



VALUER'S EDUCATION & INTEGRITY FOUNDATION

Te Tumu Ngākau Tapatahi Mātauranga mo te hunga Kaiwāriu



April 2020

The value of fresh water rights in New Zealand

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The background of the entire page is a teal-colored image showing a pair of hands cupped together, holding a stream of water. The water is splashing and creating droplets, giving a sense of freshness and movement. The hands are positioned in the center, with the water flowing from the top towards the bottom.

The value of fresh water rights in New Zealand

Considerations for property valuers and
other related professions

Review prepared for the Valuer's Education & Integrity Foundation

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Note:

The opinions expressed within the research paper are of
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Overview

This paper provides a summary of water rights as they currently exist across New Zealand, the variability of ownership and interests, and how these rights are being impacted by regulatory control amongst a raft of various stakeholder claims and involvement. It relates specifically to “fresh” water, i.e. all water except coastal seawater, and geothermal water.

The ownership of water in New Zealand has come under considerable scrutiny as different groups have different perspectives on this issue, with the legal position more often than not arguable and unclear. Despite the issuance of the National Policy Statement for Freshwater Management 2014 and its associations with the Resource Management Act 1991, there are different localised regulations in relation to water and its access being applied across New Zealand districts and councils as local government authorities endeavour to carry out their responsibilities in accordance with the national legislature and policy statement which underwent considerable amendment in 2017.

These regulations have proven (and have further potential) to significantly impact agricultural land use options and / or farming intensity, and therefore productivity. The valuation of rural land is in turn affected or potentially affected – for example, through restrictions or otherwise in land use that in many instances may not have been hitherto even taken into account by the market. Moreover, whilst there are areas of strong commonality in regulations now being imposed, equally there is considerable inconsistency as well.

Further complexity is brought about by a paradoxical state of affairs facilitating tradability of water rights by individuals and potential misalignment of responsibilities with riparian landowners, even further complexed by various qualifications / memorials appearing on property titles. There is also increasing acknowledgement of the need to incorporate te ao Māori (both formally and informally), along with growing interest and even intrusion from various community and industry organisations.

What are Water Rights?

Water, as with many other property types, is subject to both public and private rights. This may relate to rules governing extraction and use of the water to control adverse effects of the take. A variety of stakeholders¹ have rights in the water. Often, the private and public rights are mutually exclusive. The aim of a property rights regime is to maximise the incentives for property owners to maximise the long-term value of the resource. This produces the most efficient outcome for society. Property rights can arise through law, custom/tradition and use. However, the State defined and enforced property rights represent a useful starting point for an analysis of rights in water.

A good working definition of water rights is provided by Chen (2019): water rights are a type of interest that may attach to real estate ownership and may pertain to the rights to use adjacent bodies of water. Different types of water rights exist based on various forms of water that border or exist on a property. They may take the form of:

Riparian rights – in New Zealand this is sometimes known as “the Queens Chain”, and is bestowed to landowners whose property is located along flowing bodies of water such as rivers or streams. Smith & Partners (2020) observe that currently, the law generally provides that where any subdivision divides land into lots under 4 acres the council can require an esplanade reserve (a 20 metre Queen’s chain strip) as part of the resource consent for any land adjoining rivers, lakes and beaches. This means that the Queen’s chain now refers to the marginal strips and esplanade reserves, which normally are 20 metres wide, adjoining many lakes, rivers and the foreshore. There

are still however, a large amount of land ownership whereby there is no reserve or Queen's chain and the land ownership continues right down to the water. It is these types of land ownership which can be said to contain riparian rights. This usually relates to the high tide mark, but some titles may extend to the low water mark, particularly if the land is Maori land.

Littoral rights – a largely American term relating to rights pertaining to landowners. There are tides and currents that affect land bordering large, navigable lakes and oceans, but they may not flow by the land in the manner of streams and rivers. Landowners with littoral rights have unrestricted access to the waters but own the land only to the median high-water mark.

Appurtenant water rights - run with the land and not to the owner, i.e. when a property is sold, the new owner gains the littoral rights and the seller relinquishes his or her rights. An appurtenant right can be a burden or be beneficial with the term often used to describe the rights created by an easement, with the appurtenant having the benefit of the right known as the dominant land. Reed (2007) states as follows:

“For valuation of irrigated properties, it is always necessary to know whether the water rights are appurtenant to the land, or transferable separately from the land”.

Purpose of this paper

Over recent years, the topic of water rights has engendered considerable debate, misunderstanding, and uncertainty. This is against a backdrop of a large range of issues ultimately pertaining to land titles and tenure. This includes property rights of individuals, and tradability / potential marketability of such rights; impact of setting water quality and water quantity / groundwater allocations and water permits by councils and others; relationship with Resource management Act; Regional Plans; NPSFM; water use / rights challenges; considerations relating to the Treaty of Waitangi and water ownership, and the treatment of water rights in the valuation of irrigated and other rural farmlands. This complexity makes it difficult for the valuation and related professions to keep abreast of developments and take account of any impact they have or may have now, or in the future.

The primary purpose of this paper is foremost to provide a background for further discussion, and exploration of matters impacting the evaluative work of registered property valuers operating in New Zealand. It seeks to identify the primary, underlying factors behind the application of water rights in undertaking professional assessments. Additionally, it also has the intention of facilitating the unearthing other factors not explored or even identified herein thereby helping to identify matters requiring further consideration and study. Taking into account local or regional idiosyncrasies, along with overarching considerations, facilitates the development of guidelines which may ultimately prove beneficial for wider adoption and application. Ultimately, prioritising the issues in this way is likely to result in the development of a more effective educational resource for property professions.

It is important to note that this paper does not seek to resolve mismatches in property rights that might result in more efficient, equitable and sustainable allocation and use of water. Rather it seeks to examine the range of factors to be taken into account by industry professionals undertaking evaluative tasks on land affected by water rights, including the determination of demarcations between actual and perceived rights to take and use water. Determining the basis of water rights - whether legal, by convention, or customary - and understanding the property interests associated with the taking and use of water (including, private interests, interests conferred by existing

consents, Treaty, Maori and societal expectations) is fundamental to understanding impact on rural land values.

Legal position (overview)

Synopsis

The physical and legal limits of land are often defined not just by subsoil and airspace, but also by land adjoining and under water. From a legal viewpoint, water might be viewed in some ways as those things existing or “growing” on the land and some built structures, in that they are all part of the land. However, sufficient differences require separate considerations be given to rivers, lakes, and lagoons, as well as foreshore / seabed areas and determination of territorial limits out from the baseline of the sea.

Property rights in general have been defined as those rights and duties established through custom, convention and law that is not just a purely legal term conferring ownership, rather “the rights to use the property which is owned” (Harris Consulting, 2003). Thus, in the case of water there are a set of private property rights which have been created in public property (the water resource) through a resource consent.

Water or irrigation rights can be conveyed to agricultural land which may have a material impact on the value of that land, in the same way as excavation or mineral rights can be. However, some Resource Consents relating to use of a resource or land, and some water rights, are considered under common law as a personal asset and may not be directly linked to a parcel of land.

Bennion et al. (2009) provides a concise summary of the general, overall position of water in New Zealand in stating that:

“At common law, natural water, that is water flowing on or under land and not confined to any artificial receptacle, cannot be owned by any person. The common law also provides that a person may use surface or underground water and is not liable to adjoining owners for the reduced flow that they may receive. Where a person owns land on the banks of a river or stream, they have rights to take water for ordinary domestic purposes and for watering stock, and a right to take water for “extraordinary” purposes, such as industrial uses or irrigation, provided they return substantially the same volume and quality of water back to the river or stream”

These common law rights have been in abeyance or otherwise “nationalised” since the passing of the Water and Soil Conservation Act 1967, restrictions which have been basically continued in the Resource Management Act 1991 (RMA). Section 14 of the RMA in particular outlines a number of restrictions relating to water.

The Resource Management Act 1991 (RMA)

The “Resource Management Act” 1991) is a very significant piece of legislation which is designed primarily around providing environmental guidelines and controls that are generally regarded as those promoting the sustainable development of natural and physical resources, including water. The Act itself states its purpose as being “to restate and reform the law relating to the use of land, air, and water”.

The current version of this Act is over 800 pages in length and has been amended over 130 times since its assent. Indeed, it has been impacted by a plethora of issues including Māori claims settlements, fire and emergency issues, civil defence matters, judicial reviews (in addition to Supreme, District and Senior Court and local government regulations), economic changes and environmental reviews, as well as a host of regulations relating to energy, maritime and land transport, building, rating valuation, historic places legislation, public finance and other considerations. As at date of writing, other amendments affecting the RMA (e.g. Building Amendment Act 2012, Resource Legislation Amendment Act 2017, and the Contempt of Court Act 2019) are have also yet to come into force. In short, by any definition, this legislation is complex, wide-ranging, and often difficult to comprehend. Yet it is critical to the matter of water rights in New Zealand.

Restrictions relating to water under the RMA essentially breaks down to limiting the usage and taking, or the redirecting of fresh water (S14). More specifically, it provides that water may not be taken, used, dammed, or diverted unless permitted by a rule in a regional plan, or where a resource consent has been obtained. The only exceptions are use of water for domestic, stock and firefighting purposes, and geothermal water for Maori communal activities.

The primary emphasis here surrounds the ability (or not) to undertake any action that seeks to contravene a “national environmental standard” or regional rule. These standards include “water quality, level or flow” (S43), and may prohibit, allow or restrict such activity (S43A) including the requirement of local authorities to review any permits or consents they might have granted. A regional rule means a rule made as part of an existing operative, or even proposed, regional plan (43AAB). An important aspect here is that a rule or resource consent that is either more stringent or lenient than a national environmental standard prevails over the standard (S43B). Such stringency or leniency can relate to otherwise prohibited or restricted activities, land use, water permit, or resource consents. However, S43C provides that generally speaking, the more stringent of *either* a water conservation order or a national environmental standard always prevails.

To add further complication to these general principals, there are a host of regulations contained in the RMA that describe the application of bylaws, discharges, the restrictions on powers to make national environmental standards (including by local authorities S44), and the purpose and application of national policy statements by Ministers (S45-55).

The legal framework of rivers and other waterways

The way in which rivers and other water bodies might be regarded in a legal sense are strongly rooted in an historical context that pre-dates more formalised or legislated recognition. Warner and Svold (2020) report that “the Maori tribes” (iwi) of Whanganui, New Zealand, declare their inseverable connection to their ancestral river as follows:

“The great River flows from the mountains to the sea. I am the River, the River is me.”

For more than 700 years the Whanganui tribes controlled, cared for, and depended this river. It is their awa tupua - their river of sacred power (Warner & Svold, 2020). However, under European occupation the iwis’ traditional authority was undermined—and finally extinguished by government decree. However, in 2017 the NZ Parliament passed legislation (“Te Awa Tupua (Whanganui River Claims Settlement) Act”, 2017) settling the historical claims of Whanganui Iwi as they relate to the Whanganui River. This legislation declares that:

“Te Awa Tupua—the river and all its physical and metaphysical elements—is an indivisible, living whole, and henceforth possesses “all the rights, powers, duties, and liabilities” of a legal person”.

As a result, the Whanganui River in New Zealand is now considered to be “a legal person” with all its accompanying rights, powers, duties, and liabilities. Warner and Svold (2020) point out that based on the Whanganui precedent, 820 square miles of forests, lakes, and rivers—a former national park known as Te Urewera - also gained legal personhood. Soon Mount Taranaki is expected to become the third person. This change in contemporary thinking is not just restricted to New Zealand. Similar attempts to establish legal rights for other natural features such as India’s sacred Ganges and Yamuna Rivers, and in Toledo, Ohio, legal standing has been granted in February 2020 to Lake Erie.

The big question here is the extent to which such legislative devices might be able to be put into effect. For example, will nature be able to sue humans for the damage they inflict? Warner and Svold (2020) comment that as no lawsuits have yet been brought it is difficult to speculate just what the possible outcomes might be. There are certainly implications beyond seeking to remedy a history of broken promises under Treaty of Waitangi obligations to Māori. The important point to note here, as pointed out by Warner and Svold (2020) is that despite apologies, atonement and “healing,” at the end of the day ownership of the river to the Whanganui iwi has not been restored.

Therefore, it would seem that we need to revert to guidance provided by legal commentators such as Bennion et al. (2009) whereby ownership of water bodies essentially traces back to the transfer of sovereignty of the islands of New Zealand occurring as a result of various local and Imperial instruments of which the Treaty of Waitangi is considered the most important. Whilst it must be borne in mind that almost all activities in the beds of rivers and lakes are now strictly controlled by the Resource Management Act, it may be shown that (primary source derived from Bennion et al., 2009):

- In the case of **rivers**, a doctrine known as *medium filum aquae* is generally applied, meaning that the owners of the land on the banks of non-tidal rivers own to the centre line. A number of situations exist where the Crown has ownership e.g. over navigable rivers or places where public works are intended. According to Bennion et al. (2009), whether or not Māori customary land has been extinguished is an “open question” despite case law holding that ownership passes *ad medium filum aquae* when riparian lands are sold. (it is pointed out that blanket application of *ad medium filum aquae* has been heavily criticised by the Waitangi Tribunal).
- In the case of **lakes**, ownership is held by the owner (or owners) of the surrounding land, with separate owners’ interests represented by a wedge shape piece of land whose apex is located at the lake’s centre, following the same *ad medium filum aquae* doctrine as for rivers. Māori claims to customary ownership of lakebeds have been largely upheld.
- In the case of **foreshore and seabed**, it is now held that there has been no extinguishment of customary rights and the process of claim hearings and the possibility of issuing freehold titles has been underway since a decision made by the Court of Appeal in *Ngati Apa v A-G* [2003] 3 NZLR 643, overturning the *Ninety Mile Beach* [1963] NZLR 461 (CA) decision made some years earlier. However, subsequent legislation (“Foreshore and Seabed Act”, 2004), vested full legal and beneficial ownership of the public foreshore and seabed in the Crown – but at the same time expressing kaitiakitanga which recognises ongoing customary rights for undertaking certain cultural practices and activities. This legislation has since been repealed (in 2011) with the “Marine and Coastal Area (Takutai Moana) Act” 2011) which has been described as a “non-ownership model” of the public foreshore and seabed. Still embroiled in

a degree of controversy, it essentially restores the right of iwi to seek customary title in Court, along with customary interests of Māori in the common marine and coastal area.

Reinforcing the foregoing is dialogue contained in the preamble to the "Marine and Coastal Area (Takutai Moana) Act" 2011) which states that the legislation:

"...takes account of the intrinsic, inherited rights of iwi, hapū, and whānau, derived in accordance with tikanga and based on their connection with the foreshore and seabed and on the principle of manaakitanga. It translates those inherited rights into legal rights and interests that are inalienable, enduring, and able to be exercised so as to sustain all the people of New Zealand and the coastal marine environment for future generations"

- In the case of **lagoons**, the common law rules follow that for foreshore and seabed, as above.
- In the case of **formerly dry land now eroded (under the sea) or become part of a river bed**, landowners retain title to the whole of the land including that area now covered, with the Certificate of Title able to be amended allowing the formal inclusion of areas added by gradual accretion.

Additional complexities

Overall, the legal position in relation to water rights held by Māori is unclear and the subject of significant current debate. This aspect is discussed in some detail later in this paper.

Also adding further complexity and with some aspects related to the foregoing, is the matter of commercial rights access to water supplies. The situation relating to the manufacture of bottled water in particular is attracting a significant level of community debate. This aspect is also covered later in this paper.

With regards climate change, Stats NZ (2017b) predict that pressures on water flows and the availability of water will continue to exacerbate. This presents a major problem via flow reductions which result in less water available for ecosystems and human use. New Zealand's economic dependence on primary industries means we are relying on taking water for irrigation. Therefore, Stats NZ suggest that altered flows can negatively affect the health and mauri (life force) of freshwater ecosystems by negatively impacting on the habitats of freshwater species, landscape aesthetics, and the suitability of our freshwater environments for recreation. Therefore, issues related to fresh water supply affect the whole community, not just landowners.

The National Policy Statement for Freshwater Management

The National Policy Statement for Freshwater Management (NPSFM) serves to strengthen the RMA, and is the top planning instrument under the RMA. The NZ government website states that the NPSFM "provides direction on how local authorities should carry out their responsibilities under the Resource Management Act 1991 for managing fresh water" (Ministry for the Environment, 2020). Local authorities must give effect to this Statement through their own regional policy statements and regional and district plans. RMA decision makers must also comply with NPSFM when considering consent applications.

The NPSFM came first into effect on 1 July 2011 after a draft issuance in 2008. The current NPSFM - The National Policy Statement for Freshwater Management 2014 (Freshwater NPS) – continues to set out the objectives and policies for freshwater management under the Resource Management Act 1991. It came into effect on 1 August 2014 and amendments made in August 2017 took effect on 7 September 2017.

The current government has issued a Draft National Policy Statement for Freshwater Management, with proposals for consultation issued in September 2019. However, as pointed out by Barron and Sorensen (2015), the current National Policy Statement for Fresh Water in general may only require regional councils to comply by 2025, and with some exceptions by 2030.

The role of regional councils

Regional Councils – general empowerment issues

Regional councils are empowered under the RMA to grant water permits which allow the holder to take, use, dam or divert water subject to availability. Consents are not required for water takes in some limited circumstances (e.g. domestic use, stock water, firefighting), and consents cannot be granted for in stream use.

Regional Plans and Policies

The purpose of a regional plan has been described (Environment Foundation, 2018a) as the means by which a regional council is assisted in carrying out its functions in order to achieve the sustainable management purpose of the Resource Management Act. They usually contain rules governing the use of resources, having a significant effect on the use of natural resources within the region. In addition to this, Regional councils are obliged to prepare a regional policy statement which provides an overview of the resource management issues of the region and policies and methods to achieve integrated management of the natural and physical resources of the region (Environment Foundation, 2018b). In providing an overview of the resource management issues for the entire region, it also sets out the objectives, policies and methods to manage regionally significant issues. Regional and district plans must thereby “give effect to” regional policy statements, meaning they must “implement” obligations contained therein.

According to the Ministry for the Environment (2019b), Regional Policy Statements throughout the country largely cover the same major topic areas (i.e. water, air, land), with councils moving towards combining their regional plans for managing land, water and air into a single plan structure.

Examples of regional plans include (updated from original source Boffa Miskell Limited, 2015):

- Tasman Resource Management Plan
- Auckland Unitary Plan
- West Coast Regional Land and Water Plan
- Waikato Regional Plan
- Waikato Regional Coastal Plan
- Canterbury Land & Water Regional Plan
- Regional Coastal Environment Plan for the Canterbury Region
- Horizons Regional Council - One Plan
- Hawkes Bay Regional Resource Management Plan
- Hawkes Bay Regional Coastal Environment Plan

Plans are increasingly likely to include a catchment-based approach, partly to give effect to national direction, such as the National Policy Statement for Freshwater Management (e.g., Greater Wellington Regional Council's Proposed Natural Resources Plan, Northland Regional Council's Proposed Regional Plan for Northland, and Horizons Regional Council's One Plan). Whilst regional plans contain objectives, policies and rules, integrated plans contain issues and methods sections which tend to be embedded in the Regional Policy Statement.

Regional Policy Statements tend to be structured around regionally significant issues, and associated plans (such as coastal plans) typically reflect the same structure. Regional councils are required to maintain a regional coastal plan to give effect to the New Zealand Coastal Policy Statement (NZCPS) and consent authorities must have regard to it¹. It operates alongside the Resource Management Act. The NZCPS also overlaps with the jurisdiction of other RMA plans, such as district plans and land and water regional plans. Many councils are now integrating their land, water, air and other plans into one document, and some are also including the coastal plan. (Matters relating to coastal plans are for the purposes of this discussion largely avoided, as they primarily relate to sea water rather than fresh water considerations, thus diverting attention away from the primary matters focussed on here).

Whilst the Resource Management Act clearly requires regional councils to have a Regional Policy Statement, the Ministry for the Environment (2019b) points out that Regional plans fill in the details and provide the 'bottom line' in terms of enforceable rules.

Orders, Consents and related factors

Water Permits

Land use and subdivision consents are attached to the land and transfer automatically to the new owner when land is sold. However, water permits, which are in reality a form of resource consent, are not automatically transferred when land is sold. Section 136 Resource Management Act 1991 provides as follows:

"Water permits for damming or diverting water can only be transferred to other parties if they are the owner or occupier of the site to which the permit relates. Other water permits can also be transferred to another person or another site in the same catchment, aquifer or geothermal field where this is expressly allowed in the regional plan or has been approved by the consent authority. An application for approval from the consent authority is considered as if it were an application for a resource consent and the consent holder were the applicant"
(Environment Foundation, 2014).

In general, waters permit comply with the following rules, whereby they:

- do not run with the land, but are personal to the consent holder
- are transferable in some circumstances, and may be sold, gifted or 'leased'
- can be acted on by other persons with the permission of the consent holder (unless there are conditions to the contrary)
- do not provide ownership of the water
- do not provide a guarantee of a water body's availability

¹ The Minister of Conservation has responsibility for approving the coastal marine area component of regional coastal plans, in recognition of the Crown's and iwi special interests in the coastal marine area

- do not prevent 'upstream' consents being granted which may derogate from permitted grants.

Nonetheless, the rules under which consents operate certainly affect the nature of the property rights. However, bear in mind that the regional council has the capacity to use the following techniques to put this into effect:

- minimum flows
- staged flow regimes (reduction in allocation with decreasing flows)
- maximum (or sliding maximum) rate of takes
- allocatable volumes
- sharing regimes
- rostering regimes

National Environmental Standard on Ecological Flows and Water Levels

The Ministry for the Environment (2008) issued its Proposed National Environmental Standard on Ecological Flows and Water Level Discussion document in March 2008. It is currently stated to be “on-hold”. The Ministry for the Environment expresses its aim being to “promote consistency in the way we decide whether the variability and quantity of water flowing in rivers, ground water systems, lakes and wetlands is sufficient”. Despite its issue date, consultation on this document closed only quite recently on 31 October 2019.

According to the Ministry for the Environment (2008) the current Government wants to improve the current management of freshwater, since it is held that water is suffering as a result of urban development, agriculture, horticulture, forestry and other human activities. There is also a lack of robust regulation, monitoring and enforcement. It is proposed that Te Mana o Te Wai be further strengthened as the framework for freshwater management and that, inter alia:

- there needs to be greater control exercised over “high-risk” farming activities
- a limit needs to be placed on agricultural intensification
- farm management practices need to be improved overall

An independent advisory panel have been tasked with providing a report on the consultation submissions. This will include recommendations. The first part of the report issued in late 2019 (Ministry for the Environment, 2019a) with Ministers considering the report before deciding whether or not to proceed with the policy proposals or make changes. This will include additional impact analysis, and an evaluation of national direction under section 32 of the Resource Management Act 1991. Unfortunately, whilst some firm conclusions were reached, the taskforce report is by its own admission largely inconclusive:

“Changing water flows can have significant effects on habitats, but information about the extent and scale of these impacts on our ecosystems is lacking. Other water issues like pollution also have an effect, but the cumulative impact of these changes on our social and economic values is difficult to determine” (Ministry for the Environment, 2019a, p. 4)

Water Conservation Orders

Fifteen rivers and lakes in New Zealand, having been recognised as having “outstanding amenity or intrinsic values” have had water conservation orders placed on them. These orders are “designed to

recognise and protect the outstanding values of particular bodies of water. They may be applied over rivers, lakes, streams, ponds, wetlands or aquifers and geothermal water” The water bodies include:

- | | |
|--------------------------|---------------------|
| 1. Motu River * | 8. Rangitikei River |
| 2. Rakaia River * | 9. Kawarau River |
| 3. Lake Wairarapa * | 10. Maitai River |
| 4. Manganuioteao River * | 11. Buller River |
| 5. Lake Ellesmere * | 12. Motueka River |
| 6. Ahuriri River * | 13. Mohaka River |
| 7. Grey River * | 14. Rangitata River |
| | 15. Oreti River. |

Those water consents denoted with an asterisk * above have been issued pre-RMA. The WCO is regarded as a “powerful instrument” prohibiting or restricting a regional council issuing new water and discharge permits, although it cannot affect existing permits. Regional policy statements, regional plans and district plans cannot be inconsistent with the provisions of a water conservation order.

According to Ministry for the Environment (2018), WCO’s are designed to provide for the preservation - as far as possible – of the water body’s natural state. The protection of characteristics which the water body has or contributes to covers a range of issues including the aquatic habitat / fishery, as well as recreational, historical, spiritual, or cultural matters. There is also an intention to preserve any significance in accordance with tikanga Māori.

Consented Freshwater takes

The “Big Picture”

According to Stats NZ (2017a), other than permits for hydroelectricity, irrigation is the largest consented consumptive use of water (around 66 percent of consents) in New Zealand – refer Figure 1. They state that groundwater irrigation consents are largely concentrated in Canterbury, while surface water irrigation consents are more evenly distributed across the country. Furthermore, the largest potential impact on freshwater flows of consented takes is in small rivers where there is a combined effect of a large number of consents, each allowing moderate volumes of water to be taken from the same small river. Irrigation has potentially the most widespread impact on river flows across the country; however, consents to take water for hydroelectricity, industrial, and drinking uses are important in some catchments.

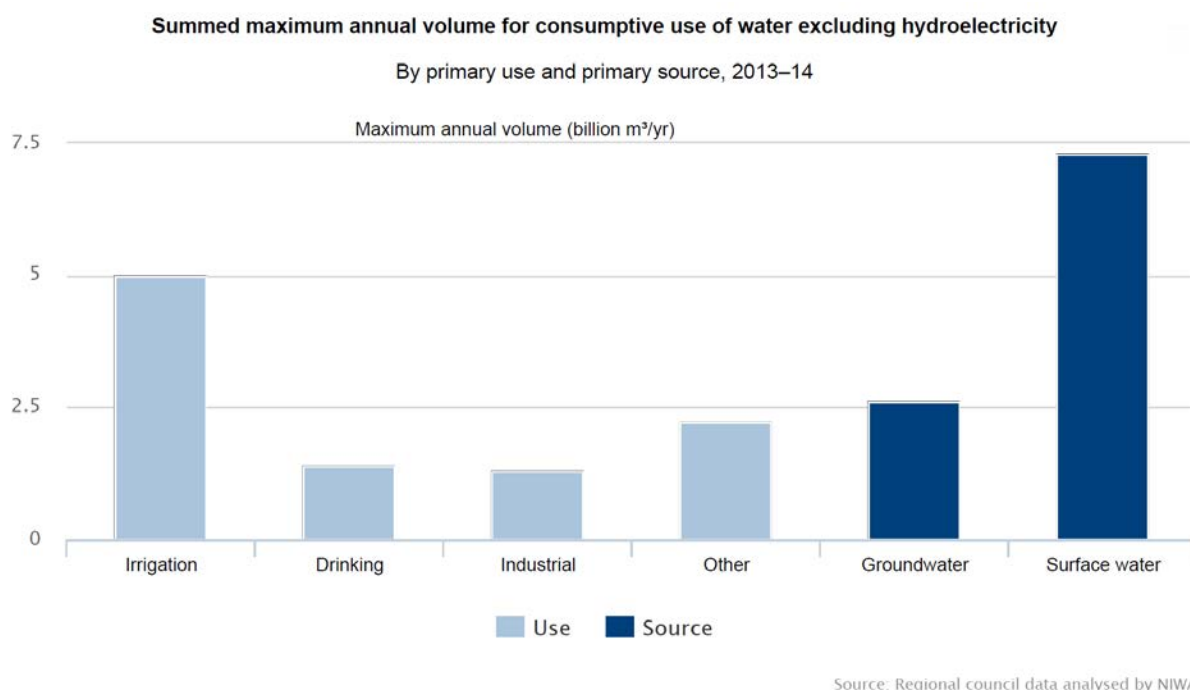
Similarly, the National Institute of Water & Atmospheric Research have also found that the sum of irrigation is by far the greatest of any water use (excluding hydro) due to the high number of consents for this use, and that there are approximately twice as many groundwater consents than surface water consents (NIWA, 2016, 2018). They have provided evidence that irrigation uses have resulted in the highest rates of stream depletion across the country, although takes for hydro, industrial and drinking uses are important in some catchments with consumptive hydro-power uses having potential to greatly deplete some large rivers (e.g., the Southland Waiau). NIWA have also found that in many cases these schemes also augmented river flows (e.g., Waikato River), although in some locations depletion from other uses exceed flow augmentation from non-consumptive hydro-power uses.

However, Stats NZ (2017b) comment that whilst more than half the water allocated (or consented) by councils is for irrigation, the actual amount of water actually used is unknown. Nonetheless they find that the most widespread cause of altered river flow from water takes appears to be from

irrigation. However, quantifying the timing and extent of connection between groundwater takes and river flow depletion can be difficult (NIWA, 2016). NIWA (2016) also have found that resource consent data from all 16 regional and unitary councils show that groundwater takes are particularly common in Canterbury, which accounts for 56 percent of total consented groundwater volume. Earlier research undertaken by Corong et al. (2014) agree that water consented for irrigation varies by region, with Canterbury accounting for nearly 65 percent of the total consented volume of water nationally. A further 9 percent of the consented volume is in Marlborough, followed by 7 percent in Otago. (Corong et al., 2014).

One way or another irrigation in New Zealand has certainly allowed for the significant expansion of a range of farming systems. In fact, it has been estimated (Corong et al., 2014) that its impact on New Zealand GDP impacts range between \$3.3 billion and \$6.5 billion annually with the current figure likely much higher.

Figure 1 - Volume of water use by type of use, and source (adapted from primary source: Stats NZ, 2017a)



Consenting variations and restrictions

There are National Regulations regarding the measurement and reporting of consents for fresh water takes above five litres per second. Some rules also restrict the amount of water that can be taken for certain purposes. Guidelines surrounding freshwater takes characteristically impose the following directions:

1. Water takes will require resource consent if the water is being sought is for irrigation or industrial purposes, whereby (in most cases) the extraction will result in more than 5 cubic metres per day.
2. Water uses requiring resource consent may be termed “controlled, discretionary and non-complying” and will contain detailed requirements or conditions allowing a water use activity to be undertaken

3. No consent is required for “permitted” water takes - but conditions will inevitably apply (i.e. typically, any person can take up to 5 cubic metres of water per day from either ground or surface water, except for certain identified areas within a region)
4. Prohibited activities are not permitted and resource consents cannot be granted.
5. Drilling a bore requires a consent even if the take of groundwater will be a permitted activity

Every region in New Zealand specify instances where taking water from surface or groundwater may be 'permitted' and therefore no special permission or resource consent is required. For example, the Tasman District Council's regulations (Tasman District Council, 2018) permit the taking, diversion or use of fresh water for any purpose (including domestic water supply) without the need for a resource consent provided that the water:

- is used for stock drinking water is not limited.
- Is taken for ballast is not limited (inshore coastal water)
- is taken and used for any domestic water supply during periods of water rationing
- is subject to various maximum take levels typically ranging from 5 cubic metres per day

Other restrictions include:

- The taking or diversion of water must not cause any stream or river flow to cease.
- Fish and eels must not be prevented from entering the reticulation system.
- Other individuals must not be prevented from taking water for their domestic or stock drinking water supply needs.
- There is not resultant erosion of land or the bed or banks of any river.
- The diversion is not a diversion of groundwater or surface water for land drainage.

Resource consents can only be issued for a maximum of 35 years, with a minimum of five years. Each council has differing approaches, however five to 10-year consents are common. At the expiry of the consent there is no automatic right of re- issue of a consent as policies and rules may have changed (Barron & Sorensen, 2015).

Water allocations and re-allocations

The majority of regional councils in NZ undertake a wide range of monitoring activities of freshwater resources. The approach taken by regional councils to address water quantity allocations has been to set water quantity limits, however despite the existence of the RMA, the type of limit and how it is enforced varies widely. First-in-first served is the predominant method for allocating available 'out of stream' water to users under the RMA.

There is little doubt that setting water quality limits is a big challenge for councils. To date, enforceable limits for fresh water quality have often been set in place after problems emerge, with targets and methods for improvement then put in place. It should be also be noted that in some regions Councils (e.g. Canterbury) have determined that there will be no new allocations for groundwater, and any transfers even requiring part surrender. In such instance's allocations have typically been fixed (at best) - and by 2008 new applications largely ceased.

Moreover, NIWA (2018) have observed that not all regional councils are maintaining historic consents conditions as part of their data delivery services. For example, councils may be removing old consents or overwriting old consent conditions from their data services as consent details are updated. In addition, new consents can be granted to replace old consents even before the older consent expires. Nonetheless, there is no guarantee under the RMA that a water permit will be

replaced when it expires. Regardless, certainty about the ability to both exercise and renew a water permit is important in facilitating investment in irrigation and associated land uses. Registered valuers therefore face a challenging task as they need to determine how existing and proposed water allocations may affect a property in order for them to ascertain the value of the investment on a case by case basis.

Many Councils have also established waiting lists to record when potential water users first register an interest in being granted a new water permit to take water. This occurs where the Water Management Zone is fully allocated. In theory at least, this approach guides the re-allocation of any water that may become available in the future in that zone.

Acknowledging te ao Māori

Despite indigenous rights having been recognised by the Supreme Court and the Waitangi Tribunal under the Treaty of Waitangi, water rights have yet to be formally recognised at law or by government policy. This section attempts to provide a brief glimpse of how that plays out in society today against a backdrop incorporating Māori world view, Treaty obligations, and emerging issues and regulations.

Te ao Māori – whakapapa, kaitiakitanga, mauri and whenua

Traditional Māori values form the basis for explaining into te ao Māori. They have been taught for hundreds of years, and are primarily based on Māori knowledge passed down from ancestors (Harmsworth, 2005). They are largely based on traditional concepts, beliefs and values, and shape the thinking of many Māori. Therefore, Harmsworth (2005) strongly suggests that Māori values form the basis for developing principles, protocols, ethical and cultural standards, and for guiding philosophies for culturally based sustainable economic development. According to Wheeler (2005), a core component of this includes key cultural values and principles such as whānaungatanga, kaitiakitanga, and manaakitanga. These Māori and other environmental principles act to sustain natural resources which have the objective of looking after the environment and caring for the whenua, through good practice and sustaining natural resources like soil and water.

According to Barlow (1991), there are reputedly seventy gods in the Māori pantheon, with eight of them widely known. The supreme god is Io. Another one of these eight is Tangaroa, god of the sea lakes and rivers, with dominion over all creatures which live in them. Barlow (1991) observes that although it may be true that “Māori have all but abandoned their traditional Gods...” they have nonetheless attempted to mix aspects of their traditional beliefs with Christian and other concepts. One concept where this definitely seems to hold true is mauri which may be loosely interpreted as “power of the gods” particularly through Io. It is through its life force that the oceans, rivers and forests can maintain a sort of equilibrium to the extent that the mauri can be returned through conservation (rāhui) and appropriate ritual ceremony.

(Ataria et al., 2018) observes that the Māori world-view also considers that, in terms of science, you cannot consider matters in isolation. Indeed, the very definition of whakapapa has greater complexity than sometimes interpreted, as observed by a Māori Kaumātua:

“In our world everything is connected... Whether we are talking ... about ngangara [insects], whether we are talking about the worms, the fish – the whatever. You all ‘ana’...it’s a family tree. That’s why we use that kupu [word, or message] all the time: whakapapa.... It’s our family tree. But when we talk in

terms of our family tree we are not just talking about ourselves as humans. That's that whole connectiveness in terms of everything... So, in terms of our so-called science – if I wanted to do a science project on say studying the totara (Large trees, the timber of which is often used in carving) - it's not just about the totara. It's about the totara's nieces, nephews, brothers, sisters. Not just about the tree standing there, but the whenua (land) it is sitting on, ngā ngangara [the insects] ..., ngā kai whāngai [the food].” (Doherty, 2018)

An example of how the foregoing might play out exposes an underlying western concept of morality embedded within, for example, the New Zealand 1987 Conservation Act whereby a dichotomy between 'man' and 'nature' occurs. This dichotomy serves to alienate all humans, including and more particularly Māori, from their lands. This is quite apart from an inability to practice kaitiaki responsibilities. Thus, the conclusion reached by Ataria et al. (2018) is that Māori environmentalists and conservationists conduct their assessment on not only the impact on ecology and economics, but also adopting a much broader world-view which incorporates culture and identity, as well as taking into account the whakapapa or interconnectedness of the issues.

Treaty of Waitangi

A plethora of authors over the last few decades have observed that in order to understand the complexities surrounding the status and use of Māori land it is necessary to understand something of the past (this includes valuation authors such as Asher & Naulls, 1987; Green, 1991). This has been eloquently put as “the threads of our past are integral to the tapestry picture of our present and future” Green (1991). The contention here is that Māori land issues are impacted by the history as to how this land was managed in the past – in turn affecting the conduct of valuations including land in private ownership.

The importance of land and water (along with indigenous fauna and flora) as part of Māori's biological heritage is implicit within Article the second [Article 2] of the English version of the *Treaty of Waitangi* [*Te Tiriti O Waitangi*] 1840). It states that “Her Majesty the Queen of England confirms and guarantees to the Chiefs and Tribes of New Zealand and to the respective families and individuals thereof the full exclusive and undisturbed possession of their Lands and Estates Forests Fisheries and **other properties** which they may collectively or individually possess”. A recent translation of the Māori version of the same article states (Kawharu, 2004) “The Queen of England agrees to protect the chiefs, the subtribes and all the people of New Zealand in the unqualified exercise of their chieftainship over their lands, villages and all their **treasures...**” The notion and specific expression of “lands” (which by legal definition includes water), or otherwise “treasures” (which might also include water) are therefore held by many to represent key Treaty obligations.

injustices related to the way in which the Crown has upheld their responsibility as a Treaty partner goes to the very heart of Treaty grievances. Ultimately this has led to the establishment of the Treaty of Waitangi Tribunal whose primary task is (but not limited to) the investigation of land disputes between the Maori and the crown with retrospectivity back to 1840². The Tribunal is cognisant that under British tradition and in terms of the law applying in New Zealand, it has been held that water is to be considered part of the land itself: for example, in *New Zealand Land Law*, it is maintained that “at common law, land does not just mean the soil, subsoil and airspace; it includes things

² The larger picture is that the Tribunal, established by the "Treaty of Waitangi Act" 1975) is a commission of enquiry designed to hear Māori grievances against the Crown arising out of all breaches of the principles of the Treaty (O'Malley et al., 2010).

growing on the land and some built structures” (Bennion et al., 2009, pp. 23-24). Technically this therefore includes trees, crops, water, and animals.

Aside from any formal Treaty obligations, it has been previously commented that the legal framework around water bodies flows naturally from the recognition of the river as a person and an ancestor. This is because, central to Maori cosmology, is a view that sees the living world as an extended relationship network, in which humans are neither superior nor inferior to any other life form (Warner & Svold, 2020). All are linked by shared descent from Earth and sky. Warner and Svold (2020) suggest that this exemplifies Maori values of connectivity to nature, a relational view of the world, an ethic of reciprocity, and a sacred regard for the whole of creation – all principles of personhood that may contain solutions to environmental crises.

In addition, it has been previously noted that the "Marine and Coastal Area (Takutai Moana) Act" 2011) has restored customary interests in the common marine and coastal area that was extinguished by the "Foreshore and Seabed Act " 2004). The former Act gives acknowledgement to the Treaty of Waitangi by allowing for the participation of iwi, hapū, and whānau in specified conservation processes, and for recognition and protection of customary rights along with recognition and exercise of customary marine title.

[WAI262, and WAI 2358](#)

Mark-Shadbolt et al. (2018) explain that the origins of the Wai 262 Inquiry are strongly rooted in concerns relating to conservation and biodiversity of indigenous flora. However, the Wai 262 claim extends the scope of Treaty of Waitangi claims to include ownership of Maori culture and its products (Levine, 2010). The claim recommends “wide ranging reforms to law and policies affecting Māori culture and identity” (Ministry of Justice, 2017). Fundamentally, the Wai 262 claims that under the Treaty of Waitangi, Māori rights to taonga katoa (all their treasures) are guaranteed - and that indigenous culture, flora, and fauna are all taonga. However, the Crown maintains that the government is under no obligation to protect Maori rights to them under the Treaty.

The relevance of this case is that if, under the Treaty of Waitangi, Māori rights to taonga katoa includes water resources, the Crown is under no compulsion here since they maintain that property rights cannot apply to such things under New Zealand law.

Therefore, the position of the Crown, i.e. that no one owns water, has had the effect of removing Māori from their custodial role and traditional relationship with tribal waterways, and according to Daly (2019) has commodified water. Māori disagree that ‘nobody’ owns water, and want the authority over their resources under Māori law returned to them. The conclusion here is that current provisions in law which required Māori to be consulted in their role as kaitiaki are viewed as insufficient (Daly, 2019).

The Ministry of Justice (2017) in its commentary recognise that the claim includes concerns over “the place in contemporary New Zealand life of core Māori cultural values such as the obligation of iwi and hapū to act as kaitiaki (cultural guardians) towards taonga (treasured things) such as traditional knowledge, artistic and cultural works, important places, and flora and fauna that are significant to iwi or hapū identity”. Although “water” is not expressly mentioned here, the implications are that along with other taonga it is recognised that the claim itself is about the place of such matters in New Zealand law, as well as government policies and practices.

Moreover, the concept of tino rangatiratanga infers full authority viz the kaitiaki relationship with taonga species to Māori, not just what might be considered “reasonable” by its Treaty partner.

However, the Tribunal's recommendation statement that "no one interest should have automatic priority" (Waitangi Tribunal, 2011, p. 96) is problematic. This is because, inter alia, that is inconsistent with their own conclusion in acknowledgement of Declaration on the Rights of Indigenous Peoples. In acknowledging that these principles speak to the heart of the Wai 262 claim, the Tribunal also admit that these same principles provide "valuable guidance on those issues and reflect in many ways the spirit of the principles of the Treaty of Waitangi." (Waitangi Tribunal, 2011, p. 43). Unfortunately, it would seem that spirit has not been translated into the Tribunal's Wai 262 recommendations. It also unlikely to provide a satisfactory solution to a major problem identified in their own news release, that:

"...in many respects, current laws and government policies fall short of partnership, instead marginalising Māori and allowing others to control key aspects of Māori culture. This leads a justified sense of grievance, and also limits the contribution Māori can make to national identity and to New Zealand's economy." (Ministry of Justice, 2017)

Therefore, in agreement with Levine (2010), it is submitted that Wai 262 claimants are probably "painted into a corner" and may not find Wai 262 affording an acceptable solution.

In the footsteps of WAI262, the New Zealand Māori Council (NZMC) lodged the Wai 2358 claim with the Waitangi Tribunal in February 2012. This claim concerned the Crown's resource management reforms, which the NZMC argued were proceeding without having first established a regime to recognise and provide for Māori rights and interests in freshwater (Ministry for the Environment, 2019a). Here, the matter of consistency with the principles of the Treaty were being tested. According to Ministry for the Environment (2019a), the NZMC argued that there was significant inconsistency. In acknowledging Mana Whakahono-ā-Rohe agreements in the RMA and the strengthening of Te Mana o te Wai³ in the National Policy Statement for Freshwater Management 2014 (amended 2017), the RZMC argued that these changes had come too late and did not go far enough.

This most recent claim is still under consideration and debate even though a report has been issued by the Waitangi Tribunal (2019). This follows the adjournment of an initial inquiry enabling the Crown and the Freshwater Iwi Leaders Group the opportunity to co-design reforms to address Māori rights and interests in fresh water. In its latest Stage 2 report, the Tribunal found that whilst the Crown "deserves credit" for work carried out to develop a better national framework for freshwater management, the present law in respect of fresh water is not consistent with Treaty principles. It has been suggested that "the recommendations made by the Tribunal, whilst being non-binding, are framed in strong terms and will need careful consideration" (Phillips & Rego, 2019).

Te ao Māori concepts embedded into The National Policy Statement for Freshwater Management

The National Policy Statement for Freshwater Management 2014 (amended 2017) states that the matter of national significance to which this national policy statement applies is the management of fresh water through a framework that considers and recognises Te Mana o te Wai as an integral part of freshwater management. It explains this as follows:

"Te Mana o te Wai is the integrated and holistic well-being of a freshwater body. Upholding Te Mana o te Wai acknowledges and protects the mauri of the water."

³ See next sub-section for more details on Te Mana o te Wai and its relationship with the NPSFM.

This requires that in using water you must also provide for Te Hauora o te Taiao (the health of the environment), Te Hauora o te Wai (the health of the waterbody) and Te Hauora o te Tangata (the health of the people). Te Mana o te Wai incorporates the values of tangata whenua and the wider community in relation to each water body. The engagement promoted by Te Mana o te Wai will help the community, including tangata whenua, and regional councils develop tailored responses to freshwater management that work within their region.” (National Policy Statement for Freshwater Management 2014 (amended 2017), 2017)

The latest consultation (*Draft National Policy Statement for Freshwater Management 2019*, 2019) further highlights the importance of Te Mana o te Wai by featuring:

- the principles of mana whakahaere/governance, kaitiakitanga/stewardship and manaakitanga/respect and care;
- the hierarchy of obligations – to waterbodies first, then to the essential needs of people, and finally for other uses.

The goal here is to give effect to Te Mana o te Wai by including the following:

- providing for the involvement of iwi and hapū in freshwater management and identifying and reflecting tangata whenua values and interests;
- engaging with tangata whenua and communities to identify matters that are important to them in respect of waterbodies and their catchments;
- enabling the application of broader systems of values and knowledge, such as mātauranga Māori, to the health and wellbeing of waterbodies and freshwater ecosystems;
- adopting an integrated approach, ki uta ki tai, to the management of waterbodies and freshwater ecosystems.

Furthermore, the intent here is for every regional council to mandatorily include the following objective (or words to the same effect) in its regional policy statement:

“The management of freshwater in our region must be carried out in a manner that gives effect to Te Mana o te Wai, as it is described in the National Policy Statement for Freshwater Management 2019 and understood locally.”

As part of the requirement to give effect to Te Mana o te Wai, under this new regime regional councils must engage with tangata whenua in the management of waterbodies and freshwater ecosystems, including involvement of tangata whenua in freshwater management and decision-making, and identifying tangata whenua values and interests.

Although the above concepts have yet to be fully incorporated in the NPSFM, it highlights the direction of thinking and the intended course of contemporary practice.

Commercial (non-farming) interests in water

The primary concern in New Zealand over commercial interests in water relates to the establishment of water bottling plants by overseas based companies. Chung (2019), in giving the example of Nongfu Springs (a Chinese company wanting to establish a bottling plant in Otakiri, east

of Whangarei), observes that such corporates export and sell their products at considerable profit to overseas consumers since they pay little or no extraction fees. Reasons for concern are therefore cited as being (Chung, 2019):

1. consumers are angry that they are paying more for water consumption than corporates,
2. Māori are concerned their rights to water are being undermined,
3. environmentalists are concerned for the health of aquifers, the pollution of waterways, as well as plastic pollution.
4. in a world where climate change is driving increased water scarcity, one could ask why New Zealand is giving away its precious fresh water resources for free.

Taylor and Cruickshank (2005) point out that it is not just overseas corporates involved in this business. For example, one of the first indigenous brands in the world – Kono NZ LP - is now being used by the Wakatu Incorporation to sell their fruit, seafood, wine and spring water products. Its very name has some relevance as it might be interpreted as meaning “Hua a te whenua me te moana” - our gifts from the land and sea. According to its owners, the business model has been developed under a strict and comprehensive cultural process, with the express intention of allowing other Māori groups to use the brand, under certain controls, by leveraging on their brand equity and relationships but with each brand being developed and controlled by a company or business.

The rationale of charging however flies in the face of common law, since ownership of water is not possible in New Zealand because, according to (Daly, 2019), it is defined as a “public good”. This has been used to explain why water extraction itself is free, with residents only paying the costs of infrastructure which delivers water to their homes, thus making it difficult to justify applying royalties to commercial water users.

Therefore, the key question here is whether or not royalties or other fees should be paid for its access, and if so to whom should this be paid. The current government’s position is that a charge on exported water is likely but not guaranteed this term (Daly, 2019). Trade and Export Growth Minister David Parker has stated that such a charge would likely come in the form of a tax or royalty on bottled water, and would include a charge on water sold in New Zealand and overseas at an estimated rate of approximately one or two cents a litre.

Regardless of any royalty that may or may not apply in the future, a consenting process will always need to be undertaken in accordance with information contained elsewhere in this report.

Water trading

The level of transferability, i.e. the ability of a water consent to be traded separately from the land (refer to Table 1), is perhaps the most critical aspect to be considered when conducting a rural valuation assessment. It goes to the heart of the issue as the level of tradability of a water right determines the extent to which a right to fresh water right might be implied as a component of the land value component. Reed (2007) suggests that regardless, the existence of a trading market for water rights should be acknowledged in the valuation. Whilst there is a need for up to date research in this area, Harris Consulting (2003) established that whilst there may not be a significant mismatch between consent holders' understanding of their rights and an objective assessment of these property rights, minor differences did exist at that time in respect of transferability. Although community attitudes have no doubt changed since their assessment, they did make a number of compelling observations by establishing that:

- The quality of title is the most affected of how property rights are working in terms of water consents. This is associated with lack of specification of the resource from which the water was drawn, which creates uncertainty over future access.
- Transferability was the main area where there was a mismatch between consent holder's understanding and the real situation. Despite most councils having policies which allowed or encouraged transfer, it was found that many farmers believed that this was not allowed or did not approve of the practice except where land ownership changed.

There is evidence that the situation is changing whereby there are greater opportunities for trading. This may be partly in response to a greater understanding of parameters surrounding the local "rules", and perhaps a cultural change that finds the practice of water trading more acceptable.

Commentary under sub-section "Water Permits" in this report has indicated that under current RMA regulations, water permits are not automatically transferred when land is sold. However, it is possible that this may occur if approval is given by the consenting authority - and indeed is very likely where the transfer is made to another site (or person) in the same catchment.

Table 1 - Characteristics of water property rights (adapted from Harris Consulting, 2003 and the author's own unpublished resources)

Characteristic	Definition	Comment
Flexibility	The extent to which the owner can change the mode or purpose of resource use without forfeiting the right	Examples include tying consents to application rates and land use – this constrains flexibility and productivity
Divisibility	The ability to create joint ownership, to divide the asset spatially or by function, to construct temporal succession of rights	Community schemes typically operate under a divisible consent.
Quality of title	Enforceability, certainty, security, ease of establishing ownership	Defines how secure a property holder can be assured that the specified property will continue to be available in the future. Issues such as changes in the resource and pressures from other stakeholders may affect the security that consent holders hold in relation to the quality of their title
Exclusivity	Specificity, excludability, how many other parties to agree with on use	Relates to unauthorised takes and other consent holders exceeding their consent conditions
Duration	Permanence, length and arrangements for renewal	Length of consent and potential for renewal
Transferability	Assignability, exchangeability, tradability	While consents are typically traded with the land, can it be transferred separately from the land?
<i>Note: the above categories are not completely independent or exclusive</i>		

Industry Peak Bodies and other stakeholders

A number of industry peak bodies have strong vested interests in New Zealand's fresh water regime.

For example, Federated Farmers indicated in their submission to The Ministry for the Environment, (Submission on: Clean Water – Consultation Document) that they are supportive of a number of initiatives being proposed to change the way in which water is managed within New Zealand (Allen & Begley, 2017). This included their support for the provision of better quality information, use of certain tools to monitor ecosystem health, and an explicit requirement to consider economic aspects in water management decision-making. On the other hand, they are sceptical of nutrient monitoring capability, and the decision-making processes surrounding Te Mana o te Wai, as well as the regulation of stock access to waterways.

Federated Farmers are particularly concerned about the costs of implementation and the way in which these costs might be shared. In this regards they maintain that whilst both urban and rural contribute to problems involved in managing complex ecosystems like freshwater, there is nonetheless a need to recognise that farming and the agricultural industry as a whole is an important component to the economic wellbeing of New Zealand (Allen & Begley, 2017). In so doing they argue more widespread economic responsibility.

Fish and Game New Zealand see that they play a major role in protecting the habitat of sports fish and game birds, a role which includes lobbying for appropriate environmental policies, developing and enhancing wetlands, providing advice, advocating for clean water and environmentally sustainable farming practices. Fish & Game New Zealand also have strong views on water quality, availability, and ownership. For example, they agreed with conclusions reached by Palmer (2013), with regards the Clutha Development (Clyde Dam) Empowering Act 1982 to grant water rights to the Crown in respect of the operation of the Clyde Dam on the Clutha River. He observed that this kind of legislation “did not sit well with New Zealanders’ fundamental sense of fair play and therefore after an election the Government was defeated”. Accordingly, over the years such proposals (and others like this) to amend the RMA in this way have been typically thwarted.

Forest & Bird are another significant stakeholder in NZ water. They are a conservation organisation, having a particular concern regarding the effects of pollution on freshwater ecosystems. According to their website, they are “an independent conservation charity who for more than 90 years has worked to protect New Zealand's wildlife and wild places” (Forest & Bird, 2018). They see that New Zealand's waterways are in crisis. Forest and Bird believe that New Zealand's rivers, lakes, and streams are being polluted and too much water is being taken from them, and that the major driver of this freshwater crisis is intensive agriculture. They also state that the situation is being made worse by climate change and increasing droughts, which reduce river flows and intensify the pollution. Problems of high bacterial levels and toxic algal blooms exacerbate problems relating to the survival of NZ's freshwater fish, insects and plants, all of which they state as being under threat.

Other organisations having varying levels of influence include the Freshwater Sciences Society, The Hydrological Society of New Zealand, Land Air Water Aotearoa and the Land and Water Forum, and a collaboration between University of Canterbury and Lincoln University to address freshwater management - The Waterways Centre for Freshwater Management, opened in 2010.

Implications for Valuers and other property professionals in undertaking valuation appraisals and advisory roles.

Valuation principles

The legal right to water is as important to the value of a property as the physical source of the water. However, water rights vary affecting the level of access to water and therefore the long-term dependability (and cost of adequate drainage) and water supplies) should always be analysed. This may require special expertise (Reed, 2007).

Because of modern-day inherent ownership disparities relating to water and / or water rights on any given property, Valuers need to be very cautious and avoid ascribing any special value to an owner over and above the “fair” open market value. As indicated by Brown (1972), such matters may have particular relevance when the assessment of compensation is being undertaken in the case of disposed owners – but the idea that market value is the same thing as the value of the land to an owner is a notion outmoded since the nineteenth century.

Highest & Best Use still applies

Professional, registered Valuers understand that the primary determinate in estimating market value is to determine the highest and best use of the property. Highest and best use is defined in the standards as ‘... **the use of an asset that maximises its potential and that is possible, legally permissible and financially feasible.**’

The Market Value of an asset will reflect its highest and best use. The highest and best use is the use of an asset that maximises its potential and that is possible, legally permissible and financially feasible (S30.4 - IVSC, 2019)

“Highest and best” is the one potential use that is more likely than others: a bona fide sale occurring under market conditions ought to reflect highest and best use. The highest and best use is now more tightly defined as

*“the **most probable use** of a property which is physically possible, appropriately justified, legally permissible, financially feasible, and which results in the highest value of the property being valued”*

In practice, the most probable use is defined as:

“Market Value is the most probable price reasonably obtainable in the market on the valuation date in keeping with the market value definition. It is the best price reasonably obtainable by the seller and the most advantageous price reasonably obtainable by the buyer” (S30.2 - IVSC, 2019).

*“That alternative course of action which is closest to being the **most fitting use** while recognising strong constraints imposed by current political forces, real-estate technology, the personalities and talents responsible, the money market, and short-term solvency pressures on consumer, producer and public infrastructure”*

One definition of “the most fitting use” is:

“an optimal reconciliation of affected consumer demands, the cost of production, the cost of infrastructure services, and the fiscal and environmental impact on third parties”

Water rights may have a significant impact on market value, since if water rights do not transfer with the land, the property’s value may decline significantly and its highest and best use may be changed (Reed, 2007). In addition, as pointed out by Barron and Sorensen (2015) evolving rules governed under the Resource Management Act and obligations conferred by application of the NPSFW may restrict or eliminate land use options unless resource consents are obtained and complied with. Clearly, this is strongly related to the “legally permissible” element, and therefore by default, highest and best (or most probable) use. It also strongly relates to the more contemporary definitions provided under “most probable” or “most fitting” use.

Of course, it is important to recognise that the existing use of land may not necessarily represent the highest and best use of the land, and the land could have a higher value for alternative agricultural uses. An example of this might be dry grazing land which has access to water rights for irrigation purposes for cropping land.

Section 3.1 of a recent Technical Information Paper on the “Market Value of Rural and Agribusiness Properties” (API & PINZ, 2018) also discusses what is termed the “In Use” value⁴ for rural property as being that which “reflects the market value of the real estate component inclusive of purpose built structural improvements, and fixed essential plant and equipment that form part of the existing operational use. It may also include the value of any water rights that enable the property to operate at the value level”. However, because of a rapidly changing regulatory environment, S3.6 (API & PINZ, 2018) cautions as follows:

“Within New Zealand the changing environmental and water policies being implemented may alter the current or future land use and, in some situations, prevent the existing land use, even if it is the current the highest and best use, from being undertaken. Valuation reports should raise these issues and the likely impact policy changes will have on the use of the land, its productivity and value”.

Irrigated and other specialised farmland valuations

The API & PINZ (2018) regard certain properties as being intensive or specialised. This includes a number of property types that integrally involve assessment of water rights. For instance, aside from the most obvious being irrigated properties, these include vineyards, orchards, dairy farms, and others.

These specialised properties might be considered in the light of the valuation methodological principles involved when valuing irrigated properties. When valuing irrigated farmlands, like other specialised properties mentioned, it is possible to use productive methodology. However, when this is used a cross check with a suitable alternate method should always be undertaken. The most likely alternative would be based on the “irrigated hectare value” or its equivalent. In undertaking this methodology:

⁴ API & PINZ (2018) describes the “in use” value as being distinct from a “going concern” value assessment which may include nonfixed plant and equipment, and/or business goodwill plus other tangible and intangible assets.

1. If irrigation equipment is “fixed” (i.e. not chattels), then provided sales analysis are equivalent you are able to use irrigated hectare value including fixed improvements on the irrigated portion
1. Improvements may include: Reservoirs, dams., bores wells, Grading levelling and banking, channels, ditches, bridges, culverts, underground pipelines, and other fixed installations and pump equipment
2. Plant includes: Portable piping / spray lines, other portable items; plant and equipment used as sprinkler system
3. Be careful to separate out *non irrigated* portions
4. Be aware that one method of valuation may not work in another area

Possible examples of “irrigated hectare values” might include:

- One hectare of cleared land, graded, ditched, check-banked, drained and properly prepared (adjusted for sub-standard improvements)
- Cleared hectare value – irrigated improvements excluded from hectare \$ value
- Planted and irrigated hectare value (where the nature of forestry or other plants may be taken into account)

Much will depend upon the way in which the sales analysis has been conducted, and of course the level of comparability with the subject. There may also be a need to “split” valuations in the case of mixed farms, e.g. pastoral / cropping; grazing / dairy; grain production / stock finishing; etc.

Good irrigation planning involves an understanding of required application rates for primary products, and likely soil infiltration rates (Trafford & Trafford, 2011)⁵. Slope of the area, plant cover and soil surface characteristics all contribute to the total volume ideally applied. Valuers would do well to have at least a modicum of knowledge in this area too. Some understanding as to as to how these factors might be taken into account (and ideally the ability to calculate or comprehend the output of a daily water budget) is fundamental in assessing the likely effectiveness of the on-farm system employed.

Nutrient and other regulations – what is expected of the Valuer?

In overall terms, the Valuer will need to determine whether or not the land use being conducted and its intensity, along with the general management of the property, complies with regulations having application to the particular district, locality or region. Most Council provide information maps on their websites to assist in determining what might apply in any given circumstance. As pointed out by Barron and Sorensen (2015), it may be that what did not require resource consent previously now does. It is therefore obvious that Valuers need to have a good understanding as to the extent to which management decisions have been made by land owners around stocking rate, feed and fertiliser inputs among other things in order to comply with regulations.

Therefore, compliance with a resource consent often involves a check as to what regulations might apply in a given circumstance - but there is currently a special emphasis currently with regards nutrient control. Whilst the level of emphasis varies from region to region, there is typically a specified level of nitrogen leachate allowed based on results from, in most cases, output from an

⁵ This publication and its later updates also provide comprehensive details concerning irrigation unit measurements, irrigation scheduling and resource consent applications. Costings analysis Including infrastructure, capital works and supply costs are also covered in a companion publication Askin and Askin (2016)

Overseer model⁶. These results are also often contained in a Farm Management Plan which may be a mandatory document requiring submission to the local Council in order to allow a particular land use or land use intensity. Some regional councils have fully implemented this requirement, and others are allowing a period of grace for periods up to ten years' time enabling a more gradual phasing in of the requirements. A "generic" but comprehensive checklist of activities to be undertaken by the Valuer in order to determine compliance is located at Table 2.

The foregoing may well have caught some farmers, perhaps dryland farmers in particular, unawares. Irrespective, there has been new interest and meaning in assessing the nature of soils especially with regards ability to hold nutrients and associated level of potential intensity. Some types of properties, e.g. border dyke and dairy support land, may also exhibit typically higher baselines which will be very important information for existing and prospective investors.

All this may mean that there are less development opportunities, and a higher risk for the investor, all of which is relevant to the land valuation process. For example, the market may consider it safer to buy an existing developed farm, even where new irrigation schemes are established since they will inevitably be constrained by nutrient regulations.

Barron and Sorensen (2015) therefore rightly encourages, thorough due diligence, a determination as to whether the land use activities and management systems for the property will be "feasible, legally permissible and financially viable". We therefore come back to the matter of "highest and best use". Moreover, it is therefore clearly incumbent that those stakeholders associated with rural property, especially Valuers, demonstrate a sound understanding of information relating to a property's compliance of the Resource Management Act and regional council rules.

Taking water allocations and / or availability into account

Water allocation – part of the real estate component, or split from the farm entity?

The Valuer needs to determine the status of any resource consent (i.e. in this case, water permit) that may have issued, and the identity of the consent holder. This is because water permits are generally needed when taking water for irrigation or similar purposes (including the taking, damming using or diversion of surface or ground water). However, it should be noted that the taking water from surface or groundwater may be 'permitted' in which case no special permission or resource consent is therefore required.

The Environment Foundation (2014) suggest that it can be determined that a transfer has effect when written notice of the transfer is given to the consent authority in accordance with "Form 11 - Application for transfer of water permit or discharge permit" 2018). They indicate that many local authorities have prepared their own forms for notice of transfer of consents, and are usually available from local authority websites.

⁶ Not without its critics, Overseer® is a computer model that calculates and estimates the nutrient flows in a productive farming system and identifies risk for environmental impacts through nutrient loss, including run off and leaching, and greenhouse gas emissions. It came into common use in New Zealand 2012/13 and it reports N loss via leaching, runoff and direct deposition as 'N loss to water'. It is the primary tool recognised by many Councils in NZ for estimating nitrate leaching losses from the root zone across the diversity and complexity of farming systems.

Value of improvements dependant or constrained by availability of water

Overall, contemporary thinking places a water resource or right to use the water held by a farming enterprise as being personal property and, in many cases, can be sold separately from the land. This should be considered in the valuation. As pointed out by (API & PINZ, 2018), water can comprise a significant element of value of an agricultural property, and in some areas, if the water component is removed, the property may not be even viable for dry land production.

Table 2 - Tasks required of a rural Valuer under the new regulatory regime in New Zealand (adapted from source: Barron & Sorensen, 2015)

Task	Source
Identify the regional council the property is under	Maps in a regional council website.
Identify in which fresh water management unit the property is situated	Regional council website. A useful catchment website is provided by LAWA (2020) which outlines catchments with some nitrogen, phosphorous and other quality measures and trends.
Obtain copy of regional plan rules	Regional council website. We recommend you print off and separate out the rules, interpretation, schedules and maps. The rules often refer to these and it makes it so much easier to follow.
Identify activities on the farm	When inspecting the property think of the activities required under your assessed highest and best land use. When you are back in the office check the rules, both operative and notified, until you become familiar with them. Examples of common rural activities that need consideration include land use, dams, reasonable allowance for domestic and stock drinking water (surface and ground water), and Irrigation including surface and groundwater takes and meters.
Calculate land use capability limits	Calculation methodology will be in the rules if applicable.
Compare with nutrient budget in an Overseer report	Get this from the property owner. If land use is different from the highest and best land use you will need to get new nutrient budget modelling done. Needs to be done by a certified Overseer technician.
Determine if resource consents required	Check with rules or contact regional council.
Obtain copy of resource consents	From the regional council. Understand terms and conditions and determine if highest and best land use complies.
Obtain other information	Nutrient budget, farm environment management plan, phosphorous management plan from property owner. Check to see if Overseer reports have been completed by a certified technician. You will need to have a good understanding of these reports and how they affect the subject property.

Furthermore, it is important that Valuers understand the difference between the temporary (allocation) market, and the permanent (entitlement) market, along with understanding adequacy of water volumes and flow rates to support the land use being assessed. Associated with this is a determination as to whether Resource Consent take and/or volume is adequate to meet peak water requirement of the land use (API & PINZ, 2018). Moreover, Valuers should consider whether the subject property has legal access to sufficient water to sustain current operations on a year in year out basis. If not (especially if water is sourced from a neighbouring property with no formal arrangement), then this issue should be clearly addressed within the critical assumptions.

Water as a component of the sale price – market value vs in situ

Traditionally, there has always been significant debate as to whether the added value of water as being integral to the sale price. Baxter and Cohen (2009) observe that whereas water was once part of the land and “ran with it”, in recent decades governments in both Australia and New Zealand have “unbundled” water rights and allowed their sale and lease as a separate commodity. As a result, in many instances irrigation water will be treated as a stand-alone asset.

The key issue for a Valuer is to determine what is the added value of water as a component of sale price. This may not always be easy to determine because there is often a lack of transparency with regards to information on water transactions. Regardless, it is critical that there is absolute comparability between the subject and those properties being offered up as evidence, even if this means that additional calculations need to be made. The Valuer is always on safe ground so long as any assumptions are clearly made, and appropriately highlighted in the report.

Baxter and Cohen (2009) also emphasise the need to consider market value versus in-situ value, in particular the treatment of the added value of improvements especially where they are dependent on specified water allocations. This has perhaps greatest relevance to the valuation of irrigated properties where the creation of legal and financial interests as a result of water allocation has become patently clear. Deregulation of water markets also has serious implications for valuation practice. Overall, then, the Valuer needs to undertake a comparison of water allocation relative to the whole area of the property in order to make comparisons. As explained by Baxter and Cohen (2009):

“Once the basics of irrigation and water ownership are understood, the balance of the valuation process is similar to that which might be adopted for grazing land. The essence is that sales analysis to be able to compare like with like”.

Any additional information available in relation to irrigation properties simply mean that the value attributes are just a little more complex and require additional analysis. In addition, sales evidence may contain examples where water was sold off separately whereby a value for the water required to sustain improvements and land uses undertaken can be established and noted in the valuation as a chattel. Appropriate comments might also be made in such instances indicating the degree to which the subject property is required to sustain the farming entity and the diminishment of value that might apply if such improvements were absent.

In summary, sales analysis considered should take into account any differences between water or irrigation rights of properties analysed in comparison to the subject property. The existence of specific factors which may impact on the value of agricultural land, may or may not be reflected by the prices paid for comparable properties. Valuation calculations should also fully disclose the value of any water access or entitlements, which should be separately identified in such calculations.

Transferability

Baxter and Cohen (2009) provide some general but useful guidance on the matter of transferability. It is important that this aspect is carefully considered, as it may alter the viability of a particular land parcel, depending on how much water is retained, compared to the productive needs and the land's capability. In particular the Valuer needs to take great care to ascertain the water rights available to both the sale and subject properties, and transferred as part of a sale, or alternatively purchased to replace what might have been sold separately or transferred elsewhere.

The apportionment of the foregoing may be achieved by establishing the total water allocation as a percentage of the property, thereby taking into account land either unsuited or unavailable to irrigation. This is especially significant in areas like Canterbury where new allocations are either not being approved, nor automatically transferred (in the case of existing allocations) or even partly surrendered, where ownership changes are proposed.

Qualifications and disclaimers

A comprehensive set of disclaimer clause and qualification statements may be found in API & PINZ (2012). Valuers attention is drawn here to a number of issues that require explanation or clarification. In overall terms and in accordance with S1.7 (API & PINZ, 2012), it is always important that Valuers include those qualification statements in a property report that bring to the attention of the reader any assumptions and/or other issues concerning factors which might affect the property, and ultimately its value and any other conclusions in the report. There is a clear mandate here, in terms of water rights.

An increased awareness of environmental issues in the community today has brought about a need for Valuers reporting on property to be conscious of influences which may affect the value of a particular property at the time of reporting or at some time in the future. Those issues obviously include nutrient management for properties adjacent to rivers/ streams or over underground water supply sources.

However, arguably the most critical factor for Valuers is their determination of "highest and best use," and the establishment of whether resource consents are required. There are three possibilities here:

1. If resource consent(s) are required but not yet issued, a determination as to whether the market evidence supports assumptions made should be undertaken
2. Consider if a consent is probable - and qualify your valuation report accordingly
3. If resource consents are known and compliance appears in evidence, state this in the report.

It is very important that the current environmental framework applicable for a particular subject property should be flagged to the user of the report. In this way, any risks associated with the property and its potential effect on market value will be highlighted. Any uncertainty surrounding possible / probable future rules, in addition to those rules known but not yet having effect, together with market reaction, might also be commented on and the Valuers report qualified accordingly.

Glossary of Terms

Table 3 - Glossary of Māori terms and their meanings as expressed in this report

Māori term	Meaning as articulated in this report
Hapū	Subtribe, clan, or section of a large clan or kinship group (Barlow, 1991; Mead, 2016)
Iwi	Larger, tribal group; extrapolated from Barlow (1991) and Mead (2016) as literally referring to the “bones” representing a tribal or social group
Kaitiaki	Environmental guardian, trustee
Kaitiakitanga	Guardianship, stewardship, trusteeship
Kaumātua	An elderly adult of status (man or woman)
Kāwanatanga	Governmental authority, often contextualised in terms of the governorship of New Zealand but can have a more narrow or regional focus
Mana whenua	Local Māori, and the power associated with occupation and custody of tribal land
Mātauranga	Modern term representing the corpus of intellectual knowledge or wisdom, both historic and contemporary, a term often associated or used in conjunction with Māori
Mauri	Power of the gods, or “life-force”. Only mauri can bind the two parts of a being (body and spirit) together
Moana	Ocean or large lake
Pākehā	Non-Māori person or foreigner living in Aotearoa / New Zealand, typically English speaking and of European origin. Moorfield (2017) refers to Pākehā as being a New Zealander of European descent originally applied to English-speaking Europeans living in Aotearoa/New Zealand.
Rāhui	Localised ban or restriction
Rangatiratanga	Chiefly autonomy or authority, sometimes referring to a sovereign realm or kingdom
Tāngata whenua	Local indigenous people of the land.
Taonga	Prized possessions or treasures – or as described by Mead (2016) a cultural treasure of some kind.

Māori term	Meaning as articulated in this report
Tapu	A supernatural restriction, possibly sacred in nature, which may be associated with a person, place or thing, usually linked with mana. Various definitions of tapu proffered include “the state of being set apart” ((Mead, 2016); “sacred, set part...the power and influence of the gods” (Barlow, 1991); “sacred things” (Mead & Grove, 2001); and “sacred” (Stafford, 1997)
Te ao Māori	Māori world-view, sometimes expressed as tiro ā-Māori ki tōna ake ao, focusses on the interconnectedness and interrelationship of all living & non-living things and the kaitiakitanga responsibilities of Māori (in this paper the guardianship of resources for future generations is given specific attention)
Tiriti o Waitangi	the Treaty of Waitangi
Tikanga	Appropriate cultural practices, protocols and customs
Tino rangatiratanga	Absolute sovereignty and autonomy typically achieved by self-determination and / or self-government. Barlow (1991) suggests that the term tino rangatiratanga was incorrectly coined by colonists who suppressed Māori sovereignty, with the term “arikitanga” being a more acceptable alternative since that was coined centuries ago by Māori in reference to their supreme power and authority.
Wai	Water – often used in relation to a creek, stream or river
Whakapapa	A holistic ecosystem paradigm involving the interconnection and relationships between physical and metaphysical objects. In its simplest form this might refer, for example, to genealogy.
Whānau	Extended family group. Barlow (1991) and Mead (2016) suggest it references household units or close relationships of extended family
Whenua	Land or earth. Deeper meanings literally translate as placenta or afterbirth.

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About the Foundation

The Valuer's Education and Integrity Foundation (VEIF) was formed in 2016 and is a registered charitable trust with full tax deductibility.

- The Foundation is an independent New Zealand registered Charitable Trust whose core objective is research and where the principle purpose is advancing education in the field of valuation in a manner that meets our charitable objectives and has a public benefit.
- The Foundations aims to commission, fund and resource quality and robust research and educational material within the scope of property valuation and property related issues. The intention is for research outputs to be of practical use with a focus on current or emerging property and valuation issues, to develop new methods and critical thinking and to fill knowledge gaps.
- The Foundation will consider applications for funding from individuals, groups and institutions and is willing to consider co-funding projects and support larger research projects with other organisations, whether they are professional bodies, other charities and private sector organisations or individuals.

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This research was proudly funded by:



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