
MUNICIPAL INFRASTRUCTURE GRANT (MIG)

UMGUNGUNDLOVU DISTRICT MUNICIPALITY

uMshwathi Local Municipality: Existing and Proposed Housing Development in Trust Feeds and on the Remainder of Portions of Farm Camel Hoek No. 1320

FEASIBILITY STUDY / TECHNICAL REPORT

PROVINCE	:	Kwa- Zulu Natal
PROJECT NAME	:	Community Water Supply to Trust Feeds and Camelhoek
DATE	:	January 2013
MIG FUNDING (incl. CPA)	:	R 29 762 029.39
VAT	:	R 4 166 684.12
PROJECT COST	:	R 33 928 713.51

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Description

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- Annexure A : Locality Plan
- Annexure B : Cost Estimates and Schedule of Quantities
- Annexure C : Operations and Maintenance Model
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- Annexure E : DM / Exco approval

ABBREVIATIONS

CBC	Community Based Contractor
MIG	Municipal Infrastructure Grant
DWAF	Department of Water Affairs and Forestry
PMU	Project Management Unit
ISD	Institutional and Social Development
KPI	Key Performance Indicator
LA	Local Authority
LG	Local Government
O&M	Operation and Maintenance
PDI	Previously Disadvantaged Individual
PDC	Previously Disadvantaged Company
PSC	Project Steering Committee
RDP	Reconstruction and Development Programme
WSA	Water Services Authority – uMgungundlovu District Municipality
WSP	Water Services Provider – uMgungundlovu District Municipality

EXECUTIVE SUMMARY

uMshwathi Local Municipality : Existing and Proposed Housing Development in Trust Feeds and on the Remainder of Portions of Farm Camel Hoek No. 1320.

1. PROJECT INFORMATION

Project name: Community Water Supply to Trust Feeds and Camelhoek

- **Background**

Project area

The uMshwathi Local Municipality falls on the north-eastern part of the Umgungundlovu District Municipality confines in the province of Kwa-Zulu Natal.

This feasibility study addresses the water needs of approximately 3800 housing units within the project area which is located approximately 4km North West of Wartburg, on the eastern periphery of the uMshwathi LM boundary (refer **Locality Map**) within Ward 8 of uMshwathi Local Municipality.

The project includes:

- The existing semi-formal low income housing development known as Trust Feeds, which comprises approximately 800 houses.
- A proposed 3000 unit low income development which has been approved by the Department of Housing to eliminate the housing backlog within the region. The new development is adjacent to Trust Feeds and is situated on:
 - Rem of Portion 8 (of 5) of the Farm Camel Hoek No. 1320
 - Rem of Portion 16 (of 12) of the Farm Camel Hoek No. 1320

Access to the area is off District Road 75. The coordinates of the project area, taken in the centre of the area, are Latitude 29 ° 24' 17,03" south and Longitude 30 °31' 58,62" east.

- **Population:**

The estimated current population within the project area is approximately 4800 residing in approximately 800 homesteads. On completion of the housing project in 2016 the projected population within the area is 22 950 persons - :

It is anticipated that there will be nominal increase in population growth within Trust Feeds over the next 20 years and this has been calculated as follows:

0.8 % growth pa over 20 yrs x 800 households = 938 households,

resulting in a total population of 23 622 at the 20 year design horizon.

The estimated current water demand is **264.0kl/d @ 55 l/p/d, based on typical consumption to homesteads with individual yard connections** as well as estimated demands based on metered volumes by Umgeni Water to the semi-formal Trust Feeds development. This current demand of 264.0kl/day is expected to grow to 1973.38 kl/d and 2362.20kl/day @ 100l/p/d for the Trust Feeds development and 600l/site/day for the Camelhoek low income housing in ten and twenty years time respectively.

- **Demarcation:**

The development area falls within Ward 8 of the uMshwathi Local Municipality (KZN 221), and falls under the uMgungundlovu District Municipality (DC 22).

- **District Municipality:**

uMgungundlovu District Municipality.

- **Project Management Unit:**

uMgungundlovu District Municipality.

2. PROJECT OBJECTIVES

The project objectives are as follows:

- To provide the Umshwathi low income housing development with an **adequate, safe, reliable** and **sustainable** water supply based on the Guidelines for Human Settlement Planning and Design, whilst at the same time addressing water losses due to an ageing existing network infrastructure in the adjacent semi-formal residential development of Trust Feeds.
- Approximately 3800 houses will benefit from this project, with a resultant improvement in the **health and hygiene** situation in the area.
- To create local **job opportunities** during the implementation phase and during the operation and maintenance phase.
- To build capacity and empower the local community in taking charge of their own affairs, through sound and accountable **institutional structures**.
- To build **awareness** for the **environment** and the **value of water** as a scarce resource.

3. EXISTING AND PROPOSED WATER SOURCE AND SUFFICIENCY

The entire uMshwathi area is dependent on a Regional water supply from Umgeni Water , which feeds from Pietermaritzburg to Wartburg and beyond. This bulk supply is currently under severe stress and at present there is little or no capacity for future development in the region. Umgeni Water has committed to upgrading the supply to Wartburg by July 2015 . Design is being undertaken in – house and construction is scheduled to commence in Jan 2014.

Trust Feeds is currently served by a +/- 350 kl reservoir and an ageing asbestos cement pipe network which was installed around 1990.

The current Trust Feeds reservoir position cannot provide adequate pressure to approximately 720 residents situated within approximately 120 homesteads positioned around and below the existing reservoir. In addition, the existing ageing network within Trust Feeds results a large percentage of losses, resulting in portions of the lower Trust Feeds area being starved of supply.

The current consumption measured by uMgeni Water at Trust Feeds is approx. 0,8MI / day.

The total future demands equate to 2716.53m³/day (or 452.78m³/hr) and uMgeni Water have confirmed that once their upgrade is complete they will be able to meet the future demands of the development areas.

A new 3MI supply reservoir feeding from the uMgeni system and approximately 4.6km of 315mm pipeline will be constructed under the uMshwathi Bulk Water System project to supply water to the site boundary.

4. COMMUNITY NEEDS

The needs of the community can be summarized as follows:

- A reliable network capable of supplying all areas equally is required to ensure that there is harmony amongst the beneficiaries.
- **Job opportunities - two eighteen month contracts are envisaged to create a minimum of 31680 employment days at a direct cost in excess of R4,5m.**
- Economic empowerment.
- Institutional empowerment.

5. A BRIEF OVERVIEW OF PLANNED SCOPE OF WORK

The planned scope of work will consist of the following items:

- Subdivision of the supply into appropriate pressure zones to provide adequate pressure to serve the high lying areas within both Camelhoek and Trust Feeds;
- The introduction of pressure reducing valves to address high static pressures in the lower lying areas of Trust Feeds and to limit static pressures to the proposed Camelhoek development to within applicable and preferred limits, also forming part of a water loss management within these areas;
- Construction of a small bulk link to the proposed reservoir off the Umgeni Water supply main from Wartburg;
- **Construction of 7.8 km bulk supply ring main through the development which will accommodate 712 supply take-off points and a 3.2 km internal ring main, which will accommodate 260 supply take-off points** to the internal distribution networks. (Internal networks to new development by Dept of Housing);
- Construction of 9.5 km bulk supply ring main through the Trust Feeds development which will accommodate 108 supply take-off points to the internal distribution networks);
- Construction of a water reticulation network to approximately 800 households within the Trust Feeds development;
- Refurbishment of the existing Trust Feeds reservoir to function as a break pressure tank with limited storage to supply the middle and lower pressure zones;
- The network will include for air valves, isolating valves and scour valves. Isolating valves will be located to minimise the effect of closure on the supply and to suit scour activities;
- Bulk meters will be provided at the boundary to each area;
- The networks are designed to cater for ultimate demands of 600l/site/day for the proposed low income Camelhoek development which equates to 100l/c/day, based on demographics of 6 people per household. The networks will also cater for ultimate demands of 100l/c/day to the Trust Feeds development with the demographics of 6 people per household.
- The majority of the current consumers within the Trust Feeds development have individual metered yard connections and these connections will be transferred and reconnected to the proposed Trust Feed network.
- It is envisaged that any new yard connections will be installed and paid for by the payment of a connection fee.

6. SUSTAINABILITY INDICATORS

The factors influencing the sustainability of the scheme are favourable and are summarised as follows:

- this project will now directly provide a projected population of approximately 23 622 people within the area with water at the **current level of supply of 55l/c/d typical for yard connections and, ultimately 100l/c/d or 600l/site /day** for the low income housing development;
- The existing scheme in the area has been operating successfully for years and is managed by the WSP, Umgungundlovu District Municipality, and Umgeni Water
- There is very strong local leadership and strong support from the Local Authority Councillors and WSP. All recognise the importance of a sustainable scheme for all, in order to develop the region economically;
- Overall Operation and Maintenance costs are as indicated - refer Annexure C of this report.

7. SANITATION

The implementation of the project will provide the area with an opportunity to improve the hygienic conditions in the area due to the availability of clean, potable water.

The WSP and Local Municipality support the sanitation option of waterborne sewers to serve individual households within the project area and a separate feasibility report is being submitted in tandem with this application.

The need for promotion of environmental health, good hygiene practices and sanitation as the first step leading to the creation of improved community sanitation is recognised and will be addressed under the ISD component.

8. PROPOSED OPERATION AND MAINTENANCE MODEL

The level of service for the Community Water Supply will be at the current level of service, comprising yard connections and new consumers will be connected through metered private household connections applied and paid for by the relevant household and installed by UMGUNGUNDLOVU District Municipality.

The operation and maintenance model will conform to the existing O&M model for the WSP. The Water Services Provider is uMgungundlovu District Municipality.

Estimated overall Operation and Maintenance costs are scheduled in Annexure C of this report.

9. TRANSFER

No transfer of assets will take place. The Water Service Provider is legal owner of the scheme.

10. COST ESTIMATE

The estimated project costs are summarized as follows: (Please refer to Annexure B for Cost Summaries and Schedule of Quantities)

ITEM	BUDGET CAMELHOEK	BUDGET TRUSTFEEDS	TOTAL BUDGET
Estimated Construction Cost (Total Capital Cost)	R8 599 811.39	R14 025 000.00	R22 624 811.39
Planning / Feasibility Study costs,	R75 000.00		
Professional Fees (Engineering and ISD)	R1 246 972.65	R2 594 810.00	R3 841 782.65
Environmental Applications	R 110 000.00		R 110 000.00
Sub Total	R10 031 784.04	R16 619 810.00	R26 651 594.04
Escalation (7% p.a.)	R702 224.88		R720 224.88
Escalation (7% p.a.)		R2 408 210.47	R2 408 210.47
Sub Total	R10 734 008.92	R19 028 020.47	R29 762 029.39
14% VAT	R1 502 761.25	R2 663 922.87	R4 166 684.12
TOTAL ESTIMATED BUDGET (incl. VAT)	R12 236 770.17	R21 691 943.34	R33 928 713.51

Design households served	-Trust Feeds	937
	-Camelhoek	3000

Design population served (projected):

Trust Feeds	5622
Camelhoek	18 000

Project cost per capita –	Trust Feeds	R 3 858.40
	Camelhoek :	R 679.82

The average cost per capita, allowing for escalation, professional fees and VAT equates to **R 1 436.32 for the projected population.**

Note : Project costs scheduled above exclude internal reticulation networks and connections for the Camelhoek development . Internal reticulation infrastructure will be funded by the Department of Human settlements at an estimated cost of R 14 680 000. This equates to R 4893.30 per household.

Although Trust Feeds results in a high average cost , mitigating factors listed below need to be taken into consideration.

- The Trust Feeds development comprises 225 hectares, with 800 large sites situated in dense clusters but with the clusters dispersed within the 245 hectare project area, at an average density ratio of 3.56 homesteads per hectare (or 1 homestead per 2812 square meters).
- This compares to the Camekhoek development, comprising 3000 sites situated within a 175 hectare project area, resulting in a density ratio of 17.14 sites per hectare (or 1 site per 583 square meters), approximately 5 times the density ratio or number of houses per hectare than Trust Feeds.

11. PROGRAMME

B.P. submission	January 2013
B.P. approval	February 2013
Environmental Approval	July 2013

TRUST FEEDS

Design and initial ISD phase	Commence December 2012
Construction phase	July 2013 to December 2014
Practical Completion and Commissioning	December 2014

CAMELHOEK

Design and initial ISD phase	Commence December 2012
Construction phase	January 2014 to June 2015
Practical Completion and Commissioning	June 2015

12. RECOMMENDATION

uMgungundlovu District Municipality will be responsible for the O & M of the scheme after practical completion.

The project will be funded by MIG (See Financial Summary).

1. INTRODUCTION**1.1 PROJECT TITLE**

Community Water Supply to Trust Feeds and Camelhoek

1.2 PROJECT NAME

Project Number	Project Name	District and Local Councils	Project Type	Budget
	Community Water Supply to Trust Feeds and Camelhoek	uMgungundlovu District Municipality	Water Supply Scheme	R 33 928 713.51

1.3 PROJECT LOCATION

The uMshwathi Local Municipality falls on the north-eastern part of the Umgungundlovu District Municipality confines in the province of Kwa-Zulu Natal.

This feasibility study addresses the water needs of approximately 3800 housing units within the project area which is located approximately 4km North West of Wartburg, on the eastern periphery of the uMshwathi LM boundary (refer **Locality Map**) within Ward 8 of uMshwathi Local Municipality.

The project includes :

- The existing semi-formal low income housing development known as Trust Feeds , which comprises approximately 800 houses;
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 - Rem of Portion 16 (of 12) of the Farm Camel Hoek No. 1320

Access to the area is off District Road 75 . The coordinates of the project area, taken in the centre of the area, are Latitude 29 ° 24' 17,03" south and Longitude 30 °31' 58,62" east.

(See attached locality map – Annexure A).

1.4 PURPOSE OF THE FEASIBILITY STUDY

The purpose of this Feasibility study is to:

- Identify sustainable water supply options to serve the current demand within the project area;
- describe a strategic programme based on water service delivery;
- access funds on behalf of UMGUNGUNDLOVU District Municipality from MIG funding;
- provide a control document for setting out the time, quality and cost details for the approved scope of work;

by

- giving details of the programme and projects;
- demonstrating how the project will conform to RDP / Government requirements;
- describing how the project will be implemented and managed;
- discussing strategies for funding and sustainability.

1.5 PROJECT OBJECTIVES

1.5.1 To provide an adequate and potable supply of water

The objective is to provide an adequate long-term water supply scheme to the project area. This scheme will provide potable water to the community of Trust Feeds and Camelhoek Developments within the Umshwathi Local Municipality.

1.5.2 To achieve institutional sustainability.

Umgungundlovu District Municipality is the responsible WSP for the Operation and Maintenance of the project to ensure long term sustainability on condition that the WSA takes responsibility for the funding of the Operation and Maintenance.

1.5.3 To achieve cost recovery.

Level of service for these communities is based on Department of Water Affairs, Technical guidelines for the development of Water and Sanitation Infrastructure and The Guidelines for Human Settlement Planning for higher Level of Service (Low income housing) and cost recovery is subsidized by equitable share.

1.5.4 To achieve community participation and governance.

The Council will establish a Project Steering committee, who will assist in employment of members of the community during the construction stage of the scheme.

2. PROJECT DETAILS**2.1 PROJECT LOCATION**

Project Number	Project Name	Nearest Town and Distance to the village	Latitude	Longitude
Unknown	Community Water Supply to Trust Feeds and Camelhoek	Wartburg	29 ° 24' 17,03	30 °31' 58,62

2.2 COMMUNITY PROFILE (SOCIAL)**2.2.1 Population figures including historic trends**

Population figures have been based on the following:

- Camelhoek - assume average household population of 6 x 3000 households
= 18 000 persons
- Trustfeeds - assume average household population of 6 x 800 households
= 4 800 persons

Allow for nominal growth of 0.8% x 20 years x 4800
= 5622 persons

Total design population therefore is 23 622 persons.

TABLE 1 : DEMOGRAPHICS

No. OF HOUSEHOLDS OVER DESIGN HORIZON				DEMOGRAPHICS AT HOUSEHOLD OCCUPANCY RATE OF 6		
YEAR / No. SITES	TRUST FEEDS (No. OF SITES)	UMSHWATI (No. OF SITES)	TOTAL (No. OF SITES)	TRUST FEEDS (POPULATION)	UMSHWATI (POPULATION)	TOTAL (POPULATION)
BASE YEAR: 2012	800	0	800	4800	0	4800
YEAR: 2013	806	0	806	4836	0	4836
YEAR: 2014	812	0	812	4872	0	4872
YEAR: 2015	818	500	1318	4908	3000	7908
YEAR: 2016	825	1500	2325	4950	9000	13950
YEAR: 2017	832	3000	3832	4992	18000	22992
YEAR: 2018	839	3000	3839	5034	18000	23034
YEAR: 2019	846	3000	3846	5076	18000	23076
YEAR: 2020	853	3000	3853	5118	18000	23118
YEAR: 2021	860	3000	3860	5160	18000	23160
YEAR: 2022	867	3000	3867	5202	18000	23202
YEAR: 2023	874	3000	3874	5244	18000	23244
YEAR: 2024	881	3000	3881	5286	18000	23286
YEAR: 2025	888	3000	3888	5328	18000	23328
YEAR: 2026	895	3000	3895	5370	18000	23370
YEAR: 2027	902	3000	3902	5412	18000	23412
YEAR: 2028	909	3000	3909	5454	18000	23454
YEAR: 2029	916	3000	3916	5496	18000	23496
YEAR: 2030	923	3000	3923	5538	18000	23538
YEAR: 2031	930	3000	3930	5580	18000	23580
DESIGN HORIZON YEAR: 2032	937	3000	3937	5622	18000	23622

2.2.2 Community awareness and development

An awareness programme will be implemented for communities benefiting from the scheme (making them aware of their responsibility towards water consumption and usage, leaks etc.)

The WSP will appoint ISD Consultants who will implement a community awareness programme during construction.

The following issues will be covered with an awareness programme:

- Water wastage and good water practices.
- Vandalism and theft.

- The community must be aware of the responsibilities of the WSA & WSP and what their roles and functions are.
- Informing the community about the process of obtaining individual metered water connections for new households.
- Informing local schools, clinics, shops and other businesses of the process to obtain individual metered water connections.
- Metering of connections, billing and basic water supply.
- Liaison with school principals to inform the children of the area regarding the protection of infrastructure, wastage of water and vandalism.

The strategy followed during the implementation of the community awareness programme will be:

- The WSP social development department and community members will hold workshops.
- Presentation of water usage, good water practices, reporting of leaks, etc by the ISD Consultants will be done at schools and clinics.

Social Issues affecting cost recovery, which needs to be focused on:

- Free basic water issue
- Consumers awareness of responsibilities
- Level of service

2.2.3 Community structures, organisations and leadership profile

- i) The main community structures are the uMshwathi Local Municipality Ward Council representatives, and District Council Ward representatives.
- ii) Organisational Capacity

During the housing project approval process, meetings have been held with the Ward Councillor and community representatives from all the settlements affected by the project in order to:

- introduce the project;
- initiate the establishment of appropriate community representative structure/s;
- inform and update all the Ward Councillors of the project;
- define and explain the project processes that are envisaged; and
- update the communities on the progress of the project.

The Council will establish a Project Steering Committee, with representatives from the affected areas.

Formal meetings and discussions will be held with the PSC and communities with regards to water supply in the area during the preliminary design phase.

2.2.4 Level of involvement of women

The Municipality acknowledges the role of women in the area, and will implement government recommendations pertaining to the involvement of women on water supply projects.

Women will be actively encouraged to become involved in the project.

2.2.5 Income level and sources of income of the community

Indications are that income generated per household is limited to local employment as there are no major industries within the area. It is assumed that a large percentage of community members derive income from pensions, and farming activities. The income level including pension etc is estimated at less than R1 000 per month. Beneficiaries for the housing project all earn less than **R1000 per month**.

2.3 WATER SOURCE AND SUPPLY

2.3.1 Projected Water demand

Basic level of service is calculated at 55 litres per person per day, demands typical for yard connections which is the current level of service for the trust feeds development and an ultimate level of service calculated at 100 litres per person for the semi-formal layout pattern of the households within Trust Feeds. Basic level of service to the low cost Camelhoek housing development is calculated at 200 litres/day per formal connection and ultimate demands are calculated at 600l/site/day (which equates to 100litres per person per day based on a household occupancy of 6 people per household). The table below shows the current and projected contributing populations calculated as per 2.2.1 of this report.

TABLE 2: DEMANDS

No. OF HOUSEHOLDS OVER DESIGN HORIZON				DEMAND OVER DESIGN HORIZON		DEMANDS OVER DESIGN PERIOD (EXCLUDING LOSSES)			DEMANDS OVER DESIGN PERIOD (INCLUDING 15% LOSSES)		
YEAR / No. SITES	TRUST FEEDS (No. OF SITES)	CAMELHOEK (No. OF SITES)	TOTAL (No. OF SITES)	TRUST FEEDS (lpcpd)	CAMELHOEK (l/site/day)	TRUST FEEDS (kl/day)	CAMELHOEK (kl/day)	TOTAL (kl/day)	TRUST FEEDS (kl/day)	CAMELHOEK (kl/day)	TOTAL (kl/day)
BASE YEAR: 2012	800	0	800	55	0	264.00	0.00	264.00	303.6	0	303.6
YEAR: 2013	806	500	1306	55	200	265.98	100.00	365.98	305.88	115.00	420.88
YEAR: 2014	812	1500	2312	55	200	267.96	300.00	567.96	308.15	345.00	653.15
YEAR: 2015	818	3000	3818	55	200	269.94	600.00	869.94	310.43	690.00	1000.43
YEAR: 2016	825	3000	3825	55	200	272.25	600.00	872.25	313.09	690.00	1003.09
YEAR: 2017	832	3000	3832	61	250	304.51	750.00	1054.51	350.19	862.50	1212.69
YEAR: 2018	839	3000	3839	67	300	337.28	900.00	1237.28	387.87	1035.00	1422.87
YEAR: 2019	846	3000	3846	73	350	370.55	1050.00	1420.55	426.13	1207.50	1633.63
YEAR: 2020	853	3000	3853	79	400	404.32	1200.00	1604.32	464.97	1380.00	1844.97
YEAR: 2021	860	3000	3860	85	450	438.60	1350.00	1788.60	504.39	1552.50	2056.89
YEAR: 2022	867	3000	3867	91	500	473.38	1500.00	1973.38	544.39	1725.00	2269.39
YEAR: 2023	874	3000	3874	97	550	508.67	1650.00	2158.67	584.97	1897.50	2482.47
YEAR: 2024	881	3000	3881	100	600	528.60	1800.00	2328.60	607.89	2070.00	2677.89
YEAR: 2025	888	3000	3888	100	600	532.80	1800.00	2332.80	612.72	2070.00	2682.72
YEAR: 2026	895	3000	3895	100	600	537.00	1800.00	2337.00	617.55	2070.00	2687.55
YEAR: 2027	902	3000	3902	100	600	541.20	1800.00	2341.20	622.38	2070.00	2692.38
YEAR: 2028	909	3000	3909	100	600	545.40	1800.00	2345.40	627.21	2070.00	2697.21
YEAR: 2029	916	3000	3916	100	600	549.60	1800.00	2349.60	632.04	2070.00	2702.04
YEAR: 2030	923	3000	3923	100	600	553.80	1800.00	2353.80	636.87	2070.00	2706.87
YEAR: 2031	930	3000	3930	100	600	558.00	1800.00	2358.00	641.70	2070.00	2711.70
DESIGN HORIZON YEAR: 2032	937	3000	3937	100	600	562.20	1800.00	2362.20	646.53	2070.00	2716.53

2.3.2 Water source and sufficiency

The entire uMshwathi area is dependent on a Regional water supply from Umgeni Water, which feeds from Pietermaritzburg to Wartburg and beyond. This bulk supply is currently under severe stress and at present there is little or no capacity for future development in the region. Umgeni Water has committed to upgrading the supply to Wartburg by December 2014. Design is being undertaken in-house and construction is scheduled to commence in January 2014.

Trust Feeds is currently served by a ± 350 kl reservoir and an ageing asbestos cement pipe network which was installed around 1990.

The current consumption measured by uMgeni Water at Trust Feeds is approximately 0,8MI/day.

The future demand of 2716.53kl/day equate to 452.78 m³/hr and uMgeni Water have confirmed that once their upgrade is complete they will be able to meet the future demands of the development.

A new 3MI supply reservoir feeding from the uMgeni system and approximately 4.6km of 315mm pipeline will be constructed under the uMshwathi Bulk Water System project to supply water to the site boundary.

TABLE 3: SUMMARY OF DEMAND REQUIREMENTS

Area / Supply Zone	Demand (kl/day)		Demand (m3/hr)	
	Dec 2017 Level of Service	Ultimate Level of Service 100lpcpd	Dec 2017 Level of Service	Ultimate Level of Service 100 lpcpd
Camelhoek	862.5	2 070.00	143.75	345.00
Trust Feeds	350.19	646.53	58.37	107.78
TOTAL	1212.69	2 716.53	202.12	452.78

2.3.3 Water Quality

Treated water is supplied to Wartburg by uMgeni Water.

2.3.4 Present Water infrastructure & Shortcomings

The only supply at present is a limited supply serving yard connections within Trust Feeds via a 350kl storage reservoir.

2.3.5 Present Maintenance status and problems

Pipeline networks are asbestos cement which appears to have reached the end of their design lifespan, as water losses is a major problem in the area.

2.3.6 Scope of works - Proposed New Infrastructure

The planned scope of work will consist of the following items:

- Subdivision of the supply into appropriate pressure zones to provide adequate pressure to serve the high lying areas within both Camelhoek and Trust Feeds;
- The introduction of pressure reducing valves to address high static pressures in the lower lying areas of Trust Feeds and to limit static pressures to the proposed Camelhoek development to within applicable and preferred limits, also forming part of a water loss management within these areas;
- Construction of a small bulk link to the proposed reservoir off the Umgeni Water supply main from Wartburg;
- Construction of 7.8 km bulk supply ring main through the development which will accommodate 712 supply take-off points and a 3.2 km internal ring main, which will accommodate 260 supply take-off points to the internal distribution networks. (Internal networks to new development by Dept of Housing);
- Construction of 9.5 km bulk supply ring main through the Trust Feeds development which will accommodate 108 supply take-off points to the internal distribution networks);
- Construction of a water reticulation network to approximately 800 households within the Trust Feeds development;
- Refurbishment of the existing Trust Feeds reservoir to function as a break pressure tank with limited storage to supply the middle and lower pressure zones;
- The network will include for air valves, isolating valves and scour valves. Isolating valves will be located to minimise the effect of closure on the supply and to suit scour activities;
- Bulk meters will be provided at the boundary to each area;
- The networks are designed to cater for ultimate demands of 600l/site/day for the proposed low income Camelhoek development which equates to 100l/c/day, based on demographics of 6 people per household. The networks will also cater for ultimate demands of 100l/c/day to the Trust Feeds development with the demographics of 6 people per household.
- The majority of the current consumers within the Trust Feeds development have individual metered yard connections and these connections will be transferred and reconnected to the proposed Trust Feed network.
- It is envisaged that any new yard connections will be installed and paid for by the payment of a connection fee.

2.3.7 Phasing of work

Based on the cash flow allowance by Umgungundlovu District Municipality, the project will be funded over 2012/2013 to 2016/2017 financial years and the expected completion dates for the Trust Feeds development and the Camelhoek upgrade are December 2015 and June 2016 respectively.

2.3.8 Present Water Resource Planning

The current source of water available in the area is from uMgeni Water's bulk supply from Pietermaritzburg to Wartburg and from there to the 350kl (approximate) Trust Feeds supply reservoir. Thereafter an ageing network comprising A.C. mains services the Trust Feeds area.

2.3.9 Legal

- The project has been registered with the DAEA.
- The implementation of the project will comply with National Legislation.

2.3.10 Sanitation, Health and Hygiene

Most of the Trust Feeds community have access to potable water, although unreliable, and water related health problems are not a major concern in the area.

However the uMgungundlovu District Municipality has previously addressed, and will continue to address the following Health and Hygiene related issues:

- The benefits of using potable water from the scheme.
- Proper methods of dealing with "grey water" from washing and cleaning will be work shopped.
- Households and schools will be visited and public meetings held to promote water related issues.

2.4 INSTITUTIONAL FRAMEWORK AND PROFILE

Water Services Authority

In terms of the Water Services Act of 1997 the Umgungundlovu District Municipality is the Water Services Authority (WSA).

The Water Services Authority will provide specific support functions. Some of the functions of the Water Services Authority include:

- access to water services;
- consumers to pay reasonable charges and that such charges are in accordance with any prescribes norms and standards as stipulated in the water Act
- sanction bylaws, which contain conditions for the provision of water services in the area, as specified in the Water Act 108/1997;
- ensure the conservation of water resources;
- ensure the equitable allocation of resources to all consumers and potential consumers within their area of jurisdiction;
- to regulate access to water resources;
- provide institutional support for the project through the appointment of a Service Support Agent;
- enter into an agreements with the Water Service Providers for the provision of water within the area;

The following specific support functions will be provided by the WSA:

- Water quality testing
- Routine maintenance inspections
- Auditing
- Social facilitation
- Monitoring and evaluation

Responsible Officials

Mr B Mbambo Executive Manager: Technical Services

2.4.1 Status and proficiency of Water Services Authority

In terms of the authorization of the National Parliament, UMGUNGUNDLOVU District Municipality was authorized as a Water Services Authority in terms of the Act and is responsible for water governance and regulation, implementation, customer care, operation and maintenance.

2.4.2 Water Service Provider (Bulk and Reticulation)

uMgungundlovu District Municipality will execute the operation and maintenance of the scheme.

2.4.3 Project Steering Committee

A Project Steering Committee will be elected through local council structures.

The responsibility of the PSC is to assist during construction phase of project and to ensure the accrurement of labourers for the project.

PSC Communication Strategy

The PSC (with the assistance of the ISD Consultant) will inform the community of community meetings in each ward, regarding the water project, which will include issues such as:

- Non-payment
- Obligations and rights of the communities
- Cost recovery process

2.4.4 Cost Recovery Plan

Sustainable cost recovery will be ensured in the following way:

Extensive community facilitation, training and participation, so that the community knows exactly how they receive their water and why water must be conserved.

A proper water loss management system will be in place:

- The main supply reservoir, the break pressure tank (currently the +/- 350kl supply reservoir to Trust Feeds) and the supply to the different developments will be metered with flow control valves and data loggers. The average consumption currently is estimated **at 55 lpcpd**.
- Free basic water (6kl/household) will also be available to individual connections. Should households exceed 6kl/month they will be charged.
- The operational and maintenance cost will be budgeted for by the WSA.
- Cost recovery will be limited to authorised connections to schools, small businesses, clinics and individual household connections. The income from these sources will be limited and most of the cost will be subsidised by the equitable share.
- Bulk water meters readings will be taken and a water loss assessment will be done. Reading of Individual meters will be done every three months only, but consumers will be billed monthly and payment will have to be forwarded to the WSP.

2.4.5 Project Management Unit, Project Managers and Key personnel

Project Manager	:	Sukuma Consulting Engineers (Pty) Ltd
Address	:	P O Box 100704 SCOTTSVILLE, 3209
Telephone Number	:	033- 345 3284
Fax Number	:	033- 342 3085
Cell Number	:	082 969 4491
E-mail	:	allison@sukuma.co.za
Contact Person	:	Allison Maud

WSA	:	uMgungundlovu District Municipality
Address	:	PO Box PIETERMARITZBURG, 3201
Telephone Number	:	033 - 897 6700
Fax Number	:	036 – 394 7647
Cell Number	:	082 883 4288
Contact Person	:	S Mjwara

WSP : uMgungundlovu District Municipality
Address : PO Box
PIETERMARITZBURG, 3201
Telephone Number : 033 – 897 6700
Fax Number : 033 – 394 7647
Cell Number : 082 883 4288
Contact Person : S Mjwara

Consultants (PA) : Sukuma Consulting Engineers (Pty) Ltd
Address : P O Box 100704
SCOTTSVILLE, 3209
Telephone Number : 033-345 3284
Fax Number : 033-302 3085
Cell Number : 082 853 3349
E-mail : pmb@sukuma.co.za
Contact Person : Mike Maher

**Social Development
Consultant:**
TO BE CONFIRMED

Key Personnel O&M : Will be determined by following tender procedures as laid down by the PMU.

Departmental Managers

National Departmental Manager: Mr H Muller
Department of Water Affairs
Private Bag X 313
PRETORIA
0001
Telephone No. : 012-336 6568
Fax No. : 012-323 3877

Provincial Departmental Manager: Mr M.L. Badenhorst
Department of Water Affairs
P O Box 1018
DURBAN
4000
Telephone No : 031-336 2700
Fax No. : 031-304 9546

2.5 TRAINING AND CAPACITY BUILDING

In order to meet with the training and capacity building framework requirements, a facilitator will be appointed to facilitate the requirements in developing the project. The following key issues will be covered:

- Roles and responsibilities of all role-players (Institutional Training)
- Project Steering Committee Duties
- Awareness creation
- Community awareness.

2.5.1 Technical skills during construction

Technical training will be done during labour intensive construction, consisting of trenching, pipe laying, plumbing and fittings. This will be done under the supervision of a skilled capacity builder who will provide hands on technical training before and during the labour intensive part of the construction. During the course of the construction period, members of the community will be employed as part of the water project in order to gain construction experience.

The following skills training will be provided:

- Pipe laying
- Working with concrete for construction of valve chambers, reservoirs and small concrete structures

2.5.2 ISD Training and Capacity Building Framework

2.5.2.1 Community Participation and Governance

2.5.2.1.1 *Project Steering Committee*

The Project Steering Committee will comprise community members who represent all the settlements of the project's footprint. Most of them will be elected to the PSC on the basis of their interest in the development of their area and also on the basis of their standing within the community.

The PSC will be trained so as to enhance both their governance skills and their ability to participate fully and effectively in the implementation of the Swampu Community Water Supply.

2.5.2.1.2 *Communication System*

Communication with the project stakeholders will take place at four levels:

1. Joint Management Committee Meetings

The Joint Management Meetings will take place once every three months. Represented at these meetings will be the District Municipality, PMU, ISD consultant, Technical consultant and PSC. At these meetings project details will be discussed and policy information shared.

2. PSC Meetings

This is the forum where all project stakeholders meet and debate issues related to the project. These meetings will be held once every month.

3. Community Development Officers

Community liaison and labour related issues are to be discussed and communicated between the project implementing team and the labour teams. This communication will be achieved through the Community Development Officers employed specifically to bridge this gap.

4. Community Meetings

Communication with project communities will be achieved at community meetings, which will be held once every three months under normal circumstances. At these meetings, community PSC members report back to communities and seek mandates for new proposals. Other project stakeholders attend these meetings in order to support the PSC. Invitation to these meetings will be through PSC members and Community Development Officers.

2.5.2.1.3 *Awareness Creation*

Awareness of Government policies and guidelines will be created through discussions and information dissemination sessions at community meetings.

2.5.2.1.4 *Community Responsibilities*

The community of Swampu truly associates with this water project. The PMU together with other stakeholders such as the ISD Consultant has an obligation to ensure that the community is aware of its responsibility and that it takes over its responsibility. The strategy will be to constantly make the community aware of dangers of the collapse of their project i.e. by stressing the health benefits of their water scheme as well as the potential costs of their alternative sources of water.

2.6 FINANCIAL

2.6.1 Cost Estimate and Cost per Capita

The estimated project costs are summarized as follows: (Please refer to Annexure B for Cost Summaries and Schedule of Quantities)

TABLE 4: COST ESTIMATE AND COST PER CAPITA

ITEM	BUDGET CAMELHOEK	BUDGET TRUSTFEEDS	TOTAL BUDGET
Estimated Construction Cost (Total Capital Cost)	R8 599 811.39	R14 025 000.00	R22 624 811.39
Planning / Feasibility Study costs,	R75 000.00		
Professional Fees (Engineering and ISD)	R1 246 972.65	R2 594 810.00	R3 841 782.65
Environmental Applications	R 110 000.00		R 110 000.00
Sub Total	R10 031 784.04	R16 619 810.00	R26 651 594.04
Escalation (7% p.a.)	R702 224.88		R720 224.88
Escalation (7% p.a.)		R2 408 210.47	R2 408 210.47
Sub Total	R10 734 008.92	R19 028 020.47	R29 762 029.39
14% VAT	R1 502 761.25	R2 663 922.87	R4 166 684.12
TOTAL ESTIMATED BUDGET (incl. VAT)	R12 236 770.17	R21 691 943.34	R33 928 713.51
Cost per Capita (Including Escalation & VAT)	R679.82	R3 858.40	R1 436.32

Note :

Project costs scheduled above exclude internal reticulation networks and connections for the Camelhoek development . Internal reticulation infrastructure will be funded by the Department of Human settlements at an estimated cost of R 14 680 000. This equates to R 4893.30 per household

2.6.2 Operating and Maintenance Costs and provision for recurring costs

The operating and maintenance of this system will be carried out by uMgungundlovu District Municipality who is the Water Service Provider. uMgungundlovu District Municipality will also be the Implementing agent for this project.

The initial anticipated consumption of the overall Water Supply Scheme is calculated at 264 kl/day and consumption levels will increase reaching 2 716.53 kl/day at the design horizon.

Funds for the operations and maintenance and recurring costs will be made available from uMgungundlovu's operations and maintenance budget. The annual WSP budget is supported from equity share allocation in terms of free basic water policy.

The initial O & M costs for this project are estimated **at R1 052 210.00 per annum**. Typical annual O&M costs for a project of this nature are shown in Annexure C.

2.6.3 Funding Plan

The source of funding is MIG and funding covers the Capital Cost of the project for a basic level of service only. The project will be programmed to match the provincial department allocation of funds for the UMGUNGUNDLOVU District Municipality.

3. CONFORMITY WITH DWAF AND RDP GUIDELINES

3.1 GENDER ISSUES

The role players pledge their commitment to focus on women as the centre of development. The PMU is committed to making maximum use of female field staff as Capacity Building Trainers in order to ensure awareness of gender issues.

The involvement of woman in water supply projects is essential as woman are not only beneficiaries and customers but also decision makers regarding the purchase of water and conveyors of good water related practices for their families and children.

The involvement of women during planning and construction phases through membership of the PSC ensures:

- Communication with community members to ensure continuing community awareness;
- Communication with children with regards to health and hygiene issues;
- Communication with children regarding the need to respect and maintain the infrastructure of a water scheme.

3.2 LABOUR-BASED CONSTRUCTION

The Trust Feeds and Camelhoek Community Water Supply consists of approximately 50km of water pipe line, lends itself towards labour intensive construction methods. Preference will be given to labour intensive methodology, where practically possible, for the excavation and laying of pipes as well as for the installation of the gabions. During the construction phase extensive use will be made of the locally available PDC's and PDI's.

3.3 INVOLVEMENT OF PDI'S / PDC'S

The involvement of PDI's and PDC's will be used extensively in the ISD team. PDC's will be used for training and capacity building, and PDI's will be used for facilitation and community awareness.

3.4 EMPLOYMENT POLICY

Employment will be targeted at the most needy within the community as a first priority. To this end the training component which has been built in to the project has been designed to enhance skills to empower these members of the community to participate in a meaningful manner in the opportunities which the project will create. Target members will be single-headed households, women, the unemployed and the youth. The employment opportunities and policy to be adopted locally both during and after

construction will be discussed and agreed with the Project Steering Committee to ensure that the needs and expectations of the community are addressed.

3.5 WAGES AND LABOUR STANDARDS

This will extensively be discussed with the PSC. Wages paid on the project will be in line with the latest SAFCEC rates, task sizes will be as listed below:

- * Trenching task to be 3m³ of excavation of PVC piping.
- * Laying of pipe and backfilling of PVC piping task to be 6m³.
- * Trenching task to be 3m³ of excavation of HDPE piping.
- * Laying of pipe and backfilling of HDPE piping task to be 6m³.

3.6 CONSULTANTS AND OTHER SUPPORT SERVICES

Sukuma Consulting Engineers (Pty) Ltd have been appointed to prepare the Business Plan of the project by the UMGUNGUDLOVU District Municipality. Sukuma will be responsible for all engineering and technical aspects of the project. These include project construction, monitoring the quality of work, training, facilitation, finance and liaison with traditional authorities and ward councillors.

3.7 TENDER PROCEDURES

The UMGUNGUDLOVU District Municipality tender and procurement procedures, as approved by the State Tender Board, will be applied. Where possible training on tender procedures and calculation of rates will be provided to small and community based contractors. Targeted procurement policy will be implemented.

3.8 THE ENVIRONMENT

Proper care will be taken to minimise the impact of this project on the environment. Rehabilitation will be done thoroughly and with care. The Department of Agriculture and Environmental Affairs **will be notified** of the project and the project will be registered if required.

3.9 DESIGN CRITERIA

The planning and general concepts for the water supply project have been carried out in accordance with the DWA Technical for the development of Water and Sanitation Infrastructure dated 2004, Guidelines for Human Settlement Planning and Design dated August 2003 and the standards as set out by UMGUNGUDLOVU District Municipality for rural areas in respect of pipe specifications, dispensing units, valves, yard connections etc. as well as methods of construction of reservoirs, valve chamber and break pressure tanks.

The design parameters adopted are briefly scheduled below:

GENERAL	
Design Horizon	20 years after commission
Population Growth	0.8% (Trust Feeds)
Water Demand (Rural)	100 ℓ/p/d or 600l/site/day
Allowances for water losses in bulk & distribution	15%
Maximum Velocity	1.2 m/s
BULK DISTRIBUTION MAIN COMPONENT	
Distribution Reservoirs: Gravity Supply	24 hr storage @ 100 ℓ/p/d
Bulk Mains from distribution reservoir	100 ℓ/p/d or 600l/site/day
Distribution mains within projects	100 ℓ/p/d or 600l/site/day
Peak Factor (Design flow is dispensed in 24 hours)	4 (Bulk Service Pipelines)
RETICULATION COMPONENT	
Peak Factor PF (Design flow is dispensed in 24 hours)	4 for 100 ℓ/p/d
Water consumption	100 ℓ/p/d with PF = 4
Reticulation network to standpipes	100 ℓ/p/d
Demand for schools and Crèches	6000 ℓ/d
Demand for Clinics	2000 ℓ/d
Max and Min pressures at domestic meter point	7 Bar & 2.5 Bar Preferred
Min pipe diameter	50mm Φ
Peak Factor (Design flow is dispensed in 24 hours)	3 (Reticulation Pipelines)

- Bulk and Reticulation isolating valves : Clockwise closing RSV gate valves provided on all major branches (i.e. spurs).
- Scour Valves : Clockwise closing water works pattern wedge gate valves installed at strategic points.
- Air valves : Vent-o-Mat double orifice air valves installed at strategic points.
- LOS : System has been designed for future individual connections.
- Water meters : Provision has been made for bulk water meters in order to ensure that the system can be effectively managed.

3.10 WATER CONSERVATION AND USE

The policy on water conservation and use will be addressed during implementation by the ISD consultant. The community will be made aware that water is a scarce resource by presenting workshops to the Swampu community. Water wastage practices will be discouraged. Local Community members will be encouraged to report leaks from pipelines to the WSP, who will then attend to the matter.

4. TIME SCHEDULE

4.1 MILESTONE SCHEDULE FOR THE PROJECT

Key Point Dates:

B.P. submission	January 2013
B.P. approval	February 2013
Environmental Approval	July 2013

TRUST FEEDS

Design and initial ISD phase	Commence December 2012
Construction phase	July 2013 to December 2014
Practical Completion and Commissioning	December 2014

CAMELHOEK

Design and initial ISD phase	Commence December 2012
Construction phase	January 2014 to June 2015
Practical Completion and Commissioning	June 2015

5. REPORTING, MONITORING AND EVALUATION

5.1 PROPOSED REPORTING PROCEDURES

The PMU will be responsible for collecting data; the monitoring and reporting to the WSA on status of the scheme and reporting will be to the requirements of DORA and MIG. The WSA will be responsible for the evaluation and reporting back to the DLGTA and also act if any of the KPI's is not met.

5.2 KEY PERFORMANCE INDICATORS

The standard KPI's will be addressed during the implementation of this project. This is implemented as follows:

- Design to commissioning
- Operation and maintenance

5.2.1 Design to commissioning

Progress

- Progress on design programme
- Progress on ISD programme
- Progress on environmental application
- Progress on construction
-

Financial

- Cost to date
- Cash flow

Projected Local Labour Employment

LABOURERS	Total		Adult				Youth			
			Women		Men		Female		Male	
	Persons	Person Days	No.	Person Days	No.	Person Days	No.	Person Days	No.	Person Days
Camelhoek	40	15840	14	5544	8	3168	6	2376	12	4752
Trust Feeds	40	15840	14	5544	8	3168	6	2376	12	4752
TOTAL	80	31680	28	11088	16	6336	12	4752	24	9504

Training and ISD work

Community awareness and acceptability of project
Accredited Training

Management

Progress reports
Financial auditing
Technical auditing
ISD auditing

5.2.2 Operational and Maintenance KPI's

5.2.2.1 General Performance Indicators

The following general performance indicators will be targeted:

Service performance indicators
Financial performance indicators
Accountability indicators

5.3 MONTHLY REPORTS

The WSP will submit monthly reports on the standard M&E reporting system to the WSA.

5.4 MONITORING AND EVALUATION

Monitoring and evaluation will be done simultaneously with the reporting procedure will be compiled on an annually basis by the WSA.

5.5 PROJECT CLOSE OUT REPORT

The PMU will submit a project close out report, after completion of the project. The report will be prepared according to MIG and DWA requirements.

6. CONCLUSION

The project is to meet the social and practical mandates for all settlements that benefit from project. MIG will be responsible for financing the project from project identification to transfer, for the amount of **R39 928 713.51** VAT inclusive. uMgungundlovu District Municipality will be responsible for the Operation and Maintenance costs which are funded by the WSA.

7. RECOMMENDATION

It is recommended by the uMgungundlovu District Municipality that the project be approved by DWAF and MIG.

ANNEXURE A

COMMUNITY WATER SUPPLY TO TRUST FEEDS AND CAMELHOEK

LOCALITY PLAN

ANNEXURE B

COMMUNITY WATER SUPPLY TO TRUST FEEDS AND CAMELHOEK:

COST ESTIMATES & SCHEDULE OF QUANTITIES

ANNEXURE C

COMMUNITY WATER SUPPLY TO TRUST FEEDS AND CAMELHOEK

OPERATIONS & MAINTENANCE MODEL

Projected Consumption(kl/day)	Year	Period	Chemicals @ R0.40/kl	Electricity @ 5 KW x 18 hrs @ R0.50/KWh	Staff (employed by District Municipality)	Reticulation: 1% of Capital cost per annum	Bulks: 1,5% of Capital cost per annum	TOTAL COSTS	Cost/kl
150	1	Per month	R 2 281	n/a	R 4 950	R 5 130	R 3 457	R 15 818	R 3.47
		Per annum	R 27 375	n/a	R 59 400	R 61 555	R 41 482	R 189 812	
225	2	Per month	R 3 422	n/a	R 5 247	R 5 437	R 3 664	R 17 770	R 2.60
		Per annum	R 41 063	n/a	R 62 964	R 65 248	R 43 971	R 213 246	
300	3	Per month	R 4 563	n/a	R 5 562	R 5 764	R 3 884	R 19 772	R 2.17
		Per annum	R 54 750	n/a	R 66 742	R 69 163	R 46 610	R 237 264	
350	4	Per month	R 5 323	n/a	R 5 896	R 6 109	R 4 117	R 21 445	R 2.01
		Per annum	R 63 875	n/a	R 70 746	R 73 313	R 49 406	R 257 340	
400	5	Per month	R 6 083	n/a	R 6 249	R 6 476	R 4 364	R 23 173	R 1.90
		Per annum	R 73 000	n/a	R 74 991	R 77 711	R 52 371	R 278 073	

ANNEXURE D

COMMUNITY WATER SUPPLY TO TRUST FEEDS AND CAMELHOEK

GENERAL ARRANGEMENT: BULKS AND RETICULATION SUPPLY

ANNEXURE E

COMMUNITY WATER SUPPLY TO TRUST FEEDS AND CAMELHOEK

DISTRICT MUNICIPALITY / EXCO APPROVAL