



***Feasibility Study of the Manuherikia Catchment to
Provide Water Storage and Distribution for Irrigation in
the Manuherikia Catchment***

REQUEST for PROPOSAL

May 2013

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1. INTRODUCTION

The Manuherikia Catchment Water Strategy Group (MCWSG) was formed to allow the community (residents, rural and urban, and the ratepayers) to develop and oversee the implementation of a water strategy for the catchment to identify the most cost effective, efficient and sustainable options for irrigation and water users in the Manuherikia Catchment. The MCWSG is a representative group of farmers, irrigators, and community interest groups, and operates under the umbrella of the Central Otago District Council (CODC) for contractual matters. In this case the CODC will be the contract holder with the successful Respondent or Respondents.

The community's long-term goal is to increase prosperity and well-being within the region and to encourage sustainable relationship with the land. Prosperity and wellbeing in the catchment is inextricably linked to land and water. It is generally believed that constraints on reliable water availability are one factor, constraining improved productivity, along with a need for improvements in the way we take, use and discharge water.

The Central Otago Long Term Plan 2012-2022 (LTP) is the fundamental planning document which underlies the direction that the community intends to follow for the period of the plan, and sets out high level goals for the community. Respondents are encouraged to be familiar with this document which is available on the Central Otago District Council Website, www.codc.govt.nz. The LTP notes amongst other things;

- For people making a living off the land, access to water is their lifeline;
- The capturing, storage and wise use of water has been fundamental to the development of Central Otago from our gold mining heritage, through the establishment of pioneering irrigation schemes in the 1920s to the construction of hydro schemes in the late twentieth century. As we strive to be more efficient in our use of this valuable resource, the future of water storage is important now as it was 100 years ago.
- Council has a hand in ensuring the sustainable management of our natural and physical resources.
- There is greater expectation on Council to deliver sustainable, cleaner and greener environmental outcomes. Moving forward the theme will be a careful balancing of Central Otago's economic and environmental interests.

The LTP also identifies three key community outcomes;

- Thriving Economy
- Sustainable Environment
 - *Water – Ensuring there is an appropriate allocation of water for irrigation while ensuring sustainable waterways. Provide certainty in the quality and availability of residential water supplies, as well as education on water conservation.*
 - *Managing Development Impacts on Landscape and Natural Ecosystems – Understand and protect the inherent values of our landscape and natural ecosystems while having well defined areas of growth.*
- Safe and Healthy Community

The MCWSG has completed a High Level Overview Study that investigated the catchment’s water supply and potential demand and a Prefeasibility Study that considered infrastructure development options for the catchment. The studies showed that the catchment was not water short and that there are promising options that could increase the reliability of the current irrigated area or potentially increase the total area of irrigated land from approximately 15,000 hectares to 35,000 hectares. Figure 1 shows the potential irrigable land within the Catchment.

Following community-wide consultation by the MCWSG, a Community Proposition has been developed. It builds a consensus on rural water use in the catchment, and will be used as a basis for continued engagement with the community throughout the length of the project.

The next body of work is the full *Feasibility Study* which is designed to evaluate five investment opportunities for the catchment and to provide detailed technical information, including assessment of environmental effects and economic and environmental benefits to the Manuherikia Catchment so that post feasibility study, applications for resource consent can be prepared and submitted to the relevant authorities, and full engineering design work completed alongside the development of a prospectus document. The project study area comprises the Manuherikia Catchment, specifically the Manuherikia Valley and the Ida Valley and into the Wedderburn area of the Maniototo.

The *Feasibility Study* will consider development options recommended in the Pre-Feasibility Study for further investigation.

The five opportunities have been broken into three engineering packages as detailed below;

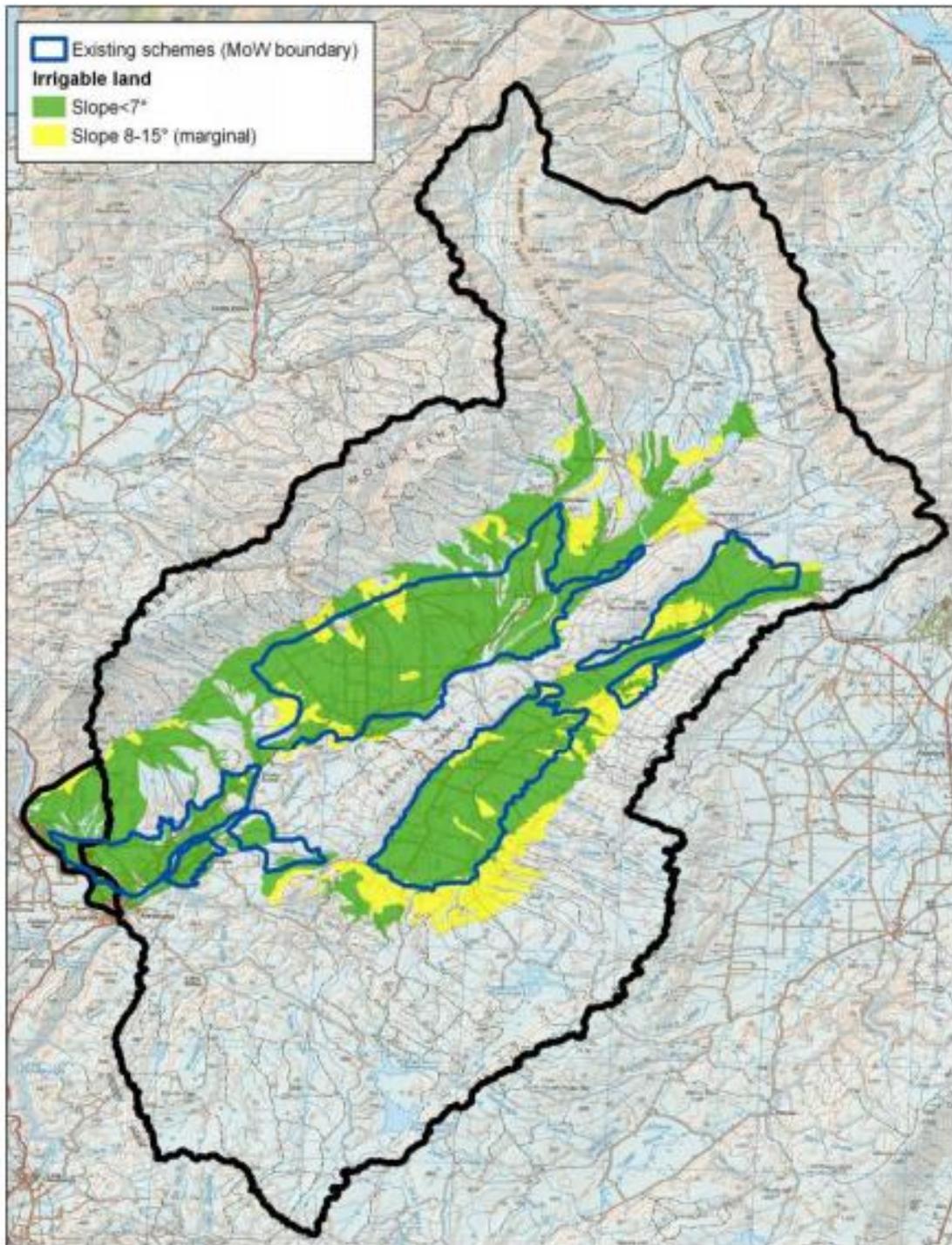
1. [Options 1-3] Investigate the increase in the storage capacity of Falls Dam. Detailed feasibility assessments of raising the top water level by 5 m and 27 m are required. Based on the results, of these two feasibility studies, an interpretive assessment of the issues in intermediate increases of around 8-10m in top water level is also required.
2. [Option 4] Develop design of efficient water distribution systems to deliver high reliability irrigation water supplies from the Falls Dam to meet farm irrigation demands and environmental enhancement water supplies in the Manuherikia Valley.
3. [Option 5] Investigate the construction of the Mt Ida Dam and associated distribution system to serve the northern end of the Ida Valley.

Common to all five options is the completion of work relating to;

- a) Providing economic merit and financial affordability assessments for each investment opportunity.
- b) Providing environmental assessment services for each on the investment opportunities.

The prefeasibility studies and other background information are available to all Respondents and can be found on the project website; www.mcwater.co.nz

Figure 1: Potential Irrigable Land



Potentially irrigable land (slope < 15°, elevation less than 600m, & excluding isolated areas)

Source: Aqualinc Manuherikia Catchment Study Stage 1

1.1 Water Availability

The Manuherikia River has a mean naturalized flow at the Clutha River confluence of 18.5 m³/s or 585 Mm³/y. Irrigation reduces the instantaneous flow by up to 8 m³/s, although averaged over a year and a number of years the reduction is about 2.7 m³/s or 85 Mm³/y. In dry years, irrigation abstraction can reduce instantaneous flows at the confluence to below 1.0 m³/s. Flows in the Manuherikia River are highest from June to November, and lowest in February and March.

Total peak flow rates of water allocated within the Manuherikia catchment is over 27 m³/s and is several times in excess of the water flows available during low flow periods. Actual peak water use is closer to 8 m³/s during periods of peak irrigation demand. Currently, not all water permits specify a seasonal volumetric limit. Actual water use is much less than the consented allocation, because often the consented flow is rarely available. There is no remaining reliable run-of-river water.

1.2 Water Demand

Currently, about 25,000 ha of the Manuherikia catchment is irrigated. Of this 25,000 ha, only about 15,000 ha receive total seasonal water requirements based on peak evapotranspiration. Water scarcity means the remaining 10,000 ha is only occasionally irrigated, in some cases as little as 2-3 times a year.

The current area of irrigation is well short of the potential 60,000 ha of irrigable land identified in the Stage 1 Study. The pre-feasibility studies noted that there is not a shortage of irrigable land; the total water resources of the Manuherikia Catchment, with practicable regulation are capable of meeting irrigation demands of perhaps 40,000 hectares.

The Manuherikia Catchment is water-short in dry years. Water scarcity means it is unlikely the full 60,000 ha of irrigable land could be irrigated with water from the Catchment alone. The availability of reliable water rather than suitable land is a primary constraint on future irrigation development. Other factors are also likely to be a significant constraint, such as the imperative of maintaining high water quality and healthy aquatic ecosystems.

2. BACKGROUND

The Manuherikia River system in Central Otago is a complex and challenging catchment in terms of climate, topography and water management history. The catchment is semi-arid, with a continental type of climate with larger seasonal temperature variations than is common elsewhere in New Zealand.

The 3,000 km² Manuherikia Catchment which encompasses the Manuherikia and Ida Valleys is complex, with six existing irrigation companies, including Omakau Irrigation Company, Blackstone Irrigation Company, Hawkdun/Idaburn Irrigation Company, Ida Valley Irrigation Company, Manuherikia Irrigation Company, and Galloway Irrigation Company. Four of these irrigation companies, Omakau, Manuherikia, Blackstone, and Galloway have shares in a shared storage infrastructure (Falls Dam Company Ltd). In addition there are a number of private irrigators whom have rights to abstract water for irrigation purposes.

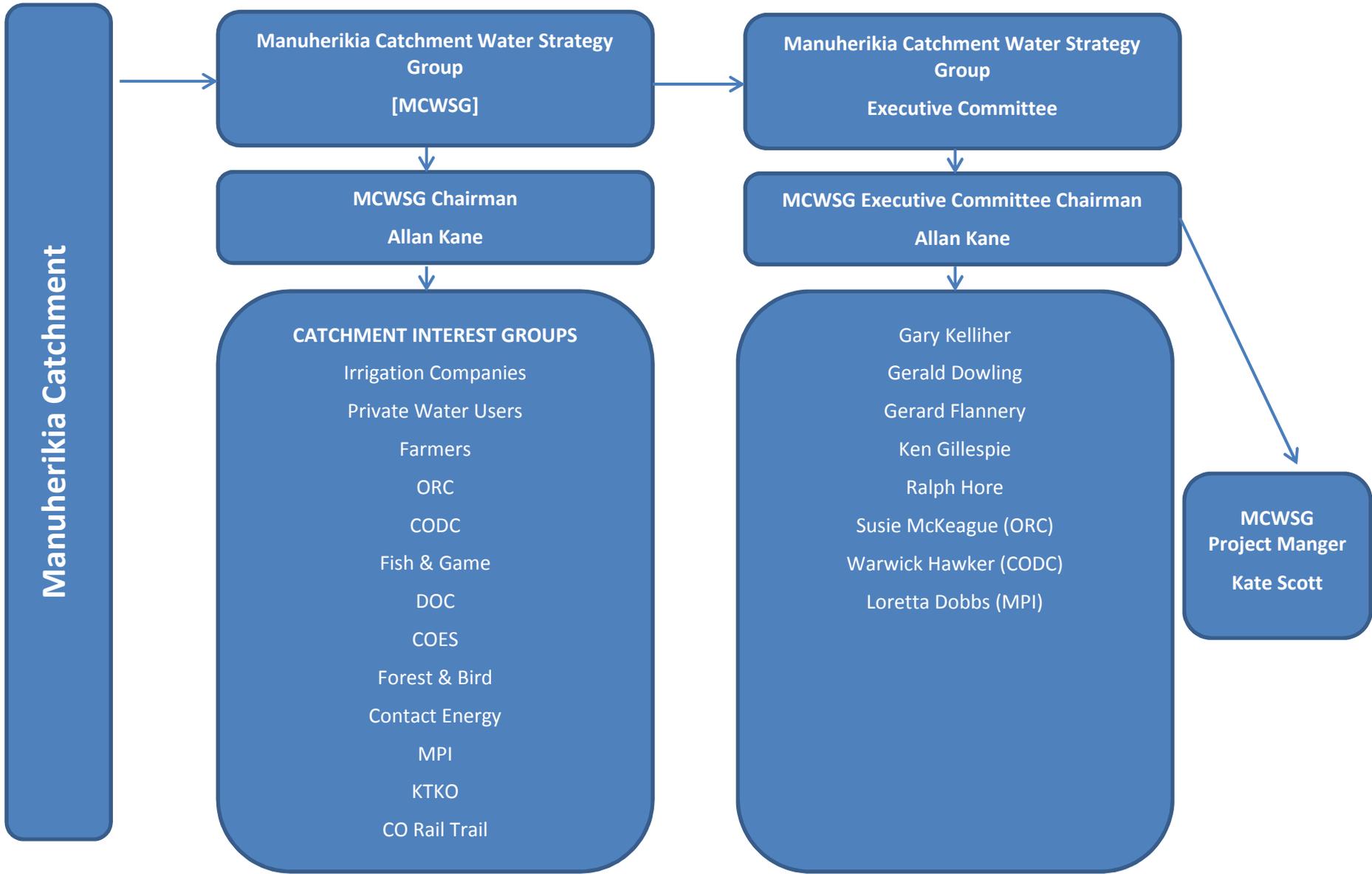
The company schemes date from the 1930's and access to water is primarily based on mining privilege priorities that in turn date from the 19th century, with the exception of the Hawkdun/Idaburn which has a water permit under the Resource Management Act 1991. The infrastructure is aging; irrigation systems are generally of low efficiency and with mining privileges expiring on 1 October 2021 changes and improvements are essential. Significant investment in water infrastructure will be necessary as part of water permit renewals under the current regulatory regime. A major cost maybe remedial work to Falls Dam, which could be required under dam safety regulations to increase the spillway capacity. Any increase in storage capacity will improve supply reliability.

National and Regional policy under the RMA now require higher standards to be adhered to with respect to freshwater management. These include environmental flows and residual flows in watercourses, allocation limits for rate of take and seasonal volume, greater accountability for the quantity of water taken, the requirement to retain or improve water quality and protect aquatic habitats with the setting of limits on discharges back to the environment, and consideration of the proximity of the take to the use location. There is also a requirement to protect important indigenous terrestrial habitat.

2.1 Project Organisation

The Manuherikia Catchment Water Strategy Group (MCWSG) was set up to develop and oversee the implementation of a water strategy for the catchment. Figure 2 outlines the current structure of the groups involved with the project to date.

Figure 2: Project Structure



The relevant organisations and groups shown in Figure 2 include:

Manuherikia Catchment Water Strategy Group

The full strategy group includes a range of catchment interest groups, including those identified in Figure 2. These groups together are working towards integrated planning and decision making around the future of water management within the catchment, and are considered to be the collective decision makers in respect to the five investment opportunities.

Manuherikia Catchment Water Strategy Group – Executive Committee

The executive committee has been developed as a small working group of the full strategy group. The executive committee is made up of representatives of the current water users, including the four who make up the Falls Dam Company. The Central Otago District Council (CODC) and the Otago Regional Council (ORC) and the Ministry of Primary Industries (MPI) make up the other members of the executive committee. The purpose of the committee is to facilitate the decision making process.

Farmer Co-operative Irrigation Companies

There are six farmer co-operative irrigation companies operating within the Manuherikia Catchment, including Hawkdun/Idaburn, Omakau, Ida Valley, Blackstone, Manuherikia, and Galloway. The irrigation schemes are based on open race infrastructure, some of which was installed for gold mining and dates back to the 1860s.

Private Water Right Holders

There are also private water users who have gone ahead and undertaken required statutory measures to gain water take permits within the Catchment, and will need to be considered as part of the overall assessment of the Manuherikia Catchment.

Project Manager

The project manager provides administrative and project management support to the MCWSG and more specifically to the Executive Committee to aid in implementing the feasibility study.

2.2 Scope of Feasibility Study

The scope of the feasibility study is to assess technical, environmental, economic, financial, feasibility of the five investment opportunities outlined in Section 1, so that at the completion of the feasibility study applications for regulatory approvals can be prepared and lodged with all relevant bodies, detailed engineering can be carried out, and a prospectus completed for the most favourable option or options.

The feasibility study of each of the investment opportunities [Options 1-5], has been scoped into five major components, which cover the areas which are seen as critical to enabling the community to make decisions on which options are feasible and which they wish to advance to the next stage.

The five technical work components are detailed below, and it is expected that these will form the main sections that are to be tendered upon. The technical work components shall be applied to all engineering options [Options 1-5].

- A) Hydrological Investigations – Does not form part of this tender
- B) Geotechnical and Engineering
- C) Environmental Investigations
- D) Land Tenure, Water Allocation, Planning & RMA Issues
- E) Economic and Commercial Investigations, Scheme Ownership and Management Models

The feasibility study should also consider viable alternative options including the 'Downs Proposal' and 'Home Hills'. The Downs Proposal is a small race with the intake located below the Gorge on the West Back of the dam. Via this option the Downs and Dunstan schemes could be supplemented from Falls Dam Storage. The Home Hills Option would involve the installation of a water pipe from Falls Dam to enable the irrigation of the eastern side of the catchment. Options relating to the utilisation of Dustan Creek high flows and the associated transfer of water via a race from Dunstan Creek to the Omakau Race should also be considered as a method for ensuring efficiency of storage within Falls Dam.

The hydrological investigations will also need to consider that whilst water is going to be extracted from the Manuherikia Catchment, in the case of the Idaburn/Hawkdun options this water will be utilised within the Maniototo (Upper Taieri Catchment).

The investigations and reports that will accompany these studies need to be of sufficient detail and factual basis, and address matters including assessments of alternatives, assessment of effects, and scoping and assessment of effectiveness methods to avoid remedy and/or mitigate effects. It is expected that these reports will form appendices to the Applications for Resource Consents and Assessments of Environmental Effects. It is expected that these reports will be of a standard comparable to that which is required by the Environment Court and would conform to the Court's Code of Conduct.

Respondents should utilise all available data from the previous studies and all technical data which is available from the Otago Regional Council and other sources. We expect that the feasibility studies should build on the information obtained through the pre-feasibility studies rather than covering that information off again.

Section 4 of this RFP document outlines in more detail the specific considerations of the five bodies of work.

Note: Outputs from the components of the project in cases are inter-related, i.e. output from one is picked up or used in another. Respondents are required to make consideration of this when preparing their project plans and timeframes, and shall specify the order that they will carry out the individual components. If a Respondent is not tendering on all components of the work, they shall detail which other outputs they will require to enable completion of their studies.

3. TERMS & CONDITIONS OF RFP

Section 3 sets out the terms and conditions of the RFP. Respondents must state in their response that they have read, understood, and agree to all provisions in this section.

3.1 Closing Date

The RFP closes on **Friday 14th June 2013 at 3pm** however the MCWSG may extend the closing date and time for responses at its sole discretion.

3.2 Schedule

MCWSG's indicative schedule for this RFP is as follows;

Stage	Indicative Date
Request for Proposal Advertised	9 th May 2013
Final day to ask questions on the RFP	By 5pm 4 th June 2013
RFP Closing Date	By 3pm 14 th June 2013
Shortlisted Candidates Identified	28 th June 2013
Presentation & Interview	8 th July 2013

Respondents will be notified of any significant changes to the timetable.

3.3 Submission of Responses

MCWSG reserves the right not to accept the lowest priced, or any, submitted response.

Late responses may be considered only at the discretion of MCWSG.

Faxed responses will not be received. Emailed copies will only be received with arrangement with MCWSG prior to the closing date specified in Section 3.1 above.

Respondents are required to provide the following;

- Covering Letter
- 2 hard copies of the response (1 bound; 1 unbound)
- 2 electronic copies of the response and the pricing schedule (in Word Format and PDF)
- 2 hard copies of the pricing response (separate and sealed from the response)
- Relevant brochures or marketing material may be provided but must be provided as a separate appendix.

All responses are to be addressed as follows;

MCWSG RFP – Feasibility Study

C/- BTW South Limited

Unit 7 Cromtrade

2 McNulty Road

PO Box 302

Cromwell 9342

3.4 Duration of Responses

The terms and conditions of any response submitted must remain valid and open for acceptance for a period of at least 90 days from the closing date (14 June 2013) of the response.

3.5 No Contract

There shall be no binding contract between any Respondent and MCWSG unless and until a written contract is entered into by the Central Otago District Council on behalf of the MCWSG.

3.6 Notification

All respondents will be notified in writing of the outcome of the RFP at the completion of the shortlist and interview process.

3.7 Questions and Answers

All enquiries or correspondence relating to this RFP should be directed in the first instance to the **Project Manager (Kate Scott)** at the following address:

Manuherikia Catchment Water Strategy Group

C/- BTW South Ltd

PO Box 302

Cromwell 9342

Fax: 03 445 0194 or Email: kate@btwsouth.co.nz

All correspondence must be in writing (by letter, fax or email) and will be responded to in writing. MCWSG reserves the right to communicate the correspondence to other Respondents.

In order to provide sufficient time to distribute communications to all respondents, no reply to questions raised and received after the 4th of June 2013, will be made.

3.8 Preparation Costs

MCWSG will not be liable for any costs incurred by Respondents in the preparation of their response to this RFP, including any costs associated with visiting the project area or travelling to attend an interview post closure of the RFP.

3.9 Conditions of Contract

In the event that MCWSG accepts the response price(s) submitted by a Respondent the terms and conditions of the contract shall be negotiated between the parties, including the CODC as the main contracting body.

3.10 Acceptance of Response

MCWSG reserves the right to accept any response in part or in whole, or not to accept any response. MCWSG may also select more than one response to meet the requirements of the feasibility study which may include asking one or more tenderers to work jointly on the project.

3.11 Pricing

Respondents shall present pricing information according to the five work components detailed in this tender, showing the breakdown of pricing for each sub component. Hourly rates are to be provided along with qualifications and experience of the personnel who will carry out each of the tasks, and the time allocated to the tasks. No monthly administration fee will be paid by MCWSG.

Prices shown in the response must be in \$NZ Dollars and pricing must be exclusive of GST.

Please note: YOU MUST deliver your response to the Pricing Section of the RFP in a sealed envelope SEPARATE from the main RFP response document. Where Respondents are providing a digital copy of the RFP response, please supply your pricing schedule or spreadsheet as a SEPARATE file on the CD.

3.12 Pricing Assumptions

Respondents must clearly identify all assumptions which have been made in pricing each component of the tender, clearly stating the reasons for the assumptions being made and the likely price variation should assumptions prove untrue.

3.13 Pricing Exclusions

Respondents must identify any pricing that may be charged by the Respondent in the provision of the services which are NOT included in their tender.

3.14 Supplementary Information

If Respondents wish to provide supplementary information about their company and or the services they provide, i.e. Company Marketing Material, such information should be provided separately to the main tender response.

Respondents may be requested to provide clarification of parts of their response, or to provide additional information. Requests for further information from Respondents will be made in writing.

3.15 Presentation

Respondents who are shortlisted will be required to make a presentation to the evaluation team and attend an interview with the interview panel as part of the evaluation of the responses. The tentative date for presentations and interviews is the 8th July 2013. Respondents will be required to travel to Alexandra, at their own cost to attend the presentation and interview.

3.16 Evaluation Criteria

A “Weighted Attribute” approach, giving weighted value to both quality and price aspects, is to be applied in the evaluation of the proposals received. The following evaluation criteria will be used as a guide only to assessing the Respondents and in determining a shortlist of Respondents:

Table 1: Evaluation Criteria

Weight %	Criteria	Expectation
MANDATORY	Conflicts of Interest	Any potential or actual conflicts of interest are clearly identified and details of how they will be addressed or managed in providing the services. If there are no potential of actual conflicts of interest, this is clearly stated.
20%	Pricing	Value for Money.
20%	Methodology	Methodologies and approach proposed to be used in provision of each of the services being tendered for.

Weight %	Criteria	Expectation
5%	Innovation	The respondent has demonstrated innovation in the provision of services. Innovation may include identified cost savings, level of service, method for delivery of services etc.
20%	Technical Skills	Personnel must demonstrate high levels of competence in each of the services being tendered for. Each individual must be identified within the response and shall not be changes without prior approval of MCWSG.
15%	Resources and Timeframes	Capability and capacity of Respondent to provide the Services in a timely manner. Assessment of these criteria will be based upon the project plan and timeframes submitted by the respondent.
15%	Relevant Experience	Experience of company and its personnel relevant in the provision of each of the services being tendered for.
5%	Understanding of Local Conditions and Context	Respondents demonstrate an understanding of the project area, complexities of the environment, and can provide demonstrated local knowledge.

Each proposal will be evaluated on the basis of its responsiveness to this RFP. A proposal shall be considered unsuitable and shall be rejected at the stage of technical evaluation if it does not respond to important aspects of the RFP as assessed by MCWSG in its sole discretion.

Respondents must provide a written response to the proposal. The proposal must demonstrate how the Respondent can contribute to the provision of the services, and responses will be evaluated based on any innovative methods for undertaking the provision of services.

Respondents must also prepare and submit a project plan and timetable for the provision of the services, including the expected duration of each phase of work, the personnel that will be carrying out the work, details of any field data required to be obtained, the expected timeframes for conducting field work and time to write up reports and findings. MCWSG has an indicative completion date of 30 September 2014, however suggestions from Respondents on alternative completion dates will be considered, including if

necessary an extended completion date. All responses will be evaluated based on the timeframes submitted in the schedule and timetable in accordance with the criteria detailed in Section 3.16.

3.17 Informed Assessment

Respondents shall undertake such investigations and shall be deemed to have undertaken such investigations as are necessary to enable them to make their own decisions and reach their own conclusions in respect of the response submitted and the resources necessary to provide the services.

4. SCOPE OF FEASIBILITY STUDY

4.1 General

The project includes three engineering investment opportunities: increasing the storage capacity of the Falls Dam by raising of the water level – three increments in the raised water level are involved – 5, 27 and 8-10 m; economic and financial services to assess the economic merit and affordability of each; and environmental and social services to identify and address issues of relevance to the resource consenting process.

The three engineering pieces of work will need to be informed by a study of scheme water supply and demand, hydrological characteristics of the catchments involved, and hydrologic aspects related to environmental considerations – the hydrological investigations have been commissioned separately and results will be available for use by other project studies. The brief for the hydrology investigation is included as Annex 1 to this RFP. It is anticipated that some specific hydrologic material may be needed as the studies progress and the project manager will address these needs as they arise. Where respondents believe such information necessary this shall be identified.

Geo-technical information will be needed to inform all of the Falls Dam options; the Mt Ida Dam proposal; and the works involved in new distribution systems and water distribution efficiency upgrade. Respondents will need to assess the adequacy of existing geo-technical information from published material to be made available. Respondents should describe additional geo-technical investigations that are required and present the estimated costs for this work as a separate PC item in their proposals.

Respondents are advised that the investigations must be to demonstrate technical feasibility; acceptable assessments of economic and financial performance; and consentable proposals to address environmental

and social issues acceptable to the wider community whilst enabling the options to be confirmed as consent ready at the completion of this feasibility study.

4.2 Site Investigations

Responses shall detail the nature of any field work that is required to be undertaken in relation to the *Feasibility Study* and should clearly detail this in the work plan/timetable which is required to be submitted with all tender responses.

Where field work may impact upon the normal operation of any of the existing irrigation schemes or private water rights, this work should as far as reasonably practical be scheduled for the non-irrigation season. Respondents shall detail where such work is required so that MCWSG can initiate contact with any affected landowners or irrigation companies. MCWSG does not intend that all communication with affected landowners need be carried out via MCWSG, but that all initial contact and introductions are to ensure continuity of contact with the key stakeholders.

4.3 Hydrological Investigations

These investigations have been commissioned directly and do not form part of this RFP. Hydrological Investigations are required to review water supply reliability and environmental allowances and confirm irrigation water requirements, as well as determining an overall flow regime for the catchment that meets all in-stream environmental requirements. This will involve a detailed catchment wide hydrological analysis. These activities will be carried out by incorporating and building on the scientific knowledge from previous studies and expertise in Otago Regional Council. For the information of contractors responding to this RFP, the detailed brief for the hydrologic investigations are provided in Annex 1 to this RFP.

Work for Tender covered by this RFP

4.4 Geotechnical and Engineering

4.4.1 Geotechnical and Engineering for the Falls and Mt Ida Dam proposals

The geotechnical information gathered should be sufficient to support a decision as to the technical feasibility of each of the dam proposals (Options 1-3 & 5) and to be able to make realistic costs of the civil works involved. The investigation will identify most appropriate type of dams and basic arrangements. The engineering study should develop and optimise the storage dam arrangements and distribution systems and increase the accuracy and reliability of the estimated development costs, the MCWSG would like to see costs defined to within 20% accuracy. This shall also include an assessment of any viable alternatives such 'Downs Proposal' and 'Home Hills' detailed on Page 12 of this RFP. Cost should include both construction

and operational estimates. It will also provide an assessment of hydro energy potential on each of the options. The designs developed from the engineering investigations will be used to support applications for resource consents. Risk assessments are expected to form part of the engineering analysis of the options.

The tasks shall include but not be limited to;

Geotechnical

- Outline the existing geotechnical information available and assess its adequacy for purpose.
- Identify any additional geo technical investigations considered necessary – estimate costs as a separate item.
- Update survey of dam sites and storage area as needed for design
- Complete geotechnical investigations for proposed dam sites
- Assess implications for dam design

Dam Designs (without hydro)

- Reassess dam locations given geotechnical findings
- Review design standards and determine most suitable dam type
- Design dams, spillways and outlet arrangements providing preliminary design drawings to consenting standards.
- Incorporate environmental requirements e.g. fish passes, visual appearance considerations etc
- Assess construction methodology
- Complete dam-break hazard assessment
- Develop construction cost estimations by creating schedules and applying realistic rates. Include appropriate margins and contingency allowances and provide confidence limits of estimated costings
- Set out Information Requirements for building consent for large dams
- Provide information and recommendations in terms of management plan requirements

4.4.2 Main/Secondary Scheme Distribution System Designs

Geotechnical

- Outline the existing geotechnical information available that is relevant to distribution system design and assess its adequacy for purpose.
- Identify any additional geo technical investigations considered necessary – estimate costs as a separate item.
- Update survey of distribution system routes area as needed for design

- Complete geotechnical investigations for all distribution works sites

Distribution System Design

- Identify hydraulic design requirements for all sections of the distribution system from the results of the hydrologic study
- Outline assumptions relevant to distribution system design made in pre-feasibility study and review
- Outline design philosophy, parameters and specifications used as basis for design including design for multiple values, e.g. aquatic habitat, micro hydro generation, recreational use.
- Align with district plan regulations and restrictions
- Revisit conceptual approach to distribution (i.e. main races with piped secondary systems)
- Review distribution system locations accounting for sub-scheme area scenarios
- Update documentation of existing relevant infrastructure
- Determine flow scenarios in light of leakage, operational losses and demand diversity
- Summarise design variants of main distribution system
- Calculate design flows required in main distribution (accounting for supply and demand locations)
- On ground assessment of engineering risks and issues on routes
- Design:
 - canals and include lining options
 - river/stream intake and discharge structures
 - scheme off-takes e.g. canal to piped
 - secondary distribution systems and assess trade-off between capital and energy
 - secondary pumping stations and assess electrical transmission and energy requirements
 - farm turnouts for surface water and piped
 - crossings (e.g. culverts, siphons, bridges)
 - hydrological controls (e.g. buffer ponds, flow dividers, weirs)
- Develop:
 - intake management plans
 - contingency plans for component failure
- Estimate the construction by creating schedules and applying realistic rates. Include appropriate margins and contingency allowances and provide confidence limits of estimated costings
- Estimate operating costs and assess maintenance requirements and replacement costs.

4.4.3 Hydro Power Generation Potential

- Determine wider hydro-generation possibilities e.g. dam, inter-canal, inter-pipe
- Assess impact of generation on hydrology, storage and irrigation scheme operation
- Assess power generation and value figures
- Consider transmission and relationship to scheme irrigation
- Estimate cost of adding hydro-generation options onto project

4.5 Environmental Investigations

The environmental investigations are a fundamental part of the feasibility study as this information will be utilised to develop an Assessment of Environmental Effects (AEE) and application for resource consent to the various regulatory authorities. These investigations are required to address the impacts of any irrigation infrastructure, inundation and expansion of the irrigated area taking into account cumulative effects and assessing the effectiveness of any mitigation measures. Specifically the investigations are to include a robust analysis of the potential impacts of land use intensification referencing different land use options with different levels and types of intensification. It is expected that all reports shall be prepared to Environment Court Standard. Key areas of study will include:

- Water Quality and Quantity/Environmental Flows
- Nutrient and Sediment Management
- Ecological/Biodiversity Assessments
- Landscape Visual Assessment

Investigations in these study areas shall include but not be limited to the following matters;

4.5.1 Water Quality Assessments

- Review assumptions made in pre-feasibility study and principles in the Community Proposition
- Summarise current status of water quality in catchment and sub catchments and identify trends
- Identify gaps in knowledge/data and where additional monitoring is critical or ideal
- Undertake predictive modelling of impacts of project on water quality
- Assess in summary the impact of:
 - existing farming and irrigation practices on water quality
 - expected effects of land use changes on water quality
 - expected changes in infrastructure related to water quality
 - expected effects of changes in water quality on aquatic habitat and species, and on recreational use.

- Identify and assess the effectiveness of a range of practices and solutions that can be applied to avoid, remedy or mitigate adverse effects.
- Assess the dependability of drinking water from groundwater or surface water.
- Determine how the quality and quantity of water supply will change as a result of the five options.
- Provide a methodology for monitoring water quality that would detect change due to changes in both water use and land use.
- A strategy for halting or managing any degradation in water quality detected from monitoring in order to achieve improved water quality.

4.5.2 Nutrient Management Assessment

This body of work is considered to be critical to the project, and will form a key part of the decision making process for all parties at the completion of the Feasibility Study. It is important that Respondents tendering on this body of work make provision to work closely with the experts conducting the water quality, economic analysis and the resource management and planning analysis. It is also important for Respondents to be aware national research and developments in the field of nutrient management, and to provide guidance on these matters as part of final output.

- Review soils data, assess soil profile changes under irrigated farming and how soil fertility and soil structure impacts on potential crops and nutrient leaching.
- Review drainage issues, particularly where it might affect the scheme or potential crop options.
- Assess and determine the range of potential land uses and associated nutrient and sediment outputs.
- Identify critical areas which may be vulnerable to land use intensification. This should include recommendations and methods for reducing or avoiding impacts of intensification.
- Make recommendations on how impacts of nutrient leaching and sedimentation can be avoided remedied or mitigated.
- Assess nutrient outputs under a range of landuse scenarios, giving consideration to ORC Plan Change 6A.
- Provide recommendations as to whether Schedule 15 Plan Change 6A guidelines can be complied with.
- Undertake an assessment of the current effects of existing landuse using Overseer and make comparisons to potential future landuse changes.
- Highlight the limitations and implications of Plan Change 6A for farmers and whether this will limit the way they currently farm or might farm in the future, i.e. use of fertilisers etc.

4.5.3 Ecological and Biodiversity Assessments

Terrestrial ecology

- Describe and evaluate all indigenous dominated habitat and ecosystems within the command and infrastructure areas including potentially inundated land.
- Identify all potentially affected threatened species
- Identify risks and vulnerability to threatened species associated with infrastructure development and intensified land use
- Identify existing protected areas for nature conservation that would be affected within the Falls Dam inundation footprint, and assess the potential effects on the values being protected.

Aquatic ecology

- Describe and evaluate all aquatic habitat and ecosystems within the command and infrastructure areas including potentially inundated land.
- Identify all potentially affected threatened species
- Summarise effects of existing environmental flows and flow regimes and water quality on aquatic ecology
- Determine suitable environmental flows, fresh flows and flow regimes and optimum water quality characteristics for sustaining healthy aquatic ecology particularly indigenous species,
- Assess the effect of
 - proposed environmental flows and flow regimes on native fish and sports fish, invertebrates and birds
 - increased nutrient leaching and sedimentation on water quality
 - change in runoff (new runoff versus reduced runoff due to conversion of flood irrigation to spray on water quality and quantity)
 - Dam operating regime and its impact on the sports fishery and native fish
 - Further Inundation of river habitat and possible impacts on native and sport fish, invertebrates, lizards, birds, and flora.

General Ecological

- Scope possible options for indigenous biodiversity enhancement on farms as integral part of farming system e.g., wetlands, riparian margins,
- Identify possible end uses of scheme water for restoring indigenous biodiversity e.g. irrigation of planted shrublands and woodlands, creation of new wetlands and riparian connections
- Identify opportunities for biodiversity enhancement in infrastructure development and as a component of overall scheme e.g. accelerated weed and pest control in riverbeds

4.5.4 Landscape Assessments

- Describe the essential landscape character and “points of difference” that contribute to Central Otago’s “World of Difference” – refer to existing studies and the Community Proposition
- Determine to what extent the characteristics and elements that make up the essential character would be retained and enhanced under irrigated development options
- Scope various approaches to re-vegetating farmland especially land cleared for centre pivot irrigation; and how it might contribute to enhanced landscape character, increase in indigenous biodiversity and higher visual amenity
- Describe/assess existing natural character of rivers, streams, lakes and wetlands and assess impact of development proposals on natural character and the extent to which natural character would be preserved or enhanced
- Provide recommendations to avoid, remedy or mitigate adverse effects
- Provide recommendations as to Riparian Planting Programs, Wetland Enhancement and Riparian Pest Management for the Catchment

4.6 Water Allocation, Planning and RMA Issues

This section of the *Feasibility Study* will need to detail methods to manage delivered water including end user driven water management and efficient water sharing and use. Any planning implications of the proposed storage and distribution systems are to be investigated and reported including planning provision changes to facilitate the construction and operation of the proposed development(s). In assessing the planning provisions, respondents should make provision to work collaboratively as a small working party with the Otago Regional Council and Central Otago District Council with respect to providing a clear framework of what consents will be required and what information will be expected to be provided as part of any resource consenting process.

Investigations in this section shall include but not be limited to:

4.6.1 Water Allocation

- Analyse Water Demand Requirements based on the ORC Aqualinc Report 2006
- Assess and determine irrigation system type, efficiencies and on-farm parameters
- Assess and determine on-farm system capacities for the schemes and sub schemes
- Recommend preferred allocation scenario
- Identify and develop strategy for allocation and develop allocation guidelines

4.6.2 Planning and RMA Issues

- Identify all relevant planning provisions and any restrictions for water quantity and quality.
- Detail expected consent requirements under both the Central Otago District Plan and Otago Regional Plans.
- Consider existing and pending national and regional policies and standards, including:
 - issues related to primary and secondary allocation and sinking lid policy
 - water measurement regulations
 - minimum flow changes
 - damming regulations
 - indigenous biodiversity
- Review current consenting/mining rights situation for existing consent holders
- Consider effects on existing utilities, buildings and telecommunications
- Identify need and mechanisms for change in existing policies/plans
- Provide recommendations on consenting strategy.

4.7 Economic and Commercial Investigations

The economic and commercial investigations are a key part of the feasibility study. Understanding the affordability of the proposed developments will be the key driver for the proposed developments proceeding, both on farm and off farm. Full economic analysis is required, to determine the levels of and extent intensification and increased production required to cover the costs of participating in the scheme at an individual farm level and cumulatively. Whether any of the options are affordable is a fundamental issue that must be addressed, although ultimately the determination of affordability will need to be made at an individual farm level.

Funding mechanisms and how cost sharing between existing and new water users also needs to be investigated. An analysis of the implications of ORC Plan Change 6A and the potential economic impacts of this, at an on farm level in terms of what land use change can be given effect to needs to be carried out.

It is expected this piece of work would be delivered by two parties; one with a farm advisory discipline and the other with commercial financing discipline.

Investigations in this section shall include but not be limited to:

4.7.1 Economic and commercial investigations

- Confirm cost of developments. This will involve working closely with engineering and geotechnical service provider.
- Identify/estimate costs associated with land acquisition for the various options.
- Work out formula for water charges based on applying the costs where they fall principle
- Determine and summarise information required for farmers to decide whether to invest including range of land uses and level of irrigation required and level of risk of adverse environmental effects.
- Summarise expected capital and operating costs for each farm and identify likely intensification or change to existing farming system to cover costs.
- Calculate a per hectare cost for all externalities (cost and benefit)
- Calculate pasture production for dryland under full irrigation
- Assess effects of irrigation on land values
- Assess impact of complementary irrigation on larger properties
- Develop farm budgets to assess affordability and provide examples as case studies
- Assess economic flow on effects and range of social, environmental and community public good outcomes on the district and region
- Identify range and methods for funding and recommend a funding option
- Review possible debt and equity funding providers and other financial sources
- Identify issues related to uptake and transition cost
- Assess risks during construction and operation

5. COMMUNITY LIAISON AND DISSEMINATION

MCWSG wishes to have direct overview of community liaison and dissemination as it has the mandate from the community to progress and complete this project. The principal consultants have a critical role to support MCWSG in identifying key community issues, provide help and support in terms of community liaison and meetings (where appropriate / required by MCWSG) and provide necessary material for newsletters and web updates to MCWSG. MCWSG will be overall in charge of cost in relation to printing and information dissemination.

6. FEASIBILITY STUDY OUTPUTS

As the full feasibility study encompasses investigations covering a number of aspects; technical, environmental and economic, to generate sufficient information for decision-makers to determine the technical and environmental feasibility and commercial viability of the project, Respondents must;

- Provide robust and comprehensive factual data;
- Provide sufficiently accurate costing to enable the economic feasibility to be proved and investors sought, and;
- Investigate outputs to enable all the necessary resource consent applications to be successfully made.

The outputs for the feasibility are therefore planned to encompass:

- A Technical Feasibility Report covering all of the items outlined in Section 4, including sufficient technical certainty, and project cost/benefit information to allow a rational decision to proceed with the project or not. This may be a range of reports under each of the five key areas.

This will require cooperation amongst the various parties involved to integrate and align the work packages and timing to ensure the total package is efficiently delivered. It will be expected of those involved to fully cooperate and share information to achieve this. As outlined above, a key element of the technical feasibility work will be the early development of the project details to allow the environmental investigations to proceed.

Activities considered to be outside the scope of this feasibility phase include final detailed dam and distribution design work for construction purposes, agreements with landowners to purchase land for the dams and distribution systems, acquisition of all technical consents (resource and building), funding agreements and actual construction.

6.1 Key Milestones and Reports

The full feasibility phase is planned to be completed by 30 September 2014, however those bodies of work which can be completed prior to this date are expected to be completed sooner. Each Respondent is required to provide an indicative timeline and delivery date, and consideration will be given to those parties who can show delivery prior to the completion date.

The successful tenderer is also expected to provide draft reports for review prior to the completion date. There will need to be an allowance made for time for the MCWSG to review and liaise with landowners and interested parties.

If the contract is awarded to one service provider it is critical that the principal consultant co-ordinates the different components adequately so a seamless coming together of the components is achieved. If the contract is awarded to more than one service provider the MCWSG Project Manager will carry out this role.

The principal consultant/lead consultants will attend a workshop with the MCWSG executive after the award of the contract to outline areas where they require MCWSG input and support in progressing and achieving the timelines outlined in their project plan.

If several service providers have been selected to deliver the project, the first workshop will also be used to plan the co-ordination of the different components. Service providers will be required to attend a further four workshops during the life of the project to ensure the required co-ordination is occurring and the project is progressing to the timeline.

A written progress report/reports on each study component shall be provided to the MCWSG through the Project Manager commencing monthly from the award of the contract. The principal consultant/lead consultants are required to attend and brief MCWSG at least 3 monthly in line with the monthly written progress reporting requirement. The written progress report needs to be provided to the Project Manager at least one week prior to any MCWSG meeting. The principal consultant/lead consultants need to make adequate provisions for attendance at water user/public meetings with MCWSG (if required) over the duration of the project.

The progress report shall include details of sub components of work in progress and completed subcomponents. Any delay into parts of the subcomponents is also required to be reported in the progress reports. Reports for each component need to be provided in draft form to be considered by the MCWSG. Queries and requested changes from the MCWSG must be addressed before the reports are finalised.

The principal consultant/lead consultants (and if required sub-consultants) are also required to make provision for presentation of the final reports to the MCWSG, as well as current and potential water users and other interested parties via public meetings through January/February 2015, or earlier.

Respondents should set out in their project timeline and pricing schedule project deliverable milestones, which will in turn form part of payment milestones. This may be discussed in detail with the successful tenderer(s).

6.2 Other Work

The MCWSG has determined that some bodies of work which are necessary to the completion of the feasibility study will be better addressed separately once the primary body of work is completed. As the project progresses, an additional RFP maybe prepared to cover the following matters;

- Cultural Impact Assessment

- Social Impact Assessment
- Historical/Archaeological Assessment
- Governance & Structure

7. SUBMISSION OF PROPOSALS

It is envisaged that because of the multidisciplinary nature of the project, several specialist providers will have to collaborate on the project. The MCWSG is prepared to consider the following:

1. A co-ordinated project proposal covering all study components with an overall project co-ordinator from the service provider's end.
2. Proposals covering one or more but not all components of the study with MCWSG providing overall project co-ordination.

The MCWSG seeks a detailed proposal including costing, timelines and progress payment schedules for carrying out the project from interested service providers. Service providers are encouraged to seek collaboration with appropriate partners if required and to identify/nominate a lead agency for the proposal. Where multiple agencies are submitting a joint tender, the CV's of all personal and key staff involved in the provision of services shall be provided, and a project leader nominated.

Proposals will be expected to include at least:

- An outline of the firms team experience and performance on projects of a similar nature
- The proposed project team, with certified curriculum vitae, structure and personnel
- An outline of Environment Court experience for key personnel who may be required to present evidence at the resource consent hearings.
- The location of team members.
- A methodology of the firm's approach to the project and intended relationship with MCWSG Executive Team.
- Suggested improvements on the current approach.
- A costing outline in line with the budget allowances included in this RFP.
- Project programme and key milestones.
- The names and affiliations of potential peer reviewers for key project elements.

7.1 Peer Review

MCWSG requires the Hydrological and Engineering and Geotechnical components of the Feasibility Study to be independently reviewed by a prominent engineering consultant prior to completion. MCWSG also requires that an appropriate contractor/s experienced in dam construction and distribution systems provide a constructability review of any proposed designs. Any significant review comments need to be addressed in the final report.

7.2 Project Budget

The estimated budget for the *Feasibility Study* is \$1,000,000 (including GST), although Respondents are expected to price the work based on a competitive tender process. The MCWSG would like to pay progress payments at monthly intervals or upon completion of agreed milestones.

Monthly accruals will need to be provided as part of monthly reporting so that costs can be tracked against budget. MCWSG reserve the right to withhold final payment of up to 10% of the cost until receipt of all deliverables required including final reports.

Annex 1 – Scope of Hydrology Work

Hydrological Investigations

The baseline Hydrological Investigations will include four key outputs:

- (1) Manuherikia Valley catchment hydrology;
- (2) Falls Dam flood flows;
- (3) Mt Ida Dam catchment hydrology; and
- (4) Mt Ida Dam flood flows.

For each Output we will produce a report and will be available to run the various models and provide results to the other contractors undertaking feasibility investigations. The models and associated reports will be completed by 31 August 2013. After 31 August contractors can request that the model(s) be run and can define the parameters (e.g. dam height, irrigated area, river management regime, spillway characteristics). For each model run resulting summary statistics and daily timeseries can be provided.

Output 1: Manuherikia Valley catchment hydrology

This Output involves refining the daily time-step hydrological model for the Manuherikia Valley. This model is described in Aqualinc's reports: "*Manuherikia Valley: Detailed Hydrology*" (June 2012) and "*Manuherikia Flow Regime and Water Quality impacts*" (December 2012). Key deliverables will include:

- (a) Naturalised daily mean flows for all of the major tributaries;
- (b) Predictions of mean daily flows at 7 key points on the Manuherikia River main-stem for each major option;
- (c) Summary statistics for all major tributaries and for the 7 key points on the Manuherikia River main-stem (max, min, mean, median, 7DMALF, FRE3, BFI).
- (d) Gross and net daily mean irrigation demands on a per hectare basis and for each major option; and
- (e) Falls Dam storage dynamics for each major option.

Aqualinc's existing model will be updated to include the most recent climate and flow data (i.e daily data from June 1973 to May 2013). The model can be run for a variety of different scenarios, including different irrigated areas, Falls Dam heights, and river management rules. The model can be extended to include hydro-power revenue predictions if required (hydro-power plant characteristics to be provided by the dam contractor).

Output 2: Falls Dam flood flows

This Output involves refinement of flood flow and flood routing dynamics for Falls Dam. Previous work is described in Aqualinc's report: "*Manuherikia Valley: Detailed Hydrology*" (June 2012). Key deliverables will include:

- (a) Refinement of peak flood flow estimates, up to a 1 in 500 year event, and indicative estimates up to a 1 in 5,000 year event. This will include further extreme event statistical analysis and further analysis of the relationship between flood flows at Ophir and at Falls Dam;
- (b) An hourly time-step model of the flood routing dynamics for Falls Dam; and
- (c) An indicative estimate of the Probable Maximum Flood.

The flood routing model can be run for a variety of different scenarios including different flood magnitudes, Falls Dam heights, and gate and spillway configurations.

Output 3: Mt Ida Dam catchment hydrology

This Output involves developing a daily time-step hydrological model for the Mt Ida Dam and Ida Burn. This model will likely be a revised version of a previous model described in RainEffect's report: "*Upper Ida Burn Irrigation Dam Feasibility Study Hydrology Report*" (June 2006). Key deliverables will include:

- (a) Naturalised daily mean flows at the dam site derived from actual flows recorded by ORC from September 2009 – August 2011;
- (b) Predictions of daily mean flows at two key locations on the Ida Burn;
- (c) Summary statistics for two key locations on the Ida Burn (max, min, mean, median, 7DMALF, FRE3, BFI) for each major option;
- (d) Gross and net irrigation demands on a per hectare base (command area to be supplied from the Mt Ida Dam distribution contractor); and
- (e) Dam storage dynamics for each major option.

The daily time step model will extend from 1973 to May 2013 and will incorporate data from ORC's two most recent flow recorder sites on the Ida Burn. The model can be run for a variety of different scenarios, including different irrigated areas, dam heights, and stream management rules. The model can be extended to include hydro-power revenue predictions if required (hydro-power plant characteristics to be provided by dam contractor).

Output 4: Mt Ida Dam flood flows

This Milestone involves refinement of flood flow and flood routing dynamics for Mt Ida Dam. Previous work is described in RainEffect's report: "Upper Ida Burn Irrigation Dam Feasibility Study Hydrology Report" (June 2006). Key outputs will include:

- (d) Refinement of peak flood flow estimates, up to a 1 in 500 year event, and indicative estimates up to a 1 in 5,000 year event;
- (e) An hourly time-step model of the flood routing dynamics for Mt Ida Dam; and
- (f) An indicative estimate of the Probable Maximum Flood.

The storage routing model can be run for a variety of different scenarios including different flood magnitudes, Dam heights, and gate and spillway configurations.