

***BENEFITS OF COMBINED TENDERING
BY WATER AUTHORITIES***

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***THE CENTRAL QUEENSLAND
EXPERIENCE***

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1 ABSTRACT

In 2002, Fitzroy River Water (the commercial business arm of Rockhampton City Council in Central Queensland) identified a considerable amount of sewer rehabilitation work that would be required to address the serious issues in their sewer network. Hydrogen sulphide gas attack, structural concerns, tree root intrusion, and groundwater infiltration were the general causes of concern. As a result, Council approved an allocation of \$1.7 million for sewer rehabilitation in the capital works budget for the 2002/03 financial year.

It was accepted that the condition of the sewers, some of which were constructed in the 1930’s, would continue to deteriorate and that it was imperative to rehabilitate as much of the infrastructure as possible with the limited funds available.

Fitzroy River Water (FRW) initiated discussions with the respective Capital Works Managers from neighbouring water authorities, namely Mackay Water and CitiWater- Townsville, with the view of establishing a Combined Contract between the three Authorities to be let to a single Contractor.

All three Authorities had extensive programs identified for the next five years for the rehabilitation of their sewer networks and funding had already been approved in the 2002/03 budgets. The combination of these programs would amount to a potential Contract in the order of \$4.5M for the year 2002/03 and \$25M over the next five years.

Such a considerable program provided the potential to attract specialised and reputable rehabilitation Contractors to the region, ensuring maximum value for money for the three Clients involved.

A major consideration for combining Contracts was to encourage the establishment of a Contractor to provide these services within the area of the combined Councils, maximising economies of scale whilst minimising annual Contractor establishment costs.

A Combined Contract was awarded in December 2002 and site work commenced in Rockhampton in late January 2003. The Contract allows for rehabilitation of house service lines and sewer mains up to 750mm in diameter. All works were scheduled for completion by 30th June 2003.

The Contracts have been completed satisfactorily and the Principals have exercised their options to extend the Contracts for a further 12 months to 30th June 2004.

This paper outlines the process and the benefits of the Combined Tendering approach from both a Principal and Contractor perspective.

1.1 KEYWORDS

Sewer rehabilitation, Rehabilitation contracts, infiltration/inflow, structural lining

2 INTRODUCTION

Fitzroy River Water (FRW) is a commercial business arm of Rockhampton City Council. Located some 630 kilometres north of Brisbane, Rockhampton is situated on the Tropic of Capricorn and is the beef capital of Queensland. Fitzroy River Water provides water and sewer services to a population of some 95,000 in the city and surrounding areas.

Some 320 kilometres further north is Mackay (population of 75,000 approx.), a regional centre servicing the sugar, mining, beef and tourism industries. Mackay City Council provides water and wastewater services through its commercial division, Mackay Water.

A further 350 kilometres north of Mackay, and well into the dry tropics, is Townsville, a city servicing a population of around 100,000. CitiWater, a commercial activity of Townsville City Council, provides Townsville's Water and Waste Water needs.

Regional Authorities such as these, in areas remote from major cities, often do not have readily available cost-effective rehabilitation solutions for their deteriorated sewers. Nevertheless they still experience similar problems to their major city counterparts.

3 BACKGROUND

3.1 HISTORY

Rockhampton's sewer network dates from the early 1930's. Materials used in the construction of the mains network include:

- ❖ Earthenware – Vitrified Clay
- ❖ Asbestos Cement- AC
- ❖ Un-reinforced Concrete
- ❖ UPVC- MPVC plastics
- ❖ DICL Concrete lined pipe (creek crossings and above ground locations etc)

FRW's sewage collection system consists of 492 kilometres of gravity mains as shown in Table 1.

The total length of rising (pressure) mains is 11.7 kilometres.

Table 1: FRW Sewage Collection System

Main Diameter	Length (m)
100	958
150	40,3775
225	32,016
300	19,722
375	12,602
450	6,856
525	1,145
600	1,569
675	4,089
750	6,115
900	3,407
Total	492,254

The figures supplied do not include internal house drainage systems upstream of the connection to Council's sewerage system.

Capacity analysis shows that theoretically, the existing system has adequate capacity to handle current and future loads, however assessment of sewerage flow data shows that the existing system is allowing significant amounts of stormwater infiltration and inflow (I/I) into the sewer system.

This results in surcharging of sewers to overflow points during periods of wet weather.

Fitzroy River Water has recognised this problem and has developed strategies to minimise the amount of I/I entering the sewer system. The strategies include house to house inspections for illegal stormwater discharges to plumbing fixtures, a smoke testing program for sewers, and a detailed condition assessment of the system to determine the locations of faults.

As part of the Asset 2000 Project, an I/I management plan was been developed and initiated with the work to be carried out over the next 10 years. Another significant project is the systematic condition

assessment and raising of manholes to above ground level along with the examination, repair and raising to ground level of all service jump-ups. The project is known as the Integrated Sewerage Rehabilitation Program and is focussed on the worst performing catchment areas in terms of I/I.

3.2 ASSET VALUATION

Consultants John Wilson and Partners (JWP) carried out a comprehensive wastewater asset valuation in September 2001. This valuation reassessed the value of all wastewater assets upwards from \$86.3 million to \$135.7 million.

Table 2 provides a summary of all sewerage asset valuation costs, based on their replacement costs.

Table 2: Summary of Wastewater Assets

Asset Category	Replacement value
Sewage Pump Stations (29 active)	\$4,056,799
<i>Sewage Treatment Plants</i>	
South Plant	\$5,171,700
West Plant	\$4,836,150
North Plant	\$10,763,000
<i>Reticulation</i>	
Rising Mains	\$2,143,742
Gravity Mains including Jump ups	\$79,554,314
Manholes (11,429)	\$29,200,000
Total	\$135,725,705

Wastewater Mains/Jump Ups

The valuation of sewerage mains has been predominantly based on utilising relining methods to refurbish sewers and includes an allowance for jump ups and lateral junction reinstatement as summarised in Table 3. Figure 1 provides a graphical presentation of the same information.

Table 3: Summary of Wastewater Mains/Jump Ups

Main Diameter	Length (m)	Replacement Cost (\$)
100	958	93,759
150	403,775	57,288,824
225	32,016	4,930,464
300	19,722	3,806,732
375	12,602	2,709,430

Main Diameter	Length (m)	Replacement Cost (\$)
450	6,856	1,983,471
525	1,145	432,810
600	1,569	593,082
675	4,089	1,819,605
750	6,115	3,320,445
900	3,407	2,575,692
Total	492,254	79,554,314

Figure 1: Sewer Mains Replacement Values

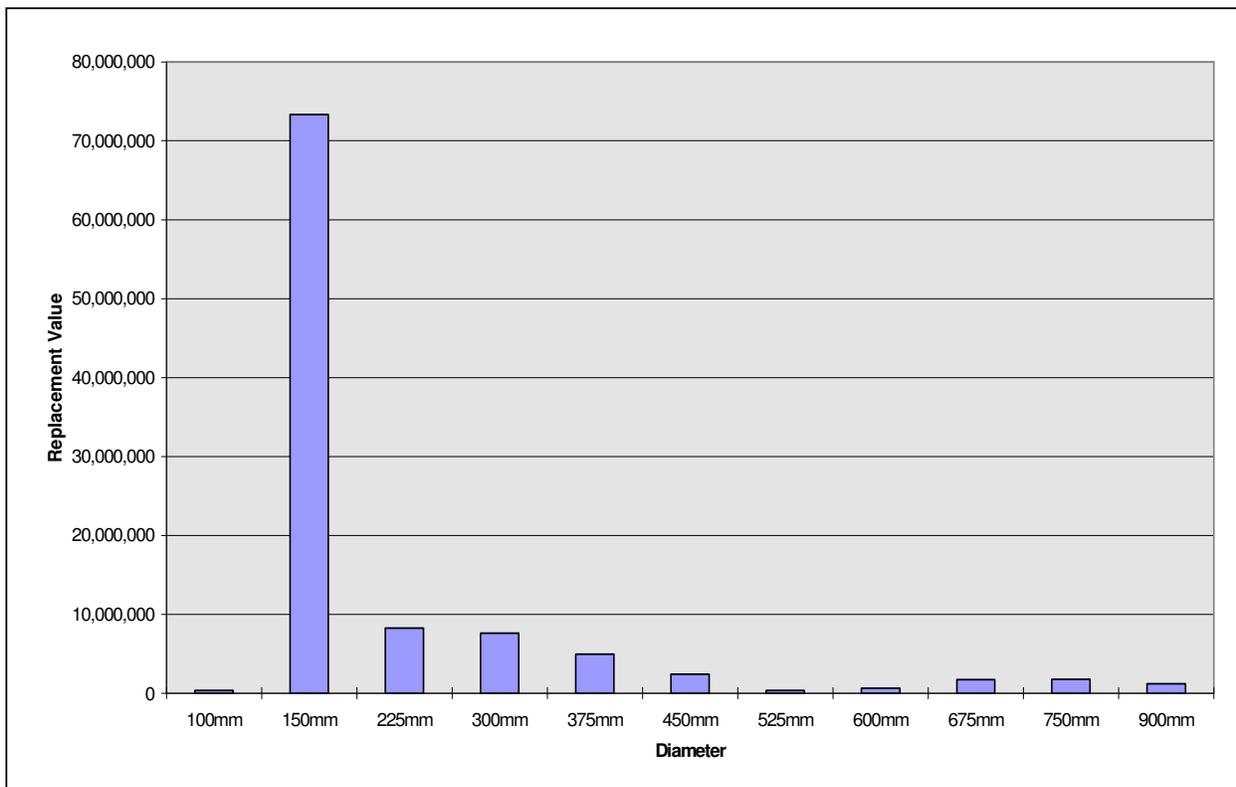


Table 4 indicates the types of pipes used in sewer construction in each decade. These figures are based on the number of sewer segments regardless of pipe diameter. Figure 2 provides a graphical presentation of the data.

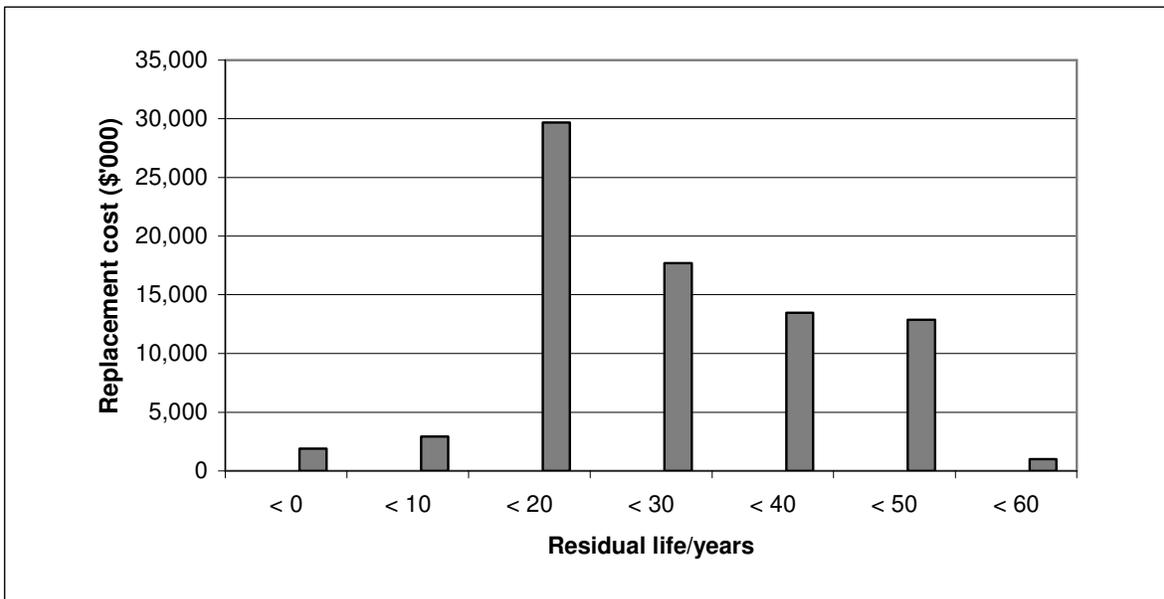
Table 4: Summary of Pipe Material Data by Decade

Material	1936-39	1940-49	1950-59	1960-69	1970-79	1980-89	1990-99	2000 Onwards
Earthenware	97.4%	90.3%	27.4%	50.3%	6.8%	1.2%	0.0%	0.0%

Concrete	2.4%	9.6%	72.3%	49.5%	91.0%	8.3%	0.8%	0.0%
Cast-iron	0.2%	0.1%	0.4%	0.1%	0.1%	0.1%	0.0%	0.0%
UPVC/ MPVC	0.0%	0.0%	0.0%	0.1%	2.0%	89.8%	99.3%	100.0%
Asbestos Cement	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%

The majority of the sewers laid during the period of 1950~1979 were concrete which has a relatively short assumed economic life of 50 years. In contrast, the majority of sewers laid during the period 1936~1949 were earthenware which has a longer assumed economic life of 80 years. As a result, a large proportion of sewers from these periods will theoretically be due for replacement at the same time. This has significant implications for expenditure in future years. Figure 3 provides a graphical presentation.

Figure 2: Residual Life Profile of Existing Sewers



4 SEWER REHABILITATION IMPLEMENTATION

4.1 PLANNING

In the preparation of Fitzroy River Water’s Strategic Asset Management Plan (SAMP) in 2001 it was identified that a considerable amount of rehabilitation work would be required to repair the serious degradation that had occurred to the sewer network and to minimise the infiltration of ground water and the incidence of sewer surcharge at times of peak wet-weather flow due to:

1. Age;
2. Gas attack;
3. Longitudinal and transverse cracking;
4. Tree root intrusion etc; and
5. Illegal roof / stormwater connections.

It was accepted that the condition of the sewers, some of which were constructed in the 1930's, would continue to deteriorate and that it was imperative that critical repairs to as much of the sewer network be undertaken as soon as possible with the limited dollars available.

Fitzroy River Water (FRW) initiated discussions with the individual Capital Works / Contracts Managers of Mackay Water and CitiWater-Townsville with the view of establishing a combined contract between the 3 business activities of the respective Cities and a single service provider.

It was recognised that by combining the knowledge, experience, technical and procedural expertise of two or more Local Government Authorities, significant additional advantages would be gained through networking and personal development of its officers.

Although some officers had some considerable distance to travel to attend the preliminary meetings the additional costs were completely offset by the exposure to a fresh approach to the Tendering process. The teamwork and friendships that developed have continued to this day and are invaluable to the officers and Councils alike.

All three businesses had extensive programmes for the rehabilitation of their sewer networks identified for the next 5 years (minimum) and funding had already been approved in the 2002/03 budgets for Mackay Water (\$0.8 million), CitiWater (\$2.0 million) and FRW (\$1.7million).

The combination of these programmes would amount to a potential contract in the order of \$4.5 million for the year 2002/03.

This offered a possible expenditure within the Central / North Queensland regions for the rehabilitation of sewers, in the cities of Mackay, Rockhampton and Townsville, of approximately \$25 million over the next 5 years. Work of this magnitude was considered to be an incentive for a reputable service provider to pursue the lowest available rates offering true value for money. This was considered motivation enough to investigate a Combined Tendering approach.

A major consideration for combining the Contracts was to encourage a reputable contractor to establish a base to provide these services within the area of the Combined Councils i.e. Central / North Queensland.

Traditionally the major rehabilitation Contractors have been based in the South East Corner (Brisbane) of Queensland or had come from interstate. If there was sufficient incentive for a Contractor to base themselves within the Local Government areas of Central and Northern Queensland, then the high initial establishment costs for each project could be avoided. Significant savings could be made by way of a reduction in the travelling and living away from home overheads that have to be incorporated in the rates.

As an example, FRW awarded a contract for the relining of trunk sewers for the year 2001/02 to the value of \$800,000. The initial set up cost and mobilisation was in the order of \$20,000 or 2.5% of the initial contract sum.

The increased quantities of materials could amplify the purchasing power of the service provider, which would lead to significant reduction in the base cost for these services with the savings being passed on to Council.

It was also envisaged that with the establishment of the Contractor's office/depot in the region, opportunities for local employment would be increased and local businesses would also benefit by an increased trade with other local businesses.

A report outlining these benefits was presented to the respective City Councils in September of 2002 and subsequent approval to proceed with the negotiation was granted.

4.2 DELIVERY OF THE COMBINED PROGRAMME

A project team consisting of Jeff Ballard (CitiWater-Townsville), Jason Devitt (Mackay Water) and Neville L'Oste-Brown (Fitzroy River Water) met in Mackay, Central Queensland, to develop the technical specifications and tender documents.

At this time an invitation was extended to the major contractors in the industry to meet with the project team from the Local Authorities and to have discussions with respect to the pros and cons of the proposal.

Kembla (Australian Pipe Reliners) and Interflow Pty Limited accepted invitations to attend so that the project team could gauge the industry's support for the concept of the combined tender.

Senior Management of both companies met the concept with total acceptance and valuable assistance was given from past experiences on similar large-scale contracts that they had been involved with in the past. The following issues were considered and options addressed:

- Type and duration of contract;
- Timing;
- Relocation;
- Setting up of a branch / regional office – depot; and
- Cost benefits etc.

From these discussions it was found that the Contractors preferred the creation of a common technical specification that complied with all relevant Industry Standards and was based on sound engineering principles. This assisted them in showing the direction for their forward development and product expansion and could lead to significant cost savings. It was generally felt that AS 2124 was the preferred General Conditions of Contract document, however it would probably need to be reviewed and amended.

Due to the complexity, nature and possible duration of the eventual contract it was considered appropriate to obtain a legal review of the documents and it was agreed that Mr. Brad McCosker, of the Construction Industry and Projects Group of McCullough Robertson Lawyers, Brisbane would be engaged to review the tender documents that had been prepared.

As part of this review the General Conditions of Contract, AS 2124 (1992) were amended and additional clauses inserted to bring them up to date and to cover such items as current industrial relations, workplace health and safety, third party warranties and goods and services taxes (GST) to name a few.

The format adopted for the combined tender was such that all works would be undertaken under a common Technical Specification and General Conditions of Contract (AS2124-1992) and that each Council would set up and sign individual Contracts with the successful tenderer.

At this point of the project, CitiWater withdrew leaving Mackay and Fitzroy River Water to proceed. This effectively reduced the scope of works to be offered by approximately 40%.

It was decided that the benefits that could be achieved from the combined tendering process were sufficient justification for Mackay and Rockhampton to carry on with a reduced scope of works and subsequently tenders were called, closing on 20th November 2002.

4.3 AWARDING THE CONTRACT

Three tenders were received and evaluated. At the December meetings of the Councils it was decided to award the Contract to Interflow Pty Ltd. Their proposal was for the installation of Rib Loc Expanda Pipe for the deteriorated sewer mains.

A pre-start meeting was held on 18th December 2002 and work was scheduled to commence in Rockhampton on 27th January 2003.

The following are some of the conditions of the Contract

- That all works must be completed by 30 June 2003;
- That no extension of time will be granted due to inclement weather;
- That each Council reserve its right to extend the Contract for a further 12 months, terminating on 30 June 2004;
- That each Council reserve its right to vary the location and extent of the work; to delete or add sections of relining to the Schedules as may be deemed necessary for the satisfactory completion of the Contracts, including the right to delete work and to award it to others;
- No provision is made in the Schedule of Rates for mobilisation. This cost was deemed to be included in the rate per metre to rehabilitate the sewers. This allowed the Authorities to obtain an accurate cost per linear metre for each diameter of pipe;
- The scope of works called for the relining of trunk mains from 750mm to 225mm and for minor mains 150mm and 100mm in diameter;

Interflow in their tender submission offered to undertake additional works (beyond the current scope of works) at a further reduced rate.

Interflow Pty Limited has since set up a Regional Depot in Rockhampton and has commenced work on the rehabilitation of the Trunk Sewer Mains.

5 THE CONTRACTOR'S PERSPECTIVE

A contract situated in a remote location such as this can be particularly attractive for a Contractor only if it is sufficiently large. There is the possibility, and incentive, for the Contractor to greatly reduce costs and therefore the tendered rates to the asset owner.

There are two components to starting a Contract. One is physically getting men, vehicles and supplies to site. These costs are generally regarded as “establishment”. They are job/contract specific and so are priced accordingly.

The second cost is contract set up, and includes items such as

- Bank Guarantees;
- Insurances;
- Setting up project database;
- Preparation of construction work packages; and
- Ordering materials.

Interflow knows that this second group of costs is virtually identical regardless of the size of the contract. Up to this point Interflow had factored these costs in as a percentage of the total job cost. Immediately we identified an opportunity to reduce our rates by over \$10,000 on a job of this size.

A normal contract of say \$500,000 in an area remote from an Interflow base in Brisbane, Sydney or Melbourne involves 2 lining crews living away from home for 4 – 6 weeks, depending on the nature of the project. Each crew consists of 5 men staying away for almost the duration of the job.

So on a six weeklong project, living away from home expenses cost the Contractor well over \$30,000. Typically, crews would also be flown home for at least one weekend during such a contract.

Thus living away from home and such ancillary expenses could add up to \$40,000 for a \$500,000 contract. If a contract was sufficiently large to make training and employing local labour viable, then these costs could be avoided.

Interflow’s rates for this Contract were based on commencing the works with experienced Brisbane based crews but progressively recruiting local labour over the length of the contract.

Savings in this area alone resulted in a reduction of \$50,000 to the tendered rates.

Certainty of work allows the successful contractor the opportunity to plan resources and facilities more efficiently. The ability of an individual or a company to negotiate lower prices is based on the size of the “carrot” being dangled.

While these savings may appear small, they do add up when applied to up to 50 items during the contract. For instance, Interflow negotiated a reduction of \$40 per spool for the transport of Expanda Pipe profile compared to the previous contract with Fitzroy River Water.

Servicing and repairing the equipment is a specialised job. Normally breakdowns are air freighted to either Brisbane or Sydney for overnight repairs then air freighted back at very high cost. Securing a larger contract enables Interflow to work with local industry to train and assist them to service and repair a lot of this equipment. This outlay is not normally justified on a standard contract.

Having a permanent base enables the contractor to develop other business opportunities more easily and economically than from “out of town”. While this is hard to quantify, it certainly impacts on final pricing.

Interflow installs the Rib Loc range of spirally wound lining systems. This offers particular advantages on a project such as this as a smaller materials inventory is needed. Rib Loc Expandable Pipe is made by spirally winding a strip of plastic profile, locking the edges together to form a "pipe within a pipe." A mechanical process then expands the liner to contact the wall of the deteriorated host pipe. Thus it is not necessary to have pre-manufactured liners in stock for each diameter at different wall thicknesses to meet different loading applications.

With Rib Loc Expandable Pipe only 5 different configurations of profiles are needed to cover the diameter range from 150mm to 750mm, in all but the most exceptional loading conditions. This minimises the required materials inventory, and, as profile strip is stored on spools, also minimises the storage space needed.

6 THE REALISED BENEFITS TO COUNCILS

As a result of the initiative taken by Fitzroy River Water in combining with Mackay Water to produce a single tender, significant cost reductions have been achieved.

An overall saving of 12% has been initially realised when compared with the average rate paid for relining in the previous contract in 2001/02.

When converted to dollars, this amounts to \$129,000 for Fitzroy River Water.

When this 12% saving is added to the further 5% reduction offered by Interflow in the Tender Submission for future works, a direct saving of 17 % against the 2001/02 single party contract administered by Fitzroy River Water is achieved.

This saving effectively gives Fitzroy River Water an additional \$280,000 per annum of sewer rehabilitation that can be completed if the budget for future years remains unchanged.

This is approximately \$1.4 million over the next 5 years. This is a most significant advantage of the Combined Tendering approach. The direct savings attributable to Mackay Water cannot be accurately quantified, as this was the first contract of this nature undertaken by Mackay. However, it is safe to assume that the savings experienced would be similar to FRW on a percentage basis against the open market.

Additional value to Rockhampton is also provided through the creation of new local employment opportunities with the establishment of the Contractor's regional depot. Interflow has made a firm commitment that the company will employ upwards of 20 persons in the long term to work out of the Rockhampton depot and that ideally they would reside locally.

7 CONCLUSION

The experience of Fitzroy River Water is that by combining the capacity, knowledge, experience, technical and procedural expertise of two or more Local Government Authorities, significant additional advantages are to be gained through networking and personal development of its officers.

The additional costs (if any) were completely offset by the exposure to a fresh approach to the Tendering process. The satisfaction level of the individual officers when a Combined Tendering project is successfully concluded is enormous.

In this particular case, not only have massive savings in the cost of sewer rehabilitation been achieved and closer working relationships established between two adjacent Councils but a new local businesses has been created, offering additional employment opportunities and flow-on benefits for Rockhampton, Mackay and the Central Queensland region.

The advantages and benefits of having the contractor's office established locally is very important from a day-to-day contact point of view. The reduction of establishment costs that historically have been between 5% and 15% of the total budget is not to be ignored.

The overall advantages and cost reductions of combined tendering speak for themselves.

Both Mackay Water and Fitzroy River Water have extended the current Contracts for a further 12 months to take advantage of the additional 5% reduction in rates offered by Interflow.

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