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Memorandum

To:	Gavin Kemble	**Of:**	Southdown Holdings
From:	Ian McIndoe	**Date:**	3 August 2009
Subject:	**SOUTHDOWN HOLDINGS LTD PROJECT SUMMARY**		

1 BACKGROUND

(Note: Maps in this summary available in A3 format).

1.1 Property Location

Legal Description: Section 1 SO 327927
Physical Description: Glen Eyrie Downs (and Shelton Downs/Ohau Downs)

PUMP STATION AND INTAKE
Map References: H38:621-522
Legal Description: Sec 3 BLK IV Lake Ohau SD
Physical Description: Ohau Downs

STREAM CROSSING
Map References: H38:617-512
Legal Description: PT RUN 544 669 OHAU LAKE & OHAU RIVER SECS 4-7 PT SECS 1-2 BLK IV OHAU LAKE SD - SECS 5-7 PT SECS 1-2 BLK IV BEING 1185

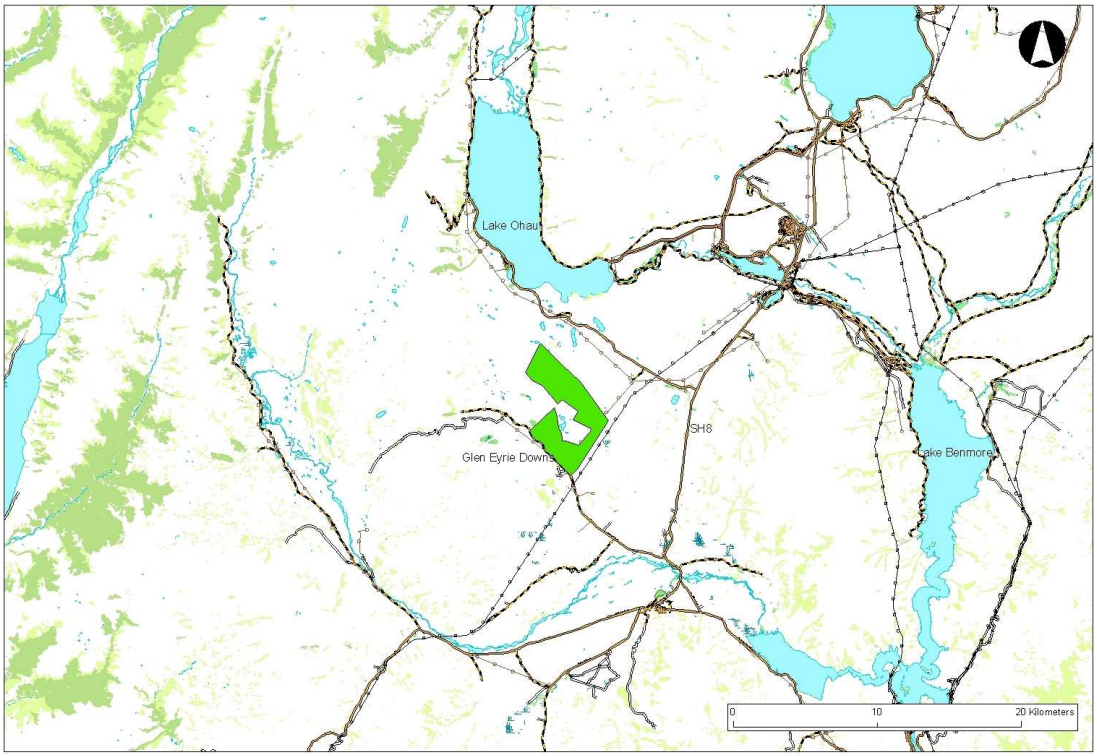

Figure 1: Property location

1.2 Consent Applications

CRC040835: A water permit to take up to 1.2 cubic metres per second of water from Lake Ohau at or about map reference H38:621-522 for spray irrigation of pasture and crops, and for stock water and domestic use.

CRC040836: A land use consent to construct, maintain and operate an irrigation pump station and intake on the shoreline and lake bed of Lake Ohau at or about map reference H38:621-522. And a land use consent to construct and maintain a pipeline underneath Maori Creek at or about map reference H38:617-512.

CRC100224: A discharge permit to discharge up to 560,000 litres per day of diluted dairy effluent onto land by way of spray irrigation.

2 IRRIGATION

Location of irrigated area: Glen Eyrie Downs, located south of Lake Ohau between Quailburn and Lake Ohau Roads. See Figure 1.
Area proposed to be irrigated: 2,068 ha of Glen Eyrie Downs, plus up to 400 ha of Shelton Downs or Ohau Downs.
Proposed land use: Pasture and crops for livestock farming, including dairy/ dairy support.
Irrigation method: Centre-pivots and K-Line. Irrigation design plan presented is draft.

Note: Shelton Downs is not advancing to the hearing until the outstanding landscape matter is resolved with the Waitaki District Council. ECan has been advised of this.

3 WATER TAKE

3.1 General

MIC shares held: 2,068 (plus additional 400 under Shelton Downs)
Source: Lake Ohau
Maximum flow rate taken: 1,200 ℓ/s
System capacity : 0.58 l/s/ha (5 mm/d)
Daily volume: 103,680 m^3/d
Annual volume: 12,408,000 m^3/y for irrigation of 2,068 ha, stockwater and domestic (or 14,808,000 m^3 based on the irrigation of up to 2,468 ha)

4 NUTRIENT MANAGEMENT

Stocking rates: On average 7,000 cows over the 2,068 ha.
Grazing plan: Intent to house cows indoors (cubicle stables) full time for 8 months (March to October) and part time for 4 months (November to February).
Fertilizer plan: Detailed in Ravensdown Nutrient Budget Report dated 18 May 2009.

5 INFRASTRUCTURE DETAILS

5.1 Intake layout and design

Intake type: Infiltration gallery buried beneath Lake Ohau shoreline – either land based or bed mounted.
Screen type and size: Not required.
Pump type: Two stage pumping (submersible/ surface and booster pumps where required), or single stage direct pumping from gallery. The pump station associated with the intake will be buried underground.

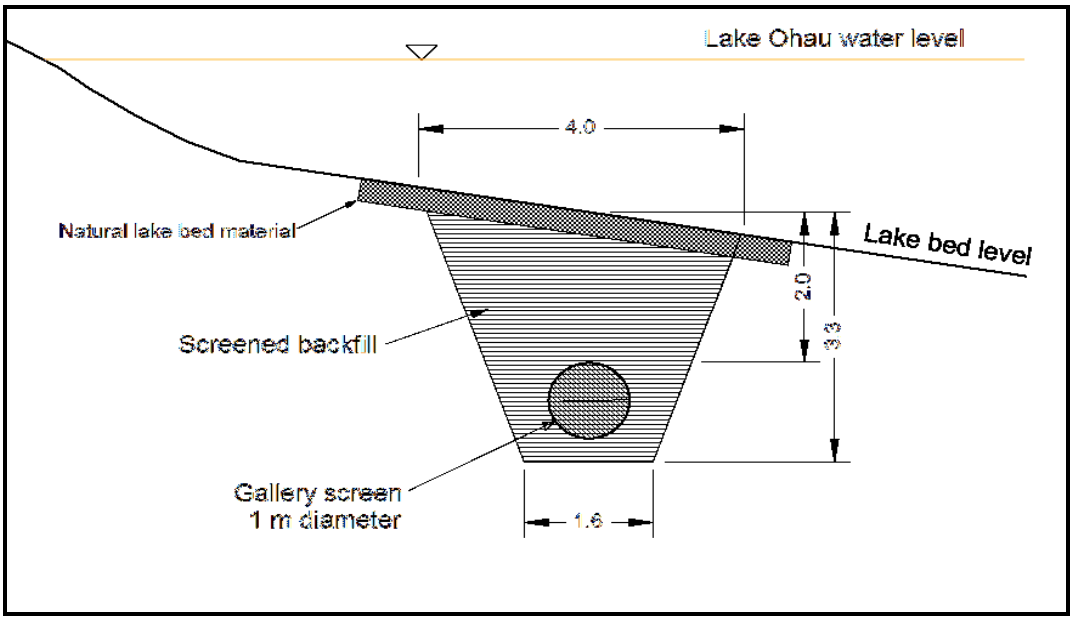

Figure 2: Gallery details

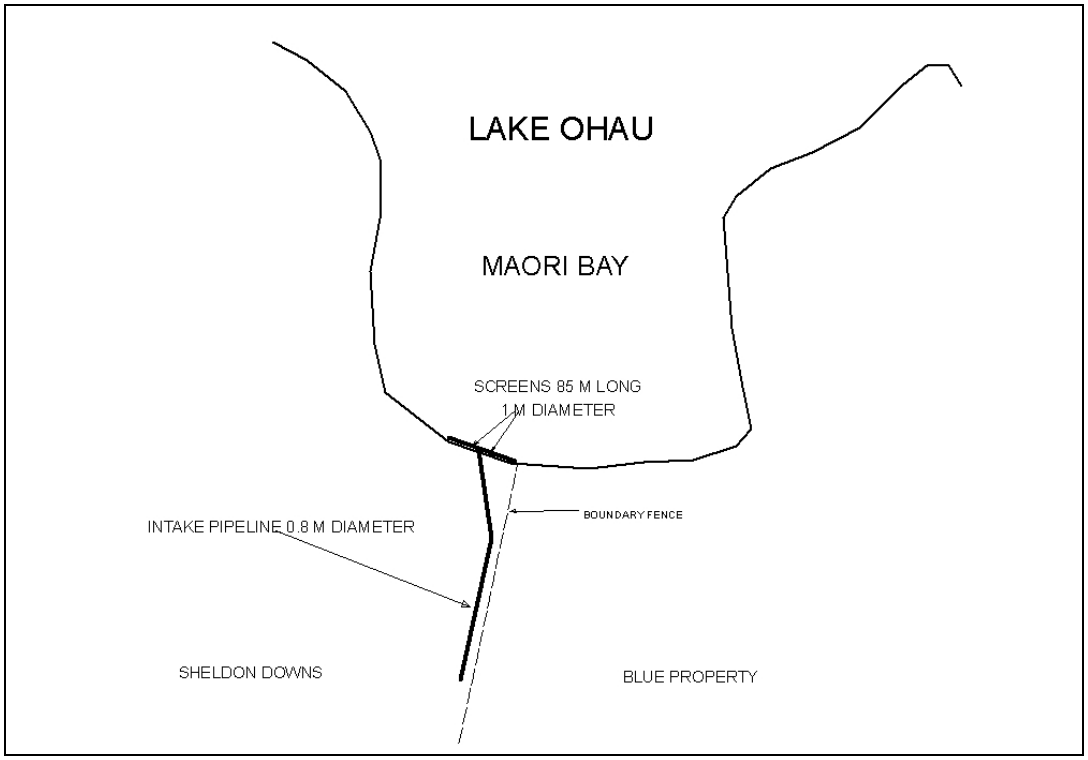

Figure 3: Gallery plan

5.2 Distribution from intake to farm

Pipeline: Buried 900 mm diameter glass reinforced fibre (GRP) pipe, or similar, minimum 600 mm cover.
Road crossings: Lake Ohau Road at or about map reference H39:615-511.
Location: Pipe to be on Shelton Downs boundary land NW of boundary fence for approximately 3.2 km.
Stream crossings: Maori Creek at or about map reference H38:617-512. The 900 mm diameter pipeline will be installed beneath the bed of the creek.

5.3 Irrigation system

5.3.1 Design layout

Irrigators: Proposed 20 centre-pivots (16 full circles, 10 half circles, ranging from 230 m to 650 m long. K-lines in gaps. Refer to Figure 4.
Pipelines: Buried PVC pipe or similar.

5.3.2 Powerlines

Required to supply electricity to pumps and irrigators and other infrastructure. Lines for conveying up to 110kV, lines for conveying telecommunication signals and transformers and substations are all permitted activities under the Waitaki District Plan.

5.3.3 Culverts & bridges

Bridges and/or culverts will be installed where needed where the irrigators cross Wairepo and Serpentine creeks (refer to Figure 5).

5.3.4 Above-ground infrastructure

Other than irrigators and associated equipment, the only water related infrastructure will be a pump station on the shore of Lake Ohau, at the intake location. The pump station associated with the intake will be buried underground.

5.3.5 Irrigation application efficiency

Target: Will be greater than 80% on a seasonal basis over the property.
Actual performance: Irrigation design standards and operational performance will need to result in an application efficiency (exceeding 80%) to achieve target production levels, due to restrictions on irrigation system capacity and seasonal allocation limits.

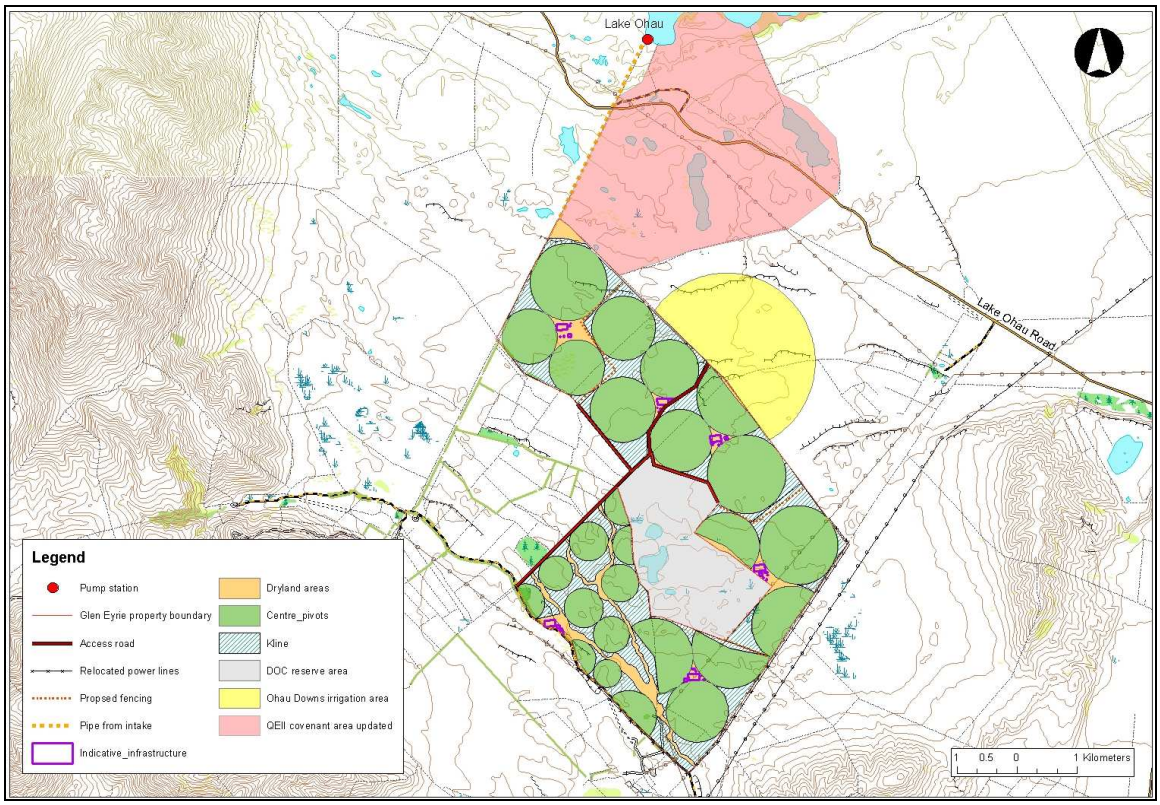

Figure 4: Glen Eyrie Downs proposed farm layout

6 EFFLUENT DISCHARGE

6.1 General

Six separate stand alone dairy units are proposed to be established, each comprising of a total of 7,000 cows.

Cubicle stables: Cows will be housed in two, up to 650 cubicle stables (per dairy unit) for 100 % of the time during the months of March to October, and for 50% of the time during the summer months of November to February.
Days Milking: Cows on each dairy unit will be milked at the property (by robots) for factory supply for up to 300 days of the year.
Effluent produced: Up to a total of approximately 378,000 ℓ of raw effluent will be produced each day. The average total diluted effluent will be approximately 560,000 ℓ/day.

6.2 Storage and discharge

Effluent storage: For each dairy unit, effluent from the stables will be scraped and discharged into a sump, from which the effluent will be separated into liquids and solids using and effluent press. The liquids will be held in a storage pond. The proposed holding capacity of the liquid storage pond on each of the dairy units is approximately 22,000 m^3, which will provide for up to seven months storage. The solids will be stored on a concrete pad.
Effluent discharge: Both the collected solid and liquid effluent will be discharged to the land during the summer months (October to March). The liquid effluent will be applied via centre pivot irrigators, or where the irrigators cross over streams, effluent will be applied to the land using a truck. The effluent will be injected in to the irrigation water at a ratio of approximately 5-10%, prior to it being irrigated onto the land.
Buffers to streams: The effluent will not be applied at a rate that exceeds the rate of plant uptake of nitrogen within the discharge area, within 20m of any bore, soakhole, surface waterbody or artificial watercourse, in any location where it may run-off and enter ground or surface water, or on frozen or snow-covered ground.

7 LAND USE

7.1 Areas of vegetation to be removed

Natural vegetation: Unimproved grasses, sweet briar, hieracium, wilding pines.
Proposed cultivation: The land (2,068 ha) has been cultivated, and is currently used for dryland pasture and crop production.

7.2 Setbacks from waterways

7.2.1 Six Mile Creek

Location: Six Mile Creek runs across approximately 480 m of the top north east corner of the property. It is a tributary of Wairepo Creek (Figure 5).
Flow: Generally flowing. A southern branch shown on some maps is dry.
Setback from irrigation area: A 5m riparian setback is proposed. Permanent fencing will also be established where stock may be present adjacent to the waterway (refer to Figure 6). No irrigation on north side of creek. Irrigators will not cross over Six Mile Creek or its tributaries.

7.2.2 Wairepo Creek

Location: Approximately 1,300 m of stream crosses the centre of the property between the DoC reserve and Ohau Downs (Figure 5).
Flow: Generally flowing.
Setback from irrigation: Final irrigation layout to be adjusted to avoid stream crossings as much as possible. A 5m riparian setback is proposed (refer to Figure 6). Permanent fencing will also be established where stock may be present adjacent to the waterway. Current irrigation plan shows one pivot will cross Wairepo Creek. Bridges are therefore to be installed at irrigator wheel paths. Fertiliser and effluent and will not be applied in the irrigated water where the irrigator passes over the creek.

7.2.3 Serpentine Creek:

Location: Two main branches flow across the south-eastern corner of property for approximately 4.5 km (Figure 5).
Flow: Generally flowing.
Setback from irrigation: Final irrigation layout to be adjusted to avoid stream crossings as much as possible. A 5m riparian setback is proposed (refer to Figure 6). Permanent fencing will also be established where stock may be present adjacent to the waterway. Two pivots will irrigate over minor branches of the Serpentine Creek. Fertiliser and effluent will not be applied in the irrigated water where the irrigator passes over the creek.

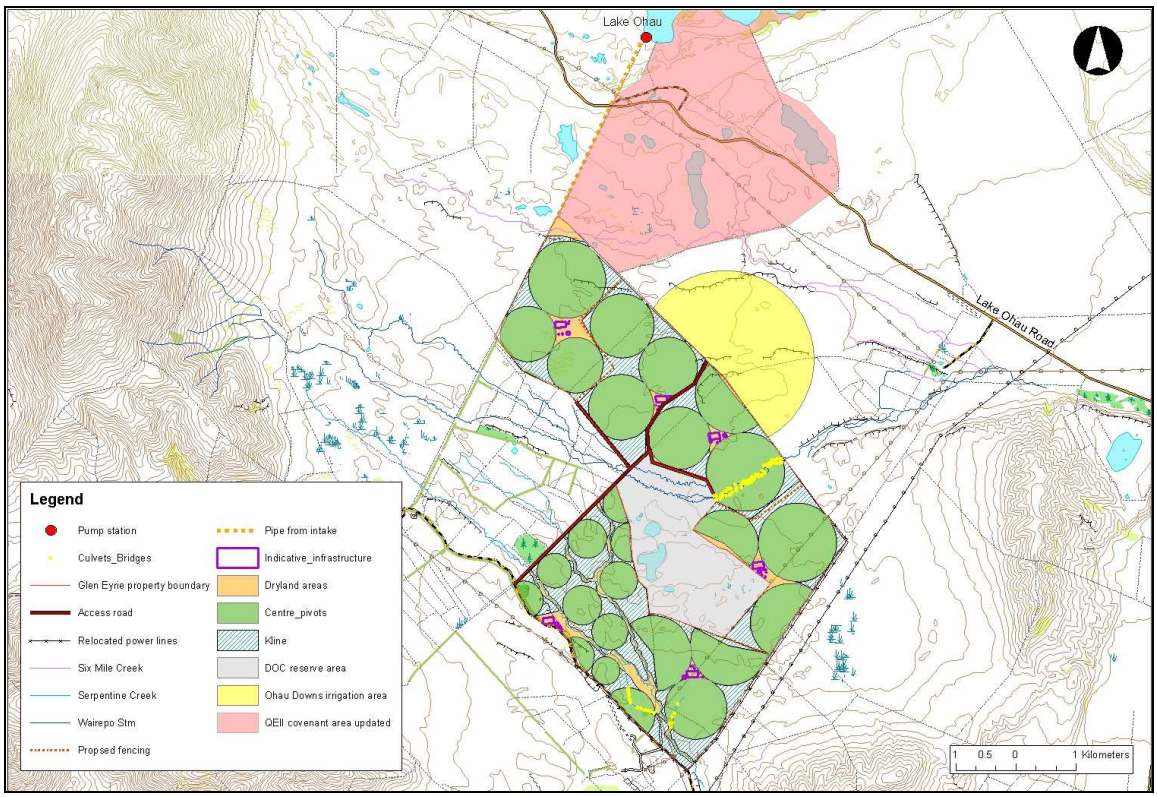

Figure 5: Waterways within irrigation area and indicative infrastructure

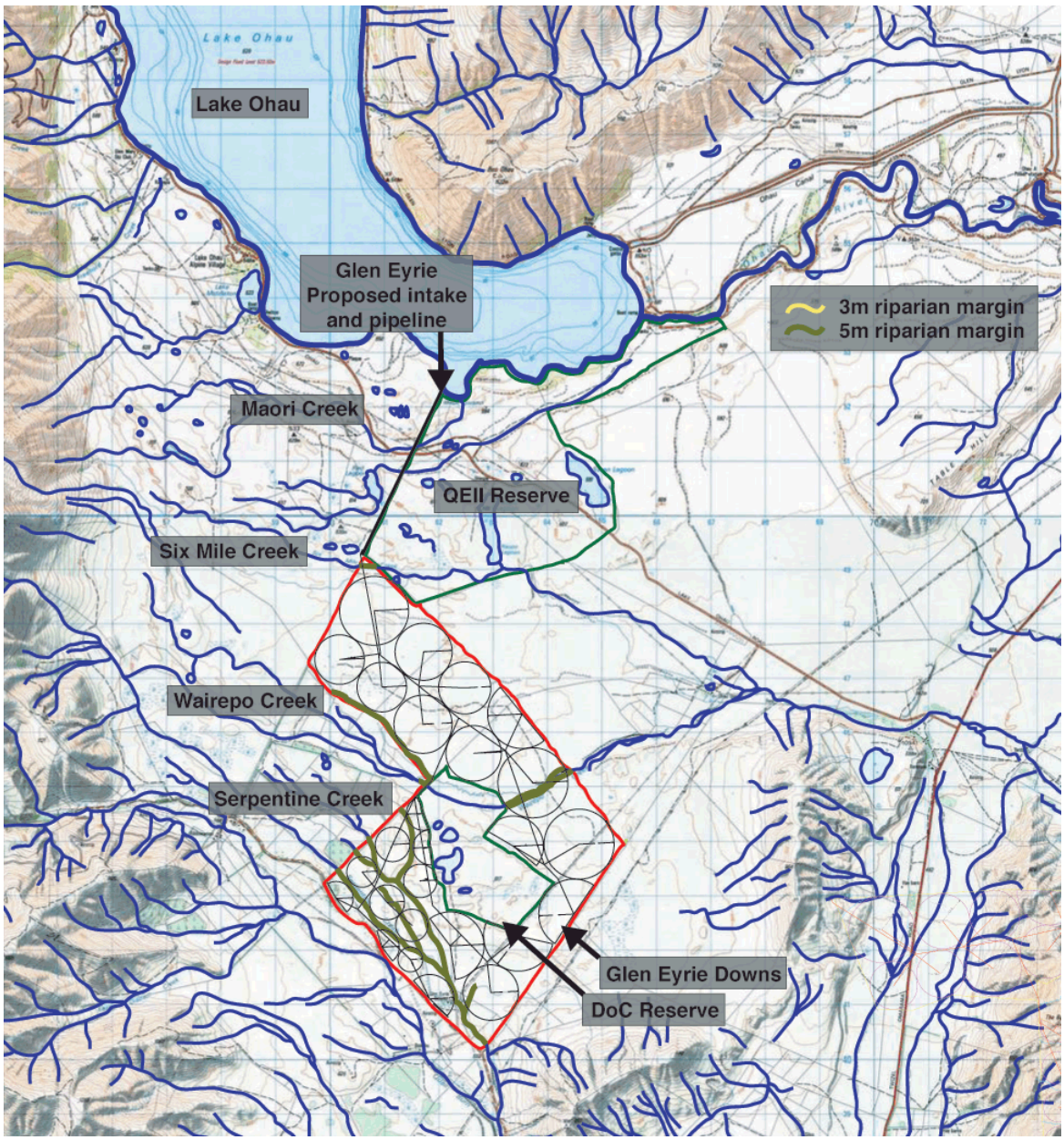

Figure 6: Indicative fenced riparian margin distances around waterways