QLDC Council Workshop

Project: Shotover Disposal Field Project (001314)

Date: Tuesday 29th April 2025

Presented By: Andrew Hill

QUEENSTOWN LAKES DISTRICT COUNCIL

Purpose/Desired Outcome

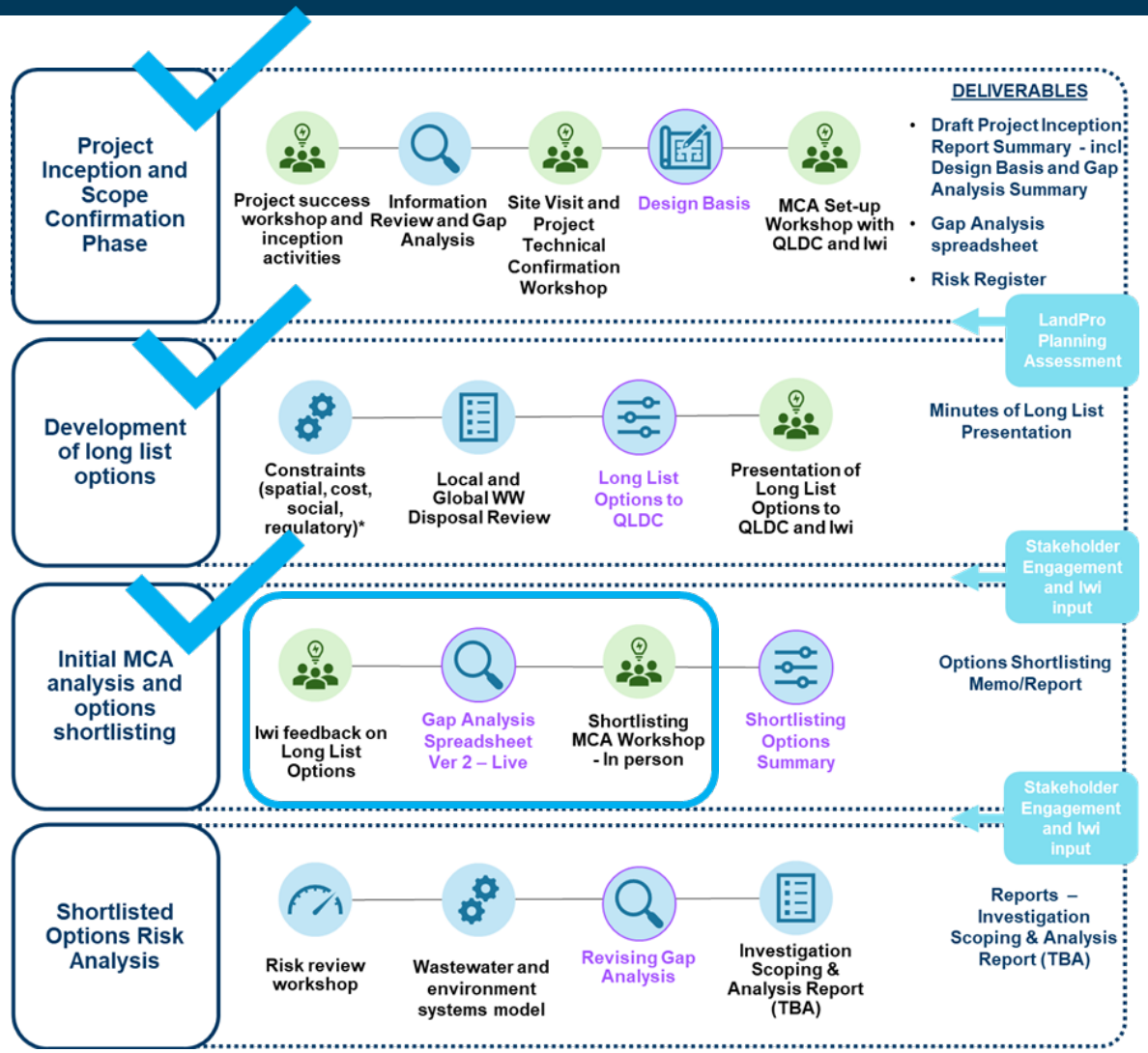
QUEENSTOWN LAKES DISTRICT COUNCIL

- Briefing for Information and Q&A/Feedback.

Background - Summary

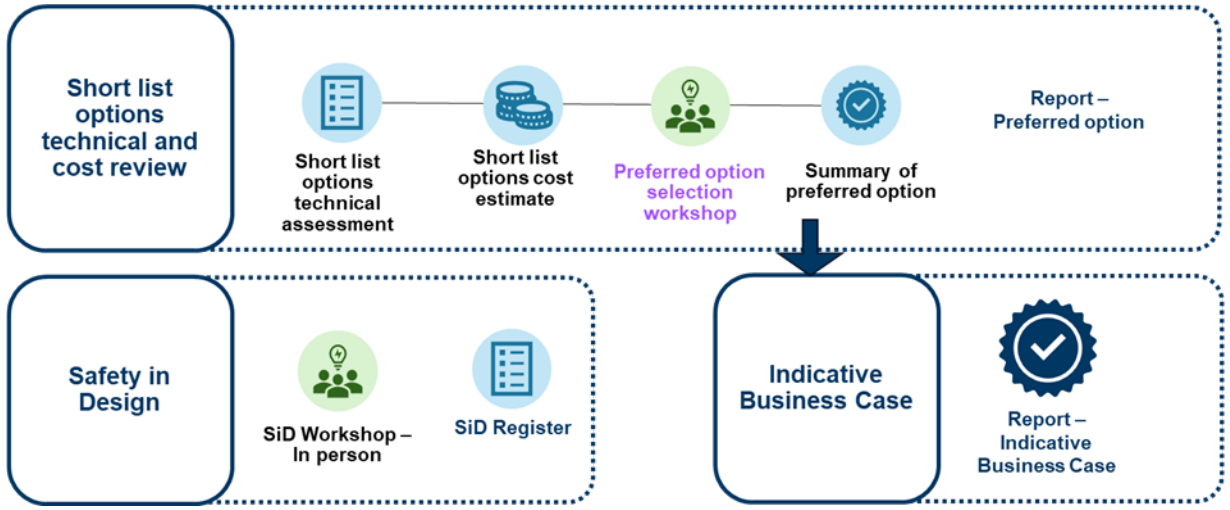
- Project Deliverables: Design, consent, construct & commission a new Waste-Water Disposal Solution for the Shotover WWTP.
- Additional filtration from the WWTP is likely on all options.
- Project Benefits:
  - Gain and comply with new resource consent (target 35 yrs).
- Design horizon: 2060 (35 years from 2025).
  - Updated growth and waste projections are imminent (2025)
- Required to meet milestones as follows:
  - Resource Consent Application – May 2026
  - Engineering Design Completed – Dec 2027
  - Disposal System implemented – Dec 2030

Project Assessment



Current Status (1st Apr):

Draft Short List has been created from the Long List Options Workshop on 13th Mar 2025, finalisation of scoring is in progress, but not expected to change the short listed options.



Supplementary Information on Long List Options

The following section outlines the long list options that have been developed through workshops with partners and stakeholders and considered via an MCA process to achieve a short list of options.

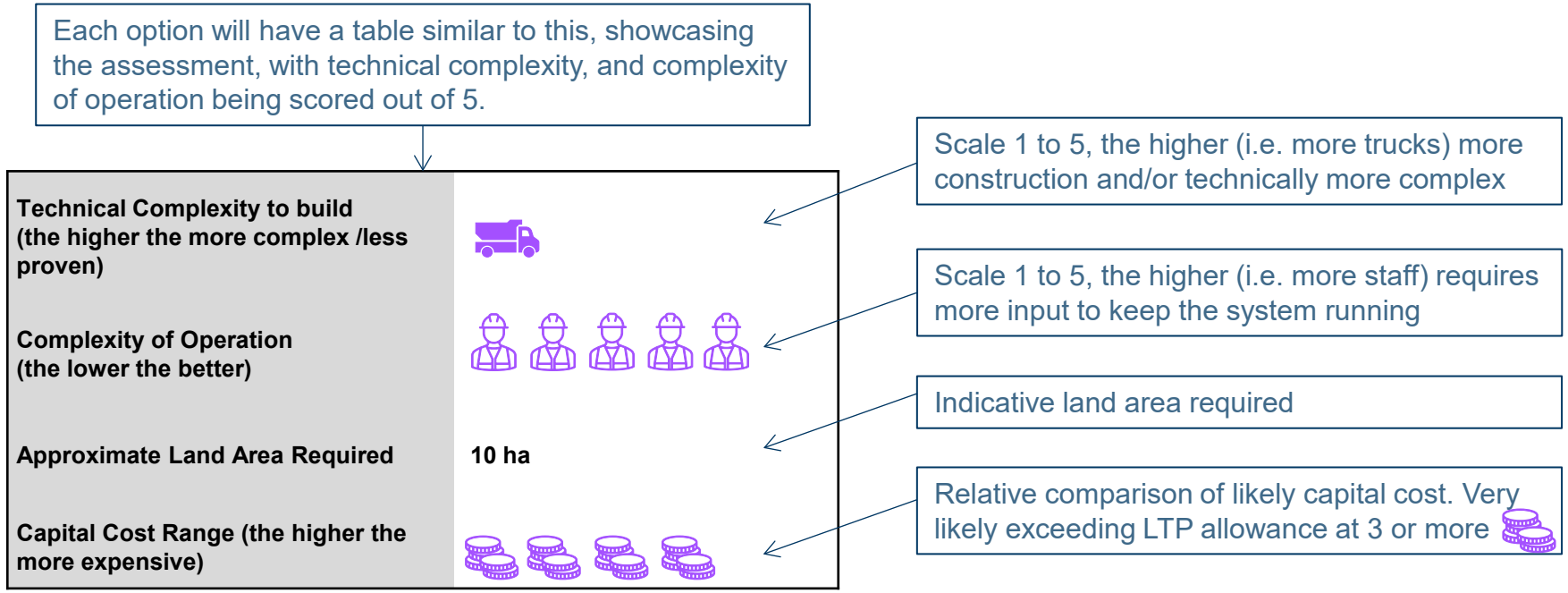
*Note, all options are likely to include some form of additional filtration at the existing WWTP – this will be considered as part of the Disposal Field Project. The final level of filtration and design will be based on the preferred option chosen.

Options Preliminary Assessment - Key

This is an initial development of the options, including a high-level assessment to provide information to support the MCA scoring. These will be refined and incorporated into a more detailed assessment for Short List scoring and Preferred Option selection. The cultural aspects of each option have been assessed by the iwi partners in this project (Aukaha and Te Ao Mārama Inc), with support from GHD and QLDC. Final assessment of Options 7a and 8a are currently being confirmed by iwi partners, but were supported to progress to Short List at selection workshop.

The current assessment of each option for technical complexity and complexity of operation is scored out of 5 and is for option comparison purposes only. Additionally, the land area required is an indicative estimation. An example of the assessment scoring is provided below.

The cost ranges provided in this pack and for the shortlist assessment are indicative and not based on detailed development of the options or designs at this stage. Coin 'piles' signify approx. $40M each, so where the options have 3 or above , this is likely to exceed the current LTP of $77.5 million. Purple reflects Construction cost, red reflects potential land costs.



Option 1 – High-rate land disposal

Overview

High-rate application of treated wastewater to land, via open basins (option 1a) or closed trenches (option 1b).

Designed to allow rapid soakage of treated wastewater.

Multiple disposal areas used to allow 'resting' for a period between applications.

The land area required is dependent upon:

1) Soil infiltration capacity
2) Groundwater levels
3) Aquifer capacity to disperse treated wastewater

Shotover River delta capacity is limited by the aquifer capacity, which is estimated at approximately 5,000 m^3/day.

Capacity can be significantly improved by :

1) Building up the ground surface with open gravel
2) Excavating existing ground and replacing with more open gravel

Image refers to the open basin's scenario (option 1a)

Option 1 a)
High-rate land disposal - Infiltration basins at Shotover Delta

Description

High rate infiltration open basins will be constructed on the Shotover Delta for disposal of treated effluent.

Treatment improvements include tertiary filtration.

The 10ha disposal area will raise by 3 metres to avoid ponding.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	**10 ha**
Capital Cost Range (the higher the more expensive)	

+

- Close to WWTP and existing infrastructure
- Utilise QLDC owned land
- Area has already seen significant disturbance
- Provides for some limited in-ground treatment

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- Infiltration to ground limited by shallow groundwater table and aquifer capacity to disperse
- Raising ground surface with open gravel 2-3 m required to increase capacity (likely >30,000 m^3 cobbles)
- Significant change to the Kawarau River bank and recreational access
- Minor seepages to the Kawarau River from the gravel bank may be visible
- Renewal of gravel likely needed with progressive siltation and flood damage.
- Without earthworks, would only form part of a mixed solution

Option 1 b)
High-rate land disposal - Infiltration trenches at Shotover Delta

Description

High rate infiltration disposal of treated wastewater on the Shotover Delta via trenches.

Tertiary filtration will provide improved effluent quality before the disposal trenches in a 25 ha area.

The existing flood protection training line will need to be relocated.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	**25 ha**
Capital Cost Range (the higher the more expensive)	

+
- Close to WWTP and existing infrastructure.
- Utilise QLDC owned land
- Area has already seen significant disturbance

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- Infiltration to ground limited by shallow groundwater table
- Raising of ground surface by approximately 2 m with gravel to provide surface for trenches and aquifer capacity
- Significant change to delta, Kawarau riverbank and recreational use
- Realignment of flood protection embankment to protect delta and infrastructure
- Renewal of gravel likely needed with progressive siltation and flood damage
- Without significant earthworks, would only form part of a mixed solution

Option 2 – Moderate rate land disposal

Overview

Moderate rate application of treated wastewater to land.

Sub-surface discharge, such as by evenly spaced, shallow trenches, avoids potential contact and spray drift.

Application rates avoid prolonged saturation of soils and so need shorter resting periods than high-rate schemes.

Transpiration and nutrient uptake by vegetation is often relied upon to reduce soil saturation and avoid excessive nutrient leaching.

The land area required is significantly greater than high-rate disposal schemes and determined by:

1) Soil infiltration capacity
2) Depth to low permeability layers
3) Groundwater levels
4) Topography
5) Buffer distances from wetlands and streams

Option 2 a)
Moderate rate land disposal to Airport and surrounding area

Description

Moderate disposal trenches will be constructed in the area in the vicinity of the airport and surrounding area. UV treated effluent is lifted to the Frankton area for dispersal into trenches spreading across a total area of 70 to 90 hectares.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	**70 - 90 ha**
Capital Cost Range (the higher the more expensive)	

*Access to site during construction and cost of land was not considered.

- Sufficient land open land area
- Significant depth to groundwater table (>40 m), groundwater mounding not an issue
- Potential to increase trench network with future population increase
- Current public access and use is limited to only small parts of the larger area

- Require pumping from WWTP to various disposal zones.
- Some areas might already earmarked for future development, potential land use conflicts
- Construction activities impacted by current land-use and aviation operations
- Access for maintenance will be impacted by aviation operations
- Land purchase likely required and could significant increase project cost (shown as green coins)

Note: The estimated area required is indicative only. Not all the selected land is owned by Queenstown Airport.

Option 2 b)
Moderate rate land disposal at Southern Corridor

Description

Similar to Option 2a, moderate disposal trenches will instead be located in the area within the Southern Corridor.
UV treated effluent is lifted to the Southern Corridor area for dispersal into trenches spreading across a total area of 70 to 90 hectares.

- Potential to increase trench network with future population increase
- Readily accessible for maintenance.
- Addresses southern development wastewater conveyance needs as secondary outcome
- Potential for areas of public use of land not currently accessible
- This land is owned by QEII Trust as it was gifted by the Jardine family, and it is not for housing development.

- Requires pumping from WWTP
- Requires crossing over Kawarau River
- Land access agreement/ purchase may be required, (as shown in red coin)
- Area required for sole solution 70-90 ha. Although due to presence of glacial till, may only be suitable land for part solution.
- Potential for shallow groundwater (<2 m in places) and close proximity of streams means larger land parcel may be required

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	**70 - 90 ha**
Capital Cost Range (the higher the more expensive)	

*Cost of land was not considered.

Option 2 c)
Moderate rate land disposal alternate locations across the Shotover or Kawarau

Description

Infiltration trenches at alternate locations across the Shotover or Kawarau River e.g. Bridesdale Flats, provide broad coverage and moderate rates of infiltration.

A number of dispersed locations would likely be required to provide a complete solution, resulting in more complex operation and monitoring.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	**70 - 90 ha**
Capital Cost Range (the higher the more expensive)	

*Cost of land was not considered.

- Potential to increase trench network with future population increase
- Readily accessible for maintenance
- Potential for areas of public use of land not currently accessible
- Conveyance infrastructure, such as foot/cycle bridges, may support broader recreational use of the Kawarau River area.

- Requires conveyance and pumping from WWTP
- Land access agreement/ purchase may be required
- Area required for sole solution 70-90 ha*, likely requiring disconnected land parcels to meet capacity
- Additional infrastructure and maintenance costs associated with multiple disposal locations
- Requires crossing over Shotover River and/or the Kawarau River
- The Ladies Mile land, above Shotover Country, is subjected of recent re-zoning for 2400 houses so potential land use conflicts.

Option 3 – Low rate land disposal

Overview

Treated wastewater disposal by irrigation to land at low rates (a few mm/day), over large areas.

Often aligned with ongoing use of the land for plantation forestry, pasture or beneficial revegetation.

Provides in-ground treatment for nutrients and contaminants.

Typically used where medium rate disposal options are not appropriate.

In appropriate areas where reliable soakage to ground is achieved, irrigation can be year-round.

In areas where soakage to ground is limited due to weather conditions, irrigation is typically undertaken seasonally and dictated by soil moisture (deficit irrigation)

The land area required is determined by:

1) Soil infiltration capacity
2) Slope
3) Sensitivity of the surrounding environment

Estimated that approximately 400 – 500 ha of land would be required

Example: Sub-surface Drip Irrigation

Option 3 a)
Low rate land disposal irrigation to Doc land and/or Coronet Peak

Description

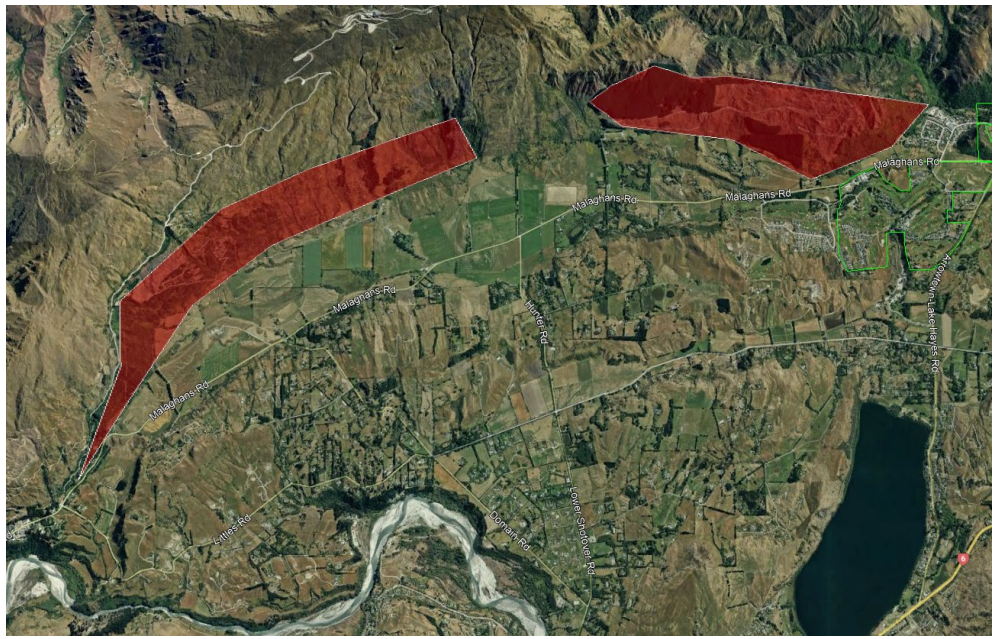
Project Tohu site covers 200 ha on the south facing slopes of Coronet Peak close to Arrowtown and rises to its highest point of 930m. Project Tohu will plant over 500,000 indigenous species of grasses, scrubs and trees. And in the future recreational (biking, walking and horse riding) areas will be available at the site for the community to enjoy. Irrigation to this area, and an additional 300 ha of ridge slope adjacent to Coronet Peak Rd, would provide the approximated area required for low rate irrigation of future wastewater flows.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	**400 - 500 ha**
Capital Cost Range (the higher the more expensive)	

*Cost of land was not considered.

- Beneficial use, support planting initiatives

- Seasonal use only, particularly in south facing areas where extended frost conditions prevail in winter
- Very low-rate application only due to steep topography and limited soil depth over bedrock.
- Would require alternate disposal solution or storage for significant periods of the year.
- Significant infrastructure and operational costs (approx. 7 km of pipework), pumping requirements, irrigation network and maintenance.
- Potential for preferential flow paths and run-off to surface water (streams) and land stability issues.
- Permission to use land is unknown



Option 4 – Land flow path to river

Overview

Of various scales and designs from discrete rock channels to engineered amenity features.

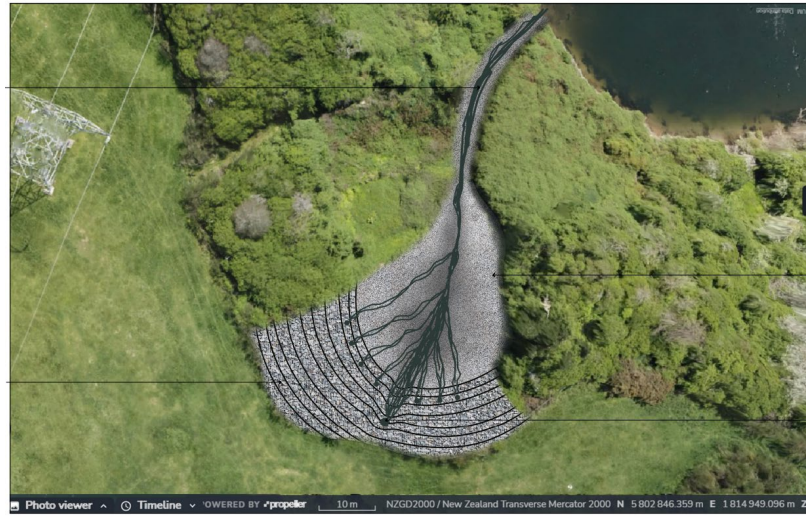
Large scale, subsurface flow paths, engineered with local rock to provide a naturalised means of directing stormwater and treated wastewater to the environment.

Land flow paths provide connection of treated water with the ground and use the topography and land features of the surroundings.

Designed for amenity and cultural value with community and Iwi contribution. Designs typically include consideration of aesthetics, cultural identity and values.

Often used beneficially to provide river-bank erosion protection and can be designed to accommodate all flow conditions.

Provide a reliable low cost means of returning water to the environment.



Option 4 a)
Land flow path to river – Shotover River

Description

Long land flow paths (> 250 m) to the Shotover River. These repurpose historical channels used for wastewater disposal and their connection to the River. Modified to provide a subsurface flow path, including infilling with rock.

Development of a rock discharge area at the river bank, to minimise contact, protect against erosion and disperse flow into the river.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	Small and can be sized to suit
Capital Cost Range (the higher the more expensive)	

- Close to WWTP and existing infrastructure.
- Utilise QLDC owned land
- Potential to be used as sole or as a mixed solution option
- River mixing locations are not readily accessible
- Repurposing historical engineered channels minimises disruption to area and recreational land use
- Cost effective and low maintenance

- Susceptible to sedimentation and clogging from floods.
- Management and exclusion of public access to parts of Shotover River
- Minimal in-ground treatment
- Potential for treated wastewater migration with groundwater away from the channel/s and contribute to ponding on delta

Option 4 b)
Land flow path to river – Kawarau

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	Small and can be sized to suit
Capital Cost Range (the higher the more expensive)	

Description

Broad and long (>100 m) land flow paths constructed in natural depressions and former river channels on Shotover Delta. These engineered flow paths across delta would merge with the Kawarau River providing the means for flow to disperse into the river. Sufficient thickness of rock to accommodate flood flows. Public access over and around rock features.

- Close to WWTP and existing infrastructure.
- Utilise QLDC owned land
- Potential to be used as sole or mixed solution option
- River mixing locations are not commonly used
- Uses natural delta environment and the historical river channels for flow
- Cost effective

- Susceptible to sedimentation and clogging from floods.
- Management and exclusion of public access to parts of Delta
- Renewal of rock likely to be needed in places following future flood events.
- Minimal in-ground treatment

Option 5 – Deep well injections

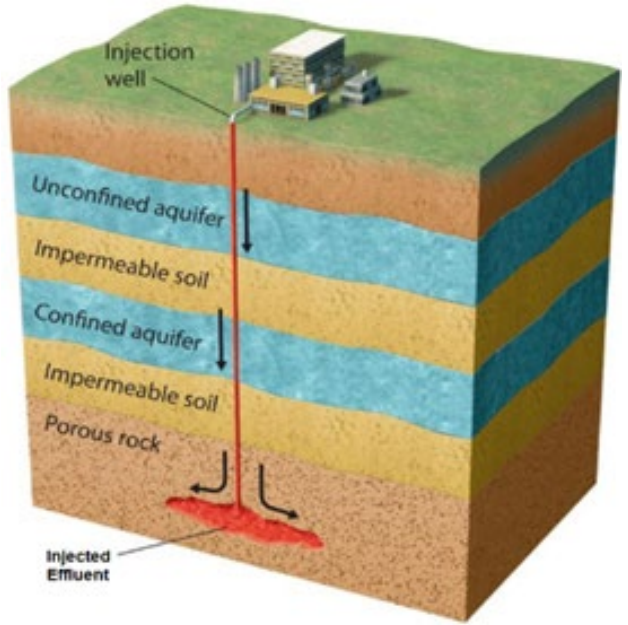
Overview

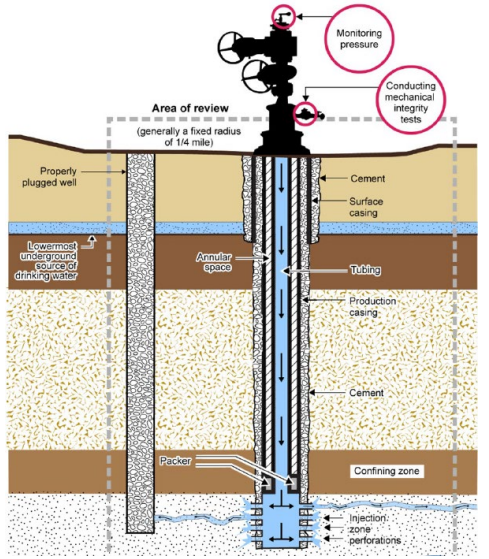
Disposal of treated wastewater via injection into the ground and aquifers, for in ground treatment and dispersion.

Used internationally as a means of returning stormwater and wastewater to the environment, or to increase recharge of heavily used aquifers.

Typically targeting confined aquifers at depth that are not used for water supply and within known flow paths.

Bores are large diameter (typically >0.3 m) and may be pressurised to promote discharge.





Option 5 a)
Deep well injections at Frankton

Description

Discharge of treated wastewater via deep injection wells on Frankton Flats. Estimate 4 bores required (2 in use and 2 resting).

Tertiary filtration will be added to provide additional solids removal.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	Discreet points across the area
Capital Cost Range (the higher the more expensive)	No land purchase assumed

*Access to site during construction and cost of land was not considered.

- Potential for use as a sole or mixed solution
- Year round disposal capacity (no seasonal constraints)
- Suitable geology (permeable gravels) with deep groundwater table(>40 m)
- Additional filtration through gravel aquifer before ultimately flowing to Kawarau catchment
- Groundwater not utilised for public water supply on this side of Shotover River
- Possibly fit within QLDC owned land (pending investigations)

- Land access agreement (lease) will be required (if needed)
- Sensitive to the quality of injection water with potential for clogging
- Routine maintenance /resting required
- Maintenance would need to be undertaken by specialist contractors
- Flow rate management to reduce risk of mounding and generation of river bank springs
- May cause land instability
- Requires pumping from WWTP

Option 5 b)
Deep well injections at Bridesdale

Description

Tertiary treated effluent will be pumped via new bridges to the Bridesdale site.

Discharge of treated wastewater via deep injection wells on Bridesdale. Estimate 4 bores required (2 in use and 2 resting).

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	Discreet points across the area
Capital Cost Range (the higher the more expensive)	

- Potential for use as a sole or mixed solution
- Year round disposal capacity (no seasonal constraints)
- Known receiving environment
- Additional filtration through gravel aquifer before ultimately flowing to Kawarau catchment

- Sensitive to the quality of injection water with potential for clogging
- Land access agreement/ purchase may be required (shown in red coin)
- Routine maintenance /resting required
- Maintenance would need to be undertaken by specialist contractors
- Flow rate management to reduce risk of mounding and generation of river bank springs
- May cause land instability
- Requires pumping from WWTP (long pipeline and river crossing)

Option 6 – Shallow well injections

Overview

Disposal of treated wastewater via injection into the ground and shallow aquifer, for in ground treatment and dispersion.

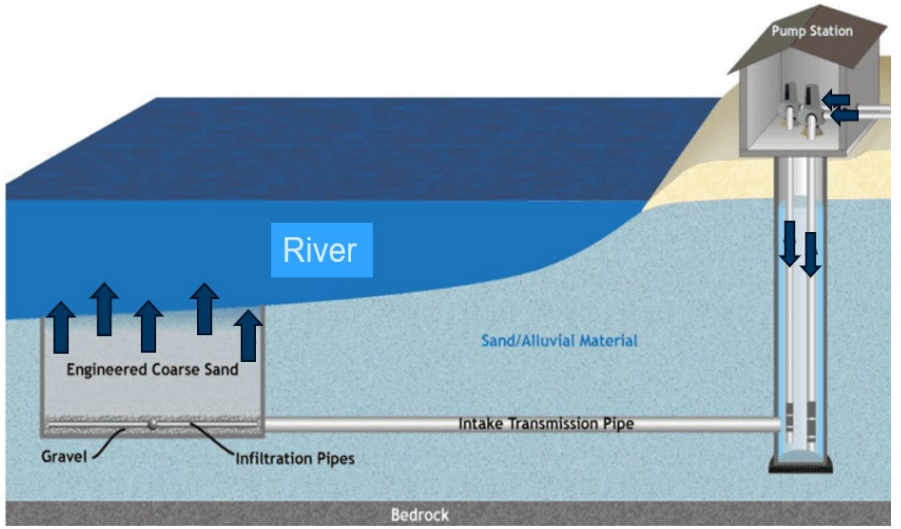
Avoids shallow soil limitations on infiltration, putting disposal water into permeable aquifer for dispersion.

Used internationally as a means of returning water to the environment.

May use a combination of well designs (vertical or angled) or gallery (horizontal well screen).

Limited length and potential for groundwater mounding effects limits individual well disposal rates, typically requiring a network of wells to dissipate large volumes.

Example: Angle drilled bore injection



Option 6 a)
Shallow well injections at Delta

Description

Shallow injection wells / gallery injection. Wide diameter horizontal or angled boreholes / gallery into river gravels under Kawarau River.

Estimate of 7-10 discharge wells required (100 m long) for discharging tertiary treated effluent from the Shotover WWTP.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	Discreet points across the area
Capital Cost Range (the higher the more expensive)	

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- Potential for use as a sole or mixed solution
- Year round disposal capacity (no seasonal constraints)
- Diffuse discharge with rapid mixing in River
- Close to WWTP and infrastructure crossing QLDC land

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- The cost for bores under river may be high due to an angled drill hole, at current the cost and feasibility of this is unknown
- Sensitive to the quality of injection water with potential for clogging
- Careful maintenance required to avoid clogging.
- Proximity to Kawarau River means headworks may be prone to flood damage and/or at risk from erosion
- Limited land areas for placement on Kawarau River Bank.
- Knowledge gap

Option 7 – Subsurface wetlands on Delta

Overview

Subsurface flow (SSF) wetlands are constructed with a bed or channel filled with media like gravel or sand. The wastewater flows horizontally and vertically through this media, which supports the growth of wetland plants.

These wetlands utilize physical, chemical, and biological processes to further improve treated wastewater quality. Microorganisms attached to the media and plant roots play a crucial role in breaking down contaminants.

Besides wastewater treatment, SSF wetlands provide habitat for terrestrial wildlife and contribute to biodiversity. They can be integrated into natural landscapes without the issues associated with free surface water wetlands, such as water fowl and mosquito.

Example: Petersfield WWTW Tertiary Subsurface Wetland (UK), 10 x 1600m2

Example: Featherston concept design subsurface wetlands

Option 7 a – Subsurface wetland on Delta

Description

Making use of historical river channel for installation of subsurface wetlands and plantings, connecting to rock filled flow paths to the Kawarau River. Estimated to be as much as approximately 1 km in total length. Engineered for natural treatment, interaction with land and aesthetics.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	Up to 10 ha
Capital Cost Range (the higher the more expensive)	

+

- Year round disposal capacity close to WWTP and existing infrastructure
- Utilise QLDC owned land
- Additional treatment of water by wetland media and plant uptake.
- Prolonged transport time through subsurface wetlands (expected to be greater than 1 week to Kawarau River). With ability to provide significantly longer flow times under average conditions
- Provides aesthetic and educational opportunities

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- Increased operational costs for maintaining the subsurface wetlands
- Potential for periodic rejuvenation (>5-8 years)
- Sensitive to the quality of treated water with potential for clogging
- Will inhibit public access over a large area inside the flood training Wall.
- Additional management of stormwater required

Option 8 –Shallow well point injection or soak holes

Overview

Disposal of treated wastewater via injection into the ground for in ground treatment and dispersion.

Used internationally to dispose of treated wastewater while reducing the impacts on groundwater, e.g. Vermont sites in the US.

May use a combination of soak holes, boreholes or well designs, depending on hydrogeology.

Provides opportunity for dissipation of wastewater where the geology has horizontal layers of low permeability soil that may otherwise limit potential infiltration

Limited length of bores/soak holes can limit individual well disposal rates, typically requiring a broad network of wells to dissipate large volumes.

Option 8 a – Shallow Well - Frankton or surrounds

Description

Soak holes, boreholes or well points, may be used to provide dispersion of wastewater to soils **above** the groundwater table. An extensive network of such soakage installments, would be required to provide for effective disposal of wastewater to ground.

Technical Complexity to build (the higher the more complex /less proven)	
Complexity of Operation (the lower the better)	
Approximate Land Area Required	Discreet points across the area
Capital Cost Range (the higher the more expensive)	

- Potential for use as a sole or mixed solution
- Year round disposal capacity (no seasonal constraints)
- Suitable geology (permeable gravels) with deep groundwater table(>40 m)
- In ground treatment and filtration through gravels.
- Potential to intersect more permeable lenses of gravels to improve infiltration capacity
- Potential fit within QLDC site (pending investigations)

- Require pumping from WWTP to various disposal zones, bore # TBA (depending investigation).
- Some areas might already earmarked for future development, potential land use conflicts
- Land access agreement (lease) may be required and from multiple parties
- Construction activities impacted by current land-use and aviation operations
- Highly sensitive to water quality and likely to require robust maintenance
- Access for maintenance will be impacted by aviation operations

Option Summary Table

Disposal option		Location of Disposal Sites		Options Shortlisted (Y/N)	Indicative cost range*
Option 1	**High rate land disposal**	a)	Delta infiltration basins	No – Not supported by iwi & large quantity of civil works	$70M to $120M
		b)	Delta trenches		$120M to $200M
Option 2	**Moderate rate land disposal**	**a)**	**Airport and surrounding area**	Yes – Retain as an option, require investigation and liaison with QAC and landowners for access	$120M to $200M (land purchase provision incl.)
		b)	Southern corridor	No – (project complexity (cost, land acquisition, bridges) Disposal rate concerns.	$100M to $150M
		c)	Alternate locations across the Shotover or Kawarau River	No - project complexity (cost, land acquisition, bridges)	$120M to $200M
Option 3	**Low rate land disposal**	a)	Doc land / Coronet peak	No – required areas needed and cost prohibitive.	$150M to $250M
Option 4	**Land flow path to river**	a)	Shotover	Yes – Not supported due to cultural view as direct water discharge, but carried forward as a 'do minimum' to meet proposed new national wastewater performance standards.	$20M to $35M
		b)	**Kawarau**		$20M to $35M
Option 5	**Deep well injections (moderate depth)**	**a)**	**Frankton**	Yes – require field investigation to confirm technical suitability and preliminary sizing, and liaison with QAC and other landowners for access	$40M to $75M** (assume no land purchase, in QLDC land)
		b)	Bridesdale	No – reason similar to Option 2c	$80M to $100M**
Option 6	**Shallow well injections**	a)	Delta	No - Technical concerns, cultural view as direct water discharge	$30M to $60M**
Option 7	**Subsurface Wetland**	**a)**	**Kawarau**	Yes – wetland provides land contact prior to discharge and additional retention time	$30M to 60M***
Option 8	**Well point injection / Soakholes**	**a)**	**Airport and surrounding area**	Yes – require field investigation to confirm technical suitability and preliminary sizing, and liaison with QAC and other landowners for access	$40M to 75M** (assume no land purchase, mostly in QLDC land)

Notes (must be kept in the QLDC internal reports):

** Indicative cost range are only for the purpose of initial options comparison. More defined cost estimates will be provided after field investigations and concept sizing work as part of short list options evaluation*

*** Viability and cost of bore injection (deep or well point) options will be determined from field investigation, subsequent technical analysis and revision of cost estimates.*

**** Subsurface wetland arrangement will result in cost update during the short list options evaluation and further design input.*

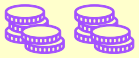
Options which are not to be assessed in the Long List Options	Reason for not assessing	
Direct pipe discharge to river	Culturally and socially not acceptable	
Rockfilter (typically <50m2 in footprint)	Culturally not acceptable	
Spray irrigation	Not realistic with land constraints, hilly terrain and winter seasons	
Surface wetland	Large open water surface, risk to aviation	

Short List of Options

The following were the Short List options selected following the MCA process:

- Option 2a -Moderate rate land disposal to Airport and surrounding area.
- Option 4b - Do Minimum – Option that Complies with proposed Taumata Arowai standards.
- Option 5a - Deep well injections at Frankton.
- Option 7a - Subsurface wetland on Delta.
- Option 8a - Shallow well point injection or soak holes at Frankton.

Summary of option preliminary assessment

Option	Technical Complexity to build	Complexity of Operation	Land Area Required	Rough Cost Range
Do Nothing, existing disposal field	Not considered a viable or acceptable longer term option			
Option 1 – High-rate land disposal a) delta infiltration basins			10 ha	
Option 1 – High-rate land disposal b) Delta trenches			25 ha	
Option 2 - Moderate rate land disposal a) Airport			70 – 90 ha	
Option 2 - Moderate rate land disposal b) Southern corridor			70 – 90 ha	
Option 2 - Moderate rate land disposal c) Alternate locations across the Shotover or Kawarau River			70 – 90 ha	
Option 3 – Low-rate disposal a) Doc land / Coronet peak			400 – 500 ha	
Option 4 – Land flow path to river a) Shotover			N/A	
Option 4 – Land flow path to river b) Kawarau			Discreet points across the area	
Option 5 – Deep well injections a) Frankton			Discreet points across the area	 No land purchase assumed
Option 5 – Deep well injections b) Bridesdale			Discreet points across the area	
Option 6 – Shallow well injections a) Delta			Discreet points across the area	
Option 7 – Subsurface Wetland on Delta			Up to 10 ha (could be less)	
Option 8 - Well Point or Soak holes			Discreet points across the area	 No land purchase assumed

Next Steps

- Site Investigations on Shotover Delta and Frankton (Apr/May 25)
- Engagement with external Stakeholders (initially QAC – May 25)
- Complete Technical Assessments of Short List Options (June-July 25)
- Short-List, Multi Criteria Assessment Workshop (August 25)
- Council Presentation of Preferred Option (September 25)
- Business Case Approval of Preferred Option (Q4 2025)
- Lodge Consent for Preferred Option (Q2 2026)
- Engineering Design Completed (Q4 2027) (Subject to Consent)
- Construction Completion of Preferred Option (Q4 2030)

Questions and/or Feedback?

QUEENSTOWN
LAKES DISTRICT
COUNCIL