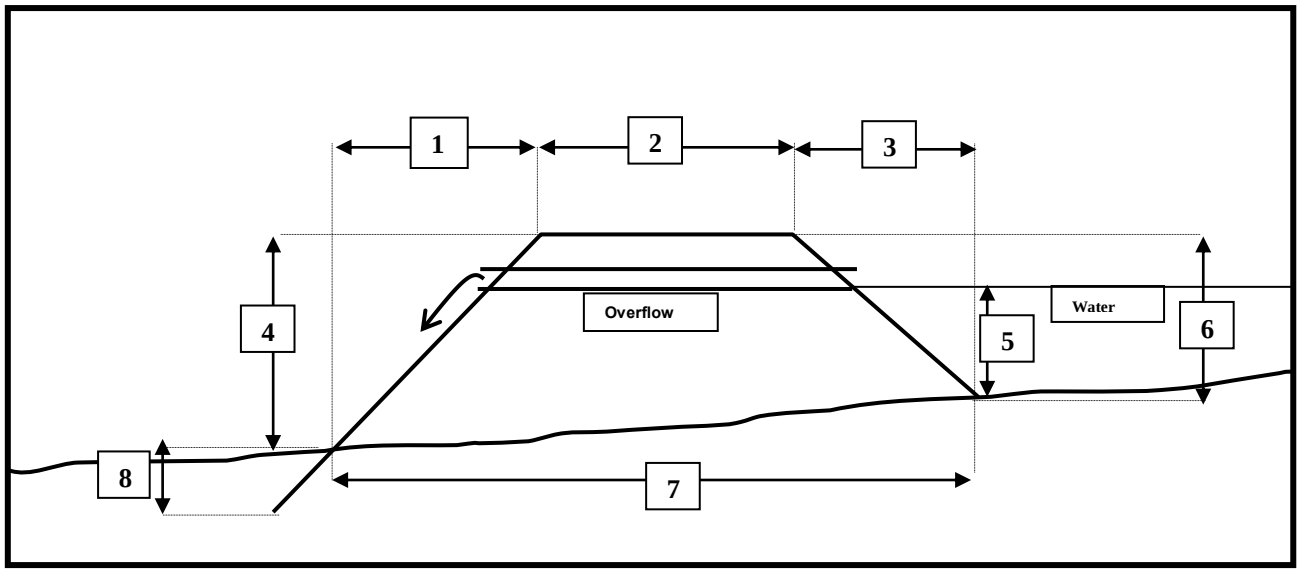
(iii) View upstream of the dam site ❑

(iv) View downstream of the dam site ❑

(v) Other (anything else of relevance) ❑

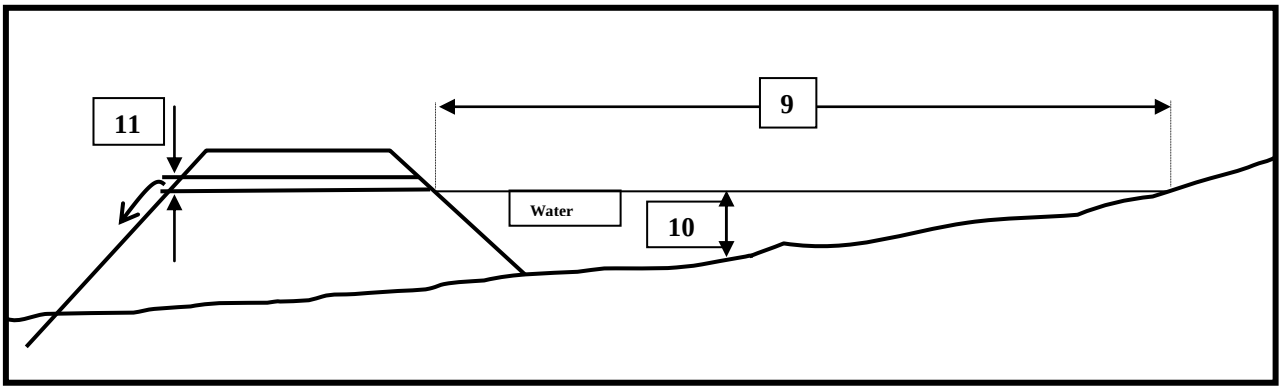
D.2 Dam Design and Dimensions

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:
    _____
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

See AEE

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?

_____

_____

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

_____

_____

_____

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.

_____

_____

_____

_____

_____

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:

_____

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

_____

_____

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

Estimated flow rate of design flood event: _____m^3/s

Any other comments:_____

_____

_____

_____

_____

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

❑ No (detail why):_____

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):_____

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

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):_____

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?	❑ Yes	❑ No	❑ Unknown
(ii) Areas where food is gathered from the water body?	❑ Yes	❑ No	❑ Unknown
(iii) Natural Wetlands?	❑ Yes	❑ No	❑ Unknown
(iv) Waste discharges (e.g., dairy sheds, industrial, sewage)?	❑ Yes	❑ No	❑ Unknown
(v) Recreational activities (e.g., swimming, fishing, canoeing?)	❑ Yes	❑ No	❑ Unknown
(vi) Areas of special aesthetic value (e.g. waterfalls)?	❑ Yes	❑ No	❑ Unknown
(vii) Areas or aspects of significance to Iwi?	❑ Yes	❑ No	❑ Unknown
(viii) Other water takes?	❑ Yes	❑ No	❑ 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	❑	Yes	❑	No	❑ Not Applicable
(b)	Recreational water users	❑	Yes	❑	No	❑ Not Applicable
(c)	Fish and Game Council	❑	Yes	❑	No	❑ Not Applicable
(d)	Iwi	❑	Yes	❑	No	❑ Not Applicable
(e)	Neighbouring landowners	❑	Yes	❑	No	❑ Not Applicable
(f)	Department of Conservation	❑	Yes	❑	No	❑ Not Applicable
(g)	Other *(e.g. Forest & Bird, LINZ)*	❑	Yes	❑	No	❑ Not Applicable

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

_____

_____

_____

_____

_____

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

_____

_____

_____

_____

*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

_____

_____

_____

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

_____

_____

_____

_____

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:

_____

_____

_____

_____

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)*

_____

_____

_____

_____

_____

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).

_____

_____

_____

_____

_____

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) ❑

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). 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

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

Dear Charles,

The following information is provided in response to your May 14th 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, Cherri Holdings Ltd (formerly Cherry Holdings Ltd).

0800 023 318
13 Pinot Noir Drive
PO Box 302
Cromwell 9342
Central Otago, NZ
info@landpro.co.nz
landpro.co.nz

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

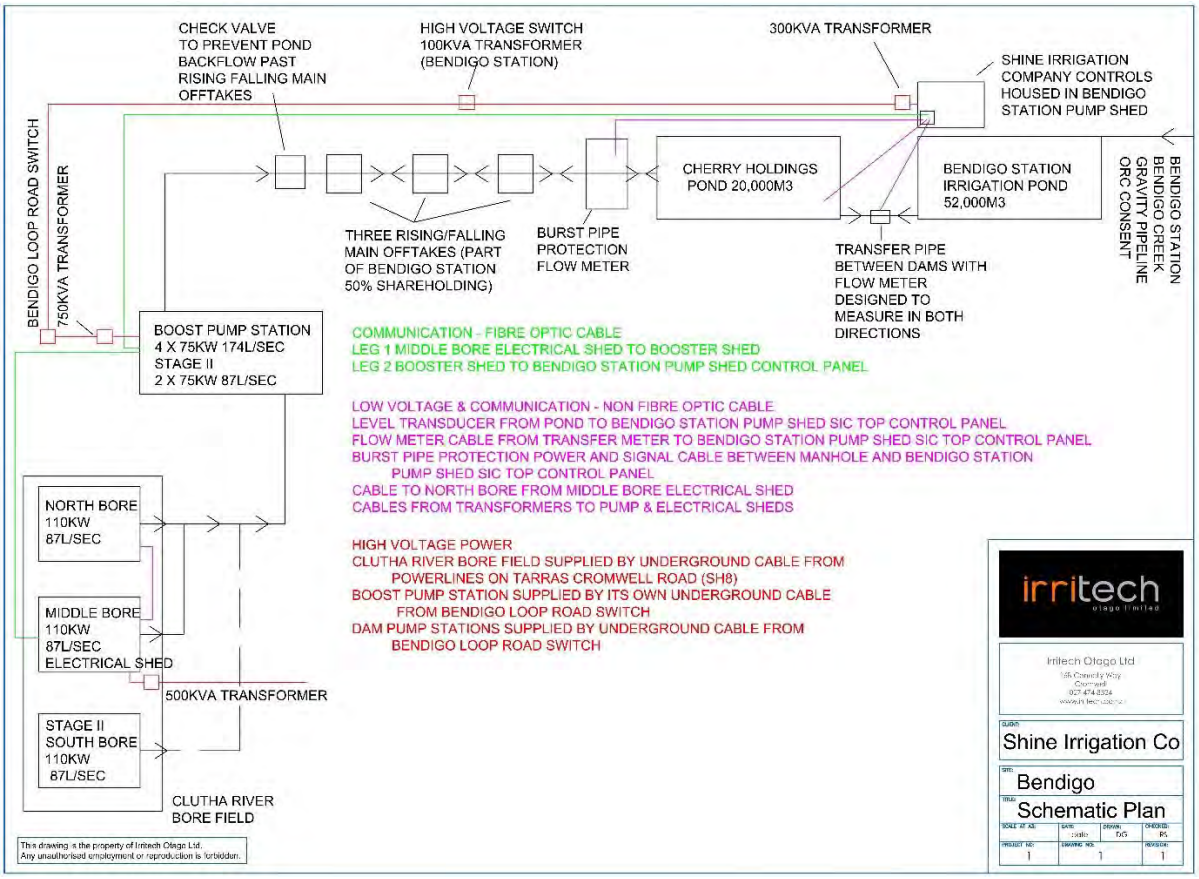


Figure 2: Water infrastructure schematic in relation to the Bendigo and Cherry Holdings ponds

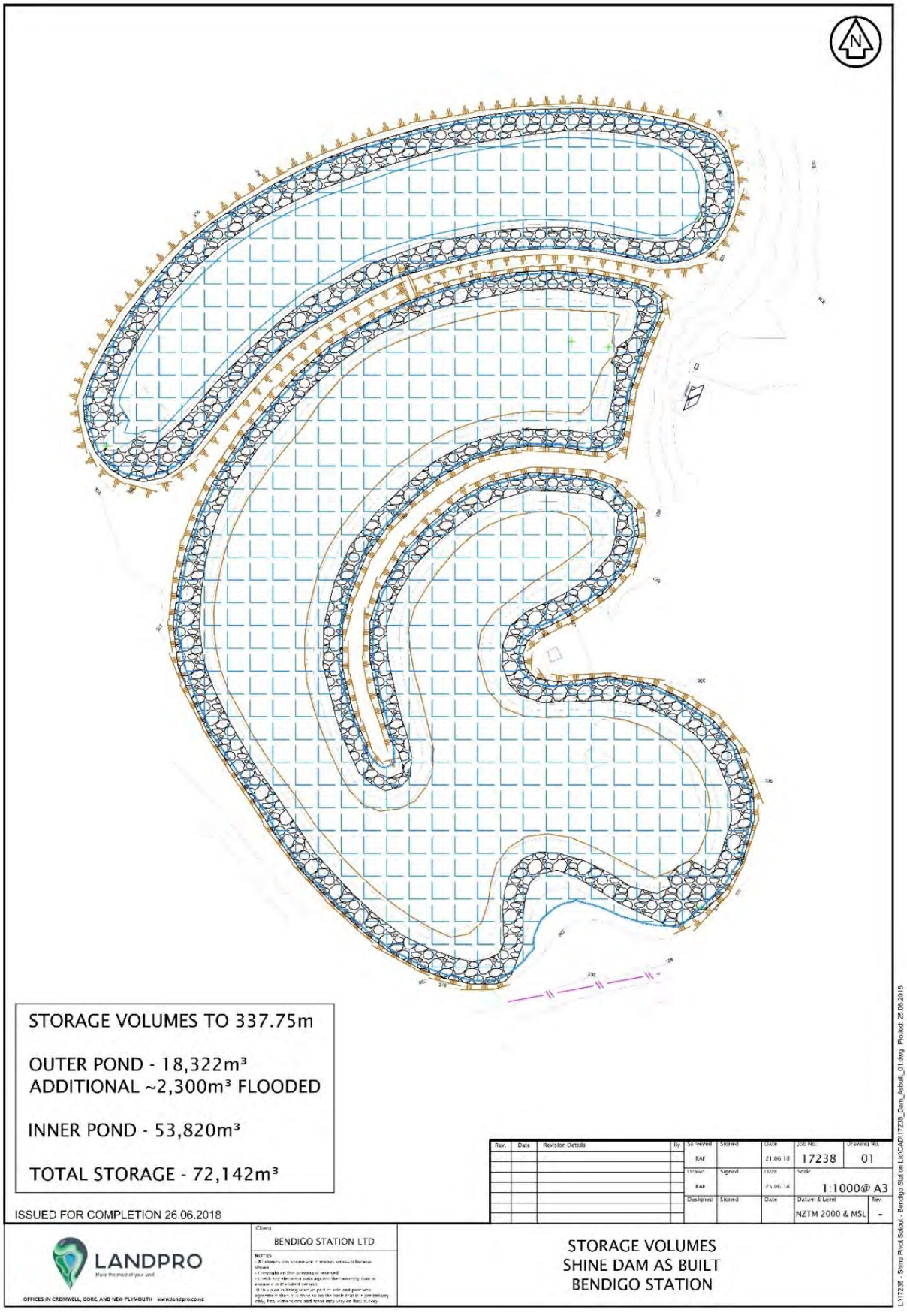


Figure 3: Bendigo Pond (inner pond) & Cherry Holdings Pond (outer pond) as built

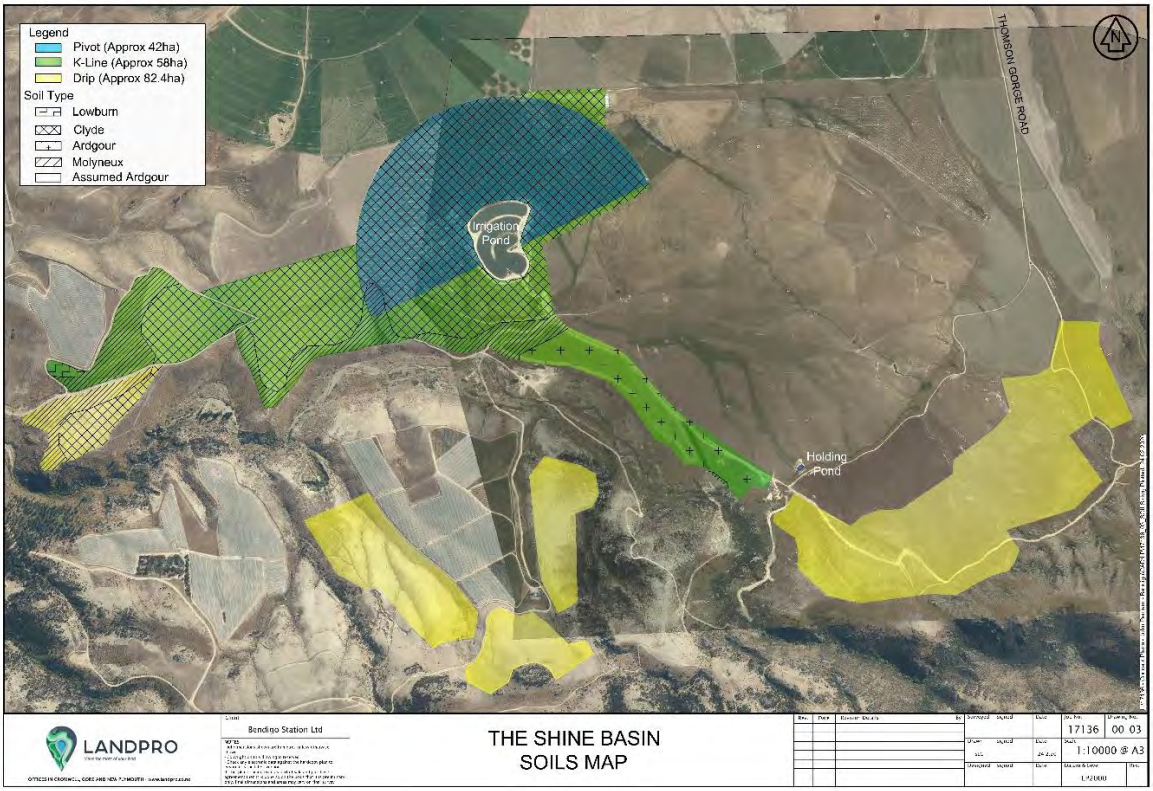


Figure 4: Irrigation areas serviced by water from Bendigo Pond, with blue areas representing pasture irrigated by pivot, green pasture via k-line, and yellow vineyard via drip irrigation

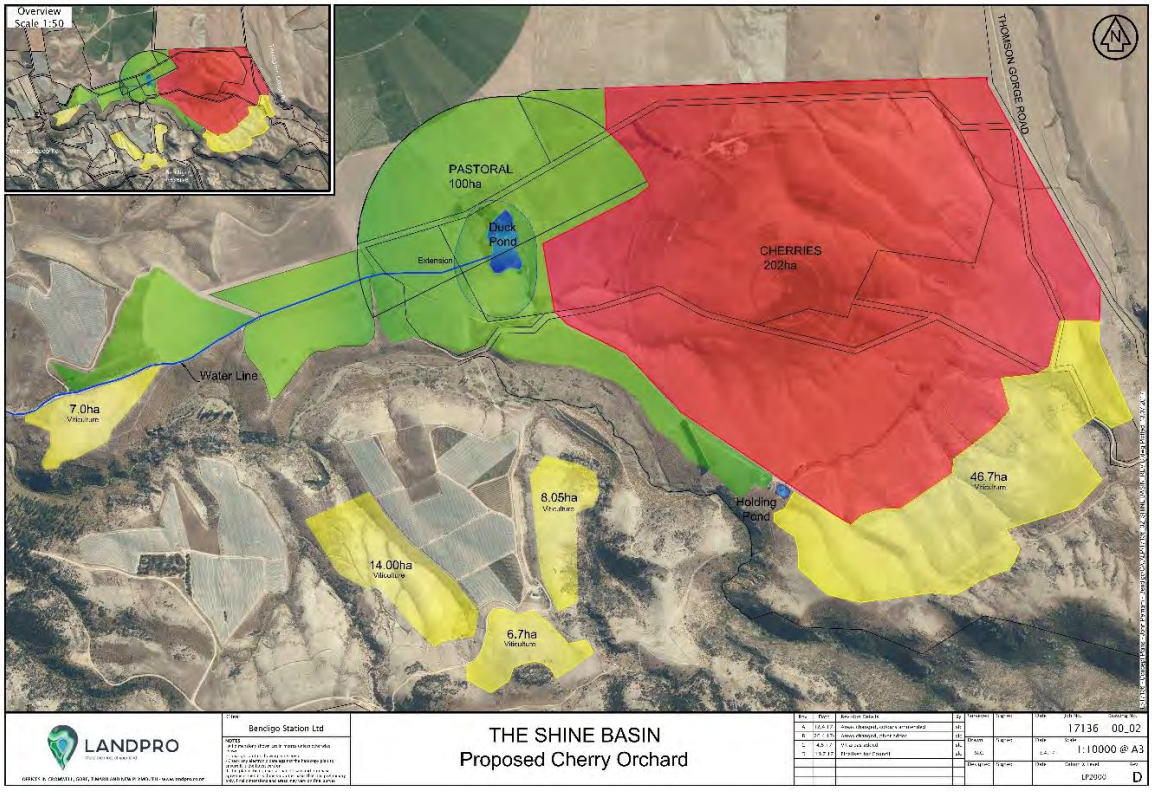


Figure 5: Map prepared prior to upgrade of the duck pond showing existing and proposed areas to be irrigated by both ponds. The green and yellow zones are irrigated with Bendigo Pond water, while the red area (comprising 202 ha of cherries) is irrigated with Cherry Holdings Pond water

2. Bendigo Pond details

As shown in Figure 3, at maximum capacity Bendigo Pond has capacity to hold 53,820 m^3 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^3. 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^3)
- 235,948 m^3/month

- 1,080,568 m^3/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^3. 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^3 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 relevant 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.

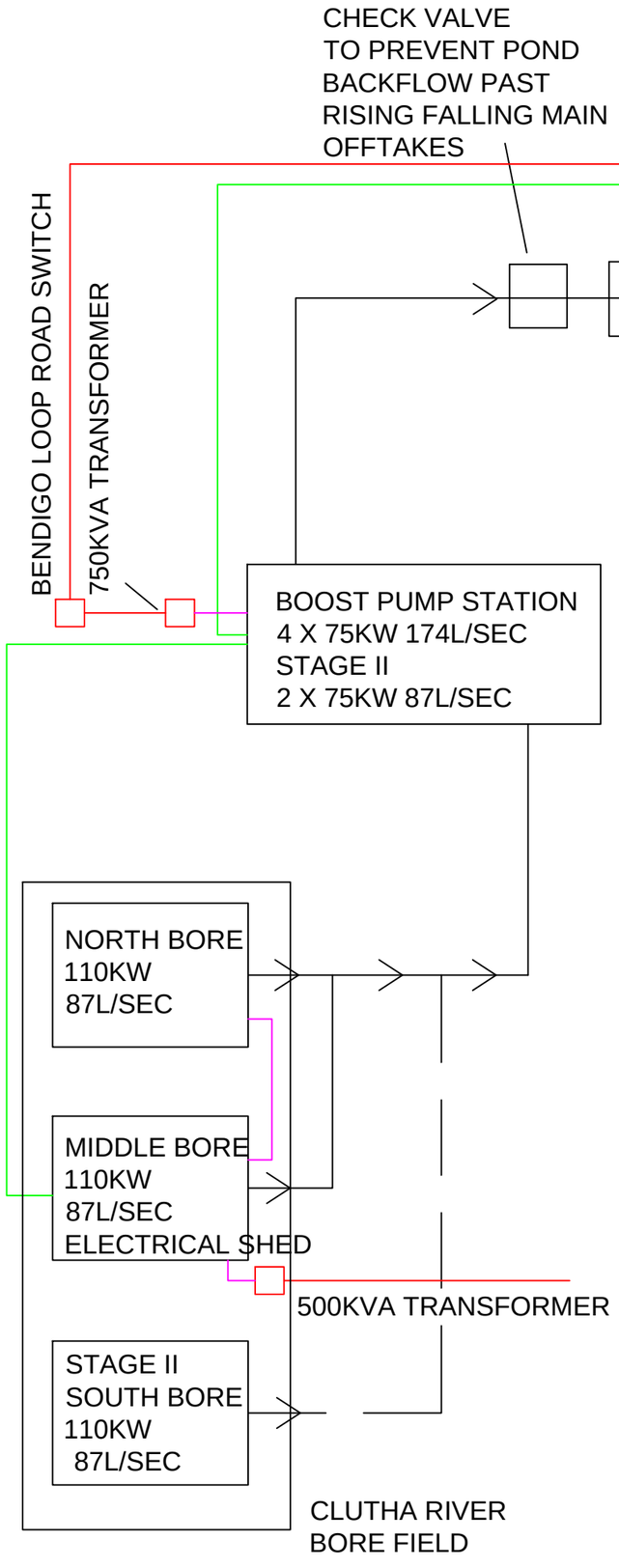
Kind Regards,

Will Nicolson

Scientist/Resource Management Planner

Appendix A – full-size maps and images


Cherry Holdings pond
Bendigo Station irrigation pond
Pond overflow-discharge back to creek
Bendigo Creek
Bendigo Creek monitoring station
Stockwater holding pond
Water meter
Pipeline
WR3908Cr & WR1233Cr take point
Aurora Creek
subject area
Bendigo
N
800 m



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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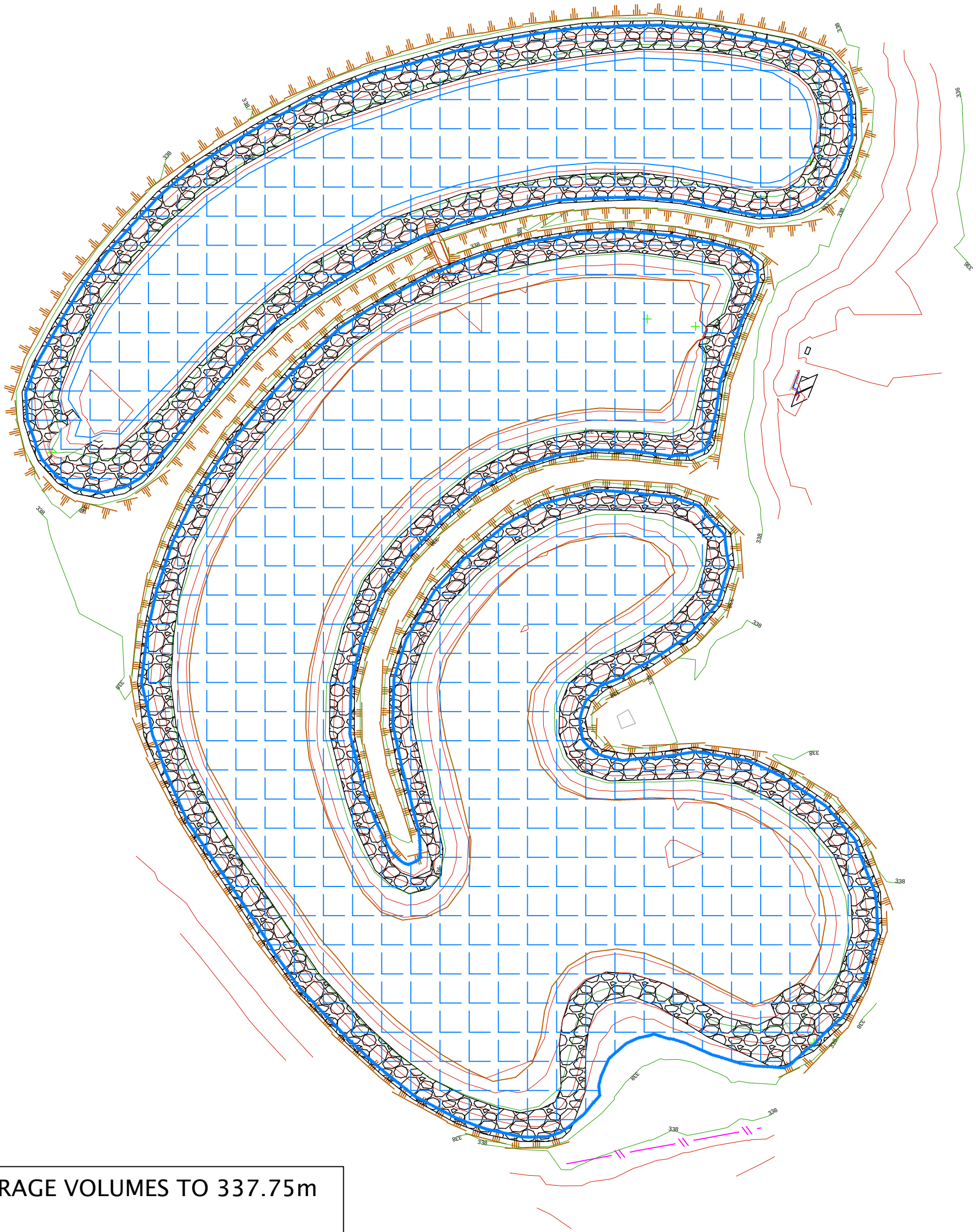
Cromwell
027 474 8324
www.irritech.co.nz

CLIENT: Shine Irrigation Co

SITE: Bendigo

TITLE: Schematic Plan

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



STORAGE VOLUMES TO 337.75m

OUTER POND - 18,322m³
ADDITIONAL ~2,300m³ FLOODED

INNER POND - 53,820m³

TOTAL STORAGE - 72,142m³

ISSUED FOR COMPLETION 26.06.2018

Rev.	Date	Revision Details	By
-	-	-	-

Surveyed	Signed	Date	Job No.	Drawing No.	
RAF		21.06.18	17238	01	
Drawn	Signed	Date	Scale		
RAF		25.06.18	1:1000@ A3		
Designed	Signed	Date	Datum & Level	Rev.	
-		-	NZTM 2000 & MSL	-	

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Client

BENDIGO STATION LTD

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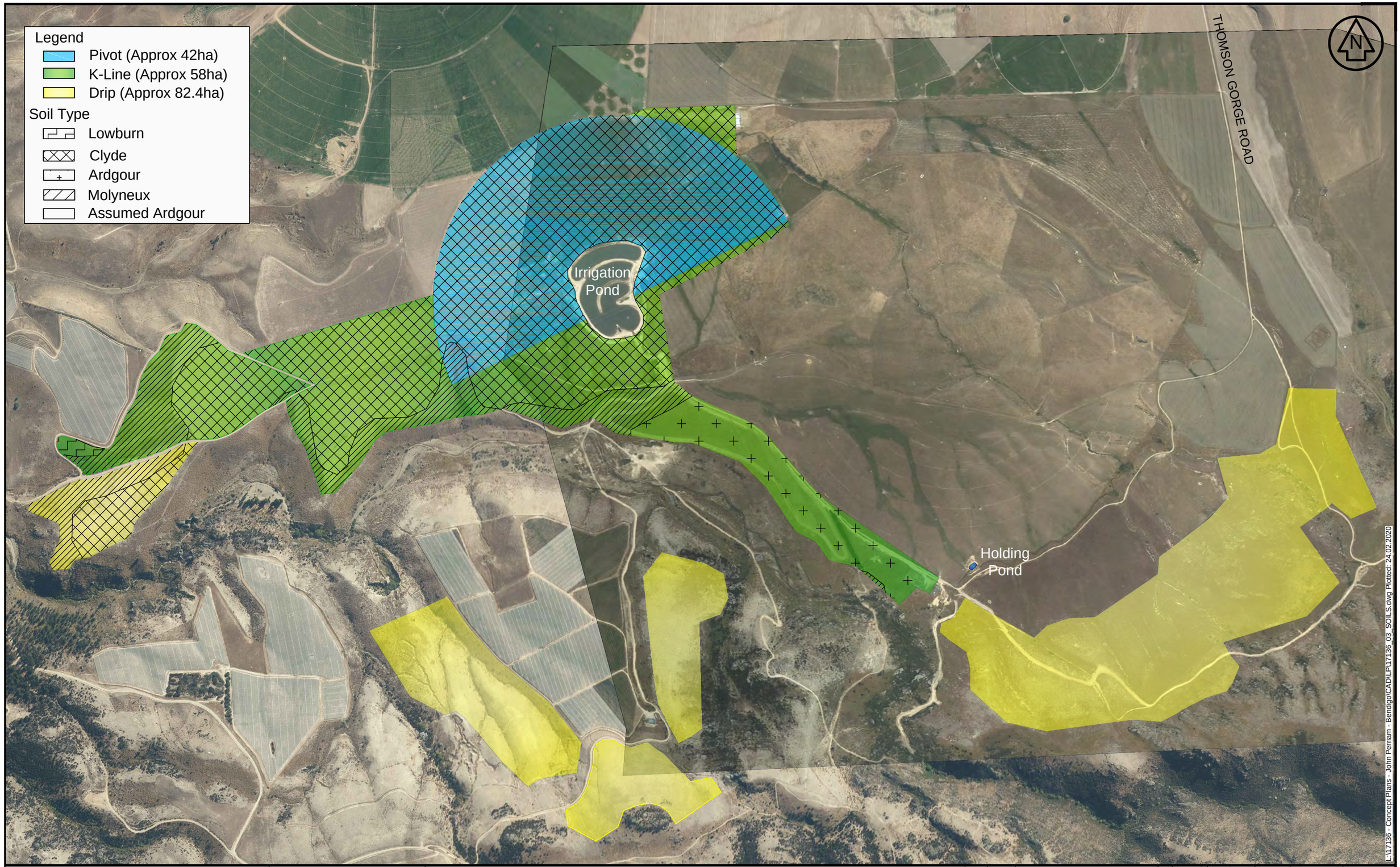
STORAGE VOLUMES
SHINE DAM AS BUILT
BENDIGO STATION

L:\17238 - Shine Pivot Setout - Bendigo Station Ltd\CAD\17238_Dam_Asbuilt_01.dwg Plotted: 25.06.2018



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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		

L:\17136 - Concept Plans - John Perriam - Bendigo\CAD\LP17136_03_SOILS.dwg Plotted: 24.02.2020