SFD Report

Ulundi Local Municipality
Zululand District Municipality
KwaZulu Natal, South Africa

This SFD Intermediate Report was prepared by
Emanti Management.

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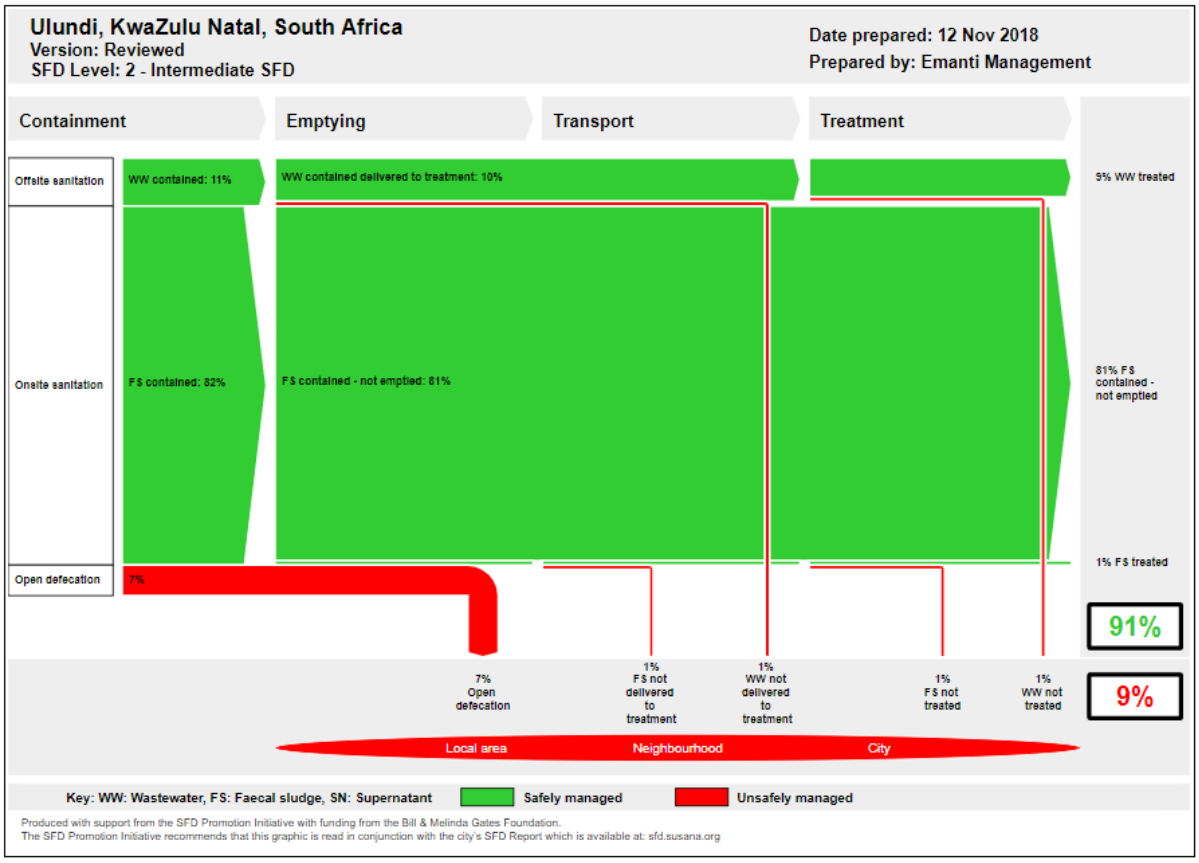
1. The SFD Graphic



2. Diagram information

SFD Level:

This is an Intermediate SFD.

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3. General city information

This SFD Intermediate Report was developed for Ulundi *Local Municipality* (LM). The Ulundi LM is categorised as a Category *B* Municipality within the *Zululand District Municipality* (ZDM), KwaZulu Natal Province. The responsibility of planning and development, including the supply of water and sanitation services, lies with ZDM for Ulundi LM. The Ulundi LM is approximately 3,250 *square kilometres* (km^2) and is located on the southern boundary of the ZDM in north-eastern KwaZulu-Natal. The Ulundi LM represents 22% of the total area of jurisdiction of the ZDM and consists of 24 wards. Ulundi LM has 8 traditional councils on Ingonyama Trust Land which cover a sizeable area and are characterised by underdevelopment and a lack of service provision.

Due to its size, the climate and topography of Ulundi LM varies depending on the location. The total population in Ulundi LM is estimated to be around 256,426. The sanitation backlog is estimated to be around 7% (open defecation). A significant number of on-site sanitation refurbishment / replacement facilities are required.

4. Service outcomes

The following sanitation technologies were noted:

- Toilet discharges directly to a centralised foul/separate sewer – flush toilets are connected directly to the wastewater treatment plant.

- Fully lined tank – sealed, no outlet or overflow – these are either buried concrete tanks, buried plastic tanks or plastic tanks covered with concrete slabs.
- Containment (fully lined tanks, partially lined tanks and pits, and unlined pits failed, damaged, collapsed or flooded – with no outlet or overflow – these are the tanks made from cement blocks with two compartments. Seepage emanating from these tanks through these blocks was noted.
- Pit (all types) never emptied, but abandoned when full and covered with soil, no outlet or overflow – these are pits that are not lined and never emptied. When full, the top structure is removed and taken to a new pit. These pits are covered with soil when abandoned.
- Pit (all types) never emptied but abandoned when full but NOT adequately covered with soil, no outlet or overflow – these are pits that are not lined and never emptied. When full, the top structure is removed and taken to a new pit. It is believed that these pits are not adequately covered with soil when abandoned.
- Pit (all types) never emptied but abandoned when full and covered with soil, no outlet or overflow – some of these unlined pits are located where the groundwater table is high. Some of these unlined pits are located in sandy soil type and ground water monitoring results have indicated non-compliance.

Based on the available data, estimates and assumptions, the SFD graphic illustrates that 91% of excreta is safely managed.

The majority of the population of Ulundi LM utilise on-site sanitation systems, specifically VIP latrines (82% on-site sanitation on SFD graphic), only 11% of the population are connected to off-site sanitation and 7% practice open defecation.

The safely managed sanitation is predominantly faecal sludge that is not emptied and remains contained in the VIPs (81% FS contained - not emptied on SFD graphic). This excreta is safely managed but it is important to note that while contained for the moment, the VIPs are not being emptied and that there is no pit emptying strategy in place. There is a need to balance capital infrastructure roll-out with an effective on-site sanitation maintenance strategy.

The balance of the safely managed excreta is mainly wastewater delivered to treatment and treated (9% WW treated) through the relatively small sewerage network. Only 1% of the safely managed is from faecal sludge emptied from the tanks, delivered to treatment and treated (1% FS treated).

And only 9% of excreta from the whole population is estimated to be unsafely managed. The majority of which is from open defecation (7% Open defecation on SFD graphic).

5. Service delivery context

The Constitution of South Africa classifies municipalities into three (3) categories (A, B and C). Category B municipalities, including the Ulundi municipal area, are LM. The ZDM – Category C Municipality – provides water and sanitation services to Ulundi LM.

The sanitation sector in the country has been guided and regulated by the following policy documents:

- the White Paper on Water Supply and Sanitation (1994);
- the White Paper on a National Sanitation Policy (1997);
- the Water Services Act (1997)
- White Paper on Basic Household Sanitation (2001)
- Strategic Framework for Water Services (2003)
- Free Basic Sanitation Implementation Strategy (2009)
- National Sanitation Policy (2006 and 2016)

The policy documents make provision for procedures, rules and allocation mechanisms for sanitation which are implemented through the policy instrument of laws and regulations; economic measures; information and education programmes; and assignment of rights and responsibilities for providing services. Implementation of the South African sanitation policy is guided by 2003 Strategic Framework for Water Services. This document guides the sanitation policy with respect to the provision of water services from rural to urban and people and industry.

Due to the legacy of Apartheid planning, the targeted area has a history of significant water

and service backlogs and lack of infrastructure. Backlogs have / are being addressed through various programmes. Details of planned water and sanitation projects can be viewed in the *Integrated Development Plan* (IDP) and *Water Services Development Plan* (WSDP) of the ZDM. The IDP is a plan for an area that provides for an overall framework for development and has a budget approved by the municipal council. The WSDP forms an integral part of the municipal IDP. Details of the sanitation programmes (which are largely focussed on rural implementation) can be viewed in the ZDM WSDP.

6. Overview of stakeholders

An overview of stakeholders involved:

- ZDM which is *Water Services Authority* (WSA) and *Water Services Provider* (WSP)
- Ulundi LM

7. Process of SFD development

This SFD Intermediate Report was developed with the assistance of ZDM. Various sources of information were used for the compilation of this report. This includes Stats SA data, IDPs, WSDPs

Data was collected through secondary sources (reports, plans) and then Ulundi was visited to conduct interviews with the relevant stakeholders, including site visits to infrastructure to witness the on-the-ground situation. This information was used to fill in gaps and cross-check data collected.

The data was fed into the SFD Graphic Generator to calculate the excreta flow in terms of percentage of the population.

10. Credibility of data

There is no reason to suggest that data from ZDM is not credible. The open defaecation figures from stakeholder engagement matched those reported in the WSDP. The reporting of different sanitation facilities with reports and plans could be improved upon.

11. List of data sources

Below is the list of data sources ued:

- Published reports: Community Survey 2016
- Published documents: IDP, WSDP
- Key informant interviews: ZDM

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Abbreviations

DM	District Municipality
DPLG	Department of Provincial and Local Government
DWA	Department of Water Affairs (now DWS)
DWAF	Department of Water Affairs and Forestry (now DWS)
DWS	Department of Water and Sanitation
FS	Faecal sludge
IDP	Integrated Development Plan
LM	Local Municipality
SALGA	South African Local Government Association
SFD	Shit Flow Diagram
Stats SA	Statistics South Africa
VIP	Ventilated Improved Pit Latrine
WRC	Water Research Commission
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSP	Water Service Provider
WW	Wastewater
WWTW	Wastewater Treatment Works
ZDM	Zululand District Municipality

1 City context

The Constitution of South Africa classifies municipalities into three (3) categories (A, B and C). Category A municipalities are metropolitan municipalities which consist of a major urbanised core. Category C municipalities are *District Municipalities* (DM) that consist of 1 or more *Local Municipalities* (LMs) (Category B municipalities). In line with the government municipal classification in South Africa, the Ulundi LM is categorised as a Category *B* Municipality within the *Zululand District Municipality* (ZDM), KwaZulu Natal Province. The responsibility of planning and development, including the supply of water and sanitation services, lies with ZDM for Ulundi LM. The ZDM is a *Water Services Authority* (WSA) and *Water Services Provider* (WSP) for Ulundi LM in terms of the Water Services Act (Act 108 of 1997, Water Services Act) (Republic of South Africa, 1997). It therefore has statutory responsibilities and accountability with respect to the provision of water services. The ZDM is the WSP for the entire district except for is the urban areas within AbaQulusi LM for which AbaQulusi LM is currently the WSP (Zululand District Municipality, 2019).

LMs within ZDM:

- AbaQulusi Local Municipality
- eDumbe Local Municipality
- Nongoma Local Municipality
- Ulundi Local Municipality
- uPhongolo Local Municipality

The Ulundi LM is approximately 3,250 *square kilometres* (km^2) and is located on the southern boundary of the ZDM in north-eastern KwaZulu-Natal (Fehler! Verweisquelle konnte nicht gefunden werden.). The Ulundi LM represents 22% of the total area of jurisdiction of the ZDM and consists of 24 wards (Ulundi Local Municipality, 2018).

The largest part of Ulundi LM is rural and underdeveloped with nearly half of the area consisting of commercial farms with a substantial agricultural community. The major urban centre is the the town Ulundi which accommodates approximately 40,000 people. Within the town, is a high population concentration and this surrounded by densely populated peri-urban areas long the main roads. The town of Ulundi serves as the primary development node with many large, densely populated tribal areas with an informal settlement pattern completely reliant on Ulundi town for employment, goods and services. There are further settlements in the following areas (Ulundi Local Municipality, 2018):

- Nqulwane in the eastern part of Ulundi with the Okhukho Coal Mine;
- Babanango which developed as a result of the forestry industry;
- Mpungamhlophe (Denny Dulton) which developed as a result of road R34 and rail infrastructure; and
- Ceza to the north which developed in response to the establishment of supportive land uses including several social support services (clinics, e.t.c).

The Ulundi LM consists of 24 electoral wards which are located on the eastern part of the municipality. Only a few areas have official cadastral boundaries: Ulundi Town, Mahlabathini, Babanango, Mpungamhlope and two small areas near Lottery and Sterkstroom. The western part of the LM is mainly areas of Traditional Council on Ingonyama Trust Land. There 8 traditional councils on Ingonyama Trust Land (**Figure 1**). These areas cover a sizeable area and are characterised by underdevelopment and a lack of service provision. Due to the high population density, concentration and service demands, large sections of these tribal areas can be classified as emerging urban settlements.

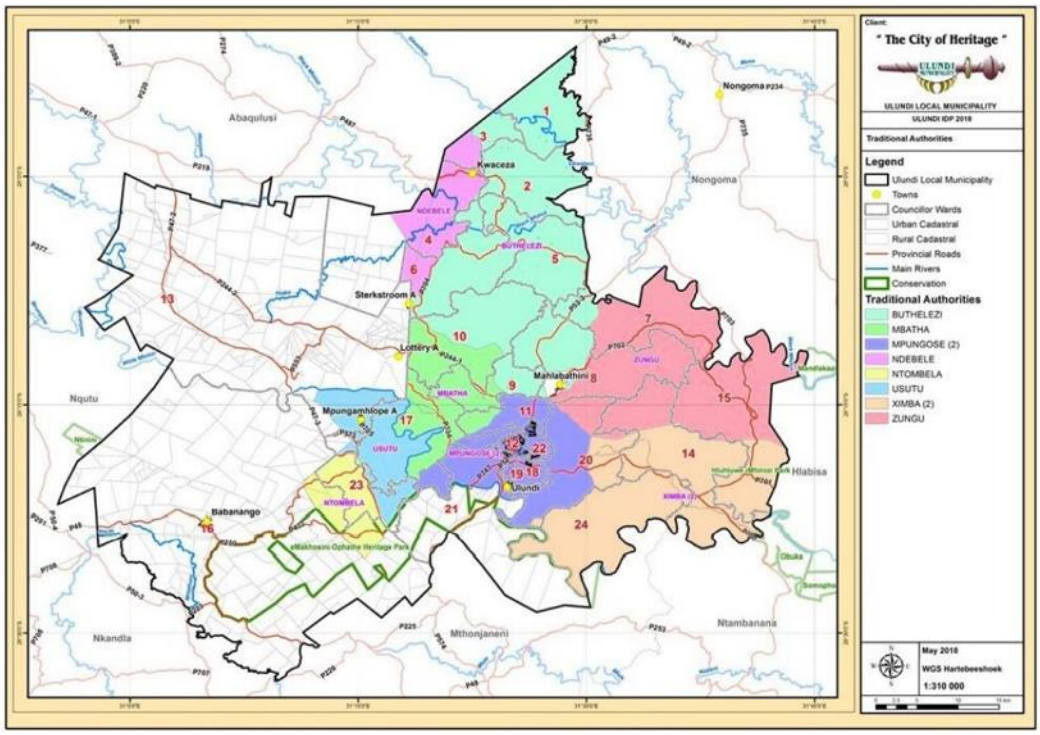

Figure 1.Traditional Authorities in Ulundi Local Municipality (Ulundi Local Municipality, 2018).

Due to its size, the topography of Ulundi LM varies depending on the location. In the western parts of the Ulundi LM, the mean elevation is around 1,600 m above sea level. In the central parts, the mean elevation is around 700 m above sea level. The eastern boundary is around 140 m above sea level. The western, mountainous region is divided by the White Mfolozi River into a northern and a southern area.

The slope gradient categories in Ulundi LM range from smaller than 1:10 (10% incline), 1:6 (17% incline) and 1:3 (33% incline) and steeper. Ward 24 is noted to have particularly steep slopes affecting the cost of construction of roads, pathways and other networks.

Ulundi LM has a mixture of two *precipitation sectors* which is linked to the varying topography within the municipal area. The two sectors average between 722 to 826 mm of rainfall per annum and 827 to 912 mm of rainfall per annum. There are selected pockets which have a higher average precipitation of 1,012 to 1,251 mm per annum. Average evaporation is varies in the municipal area with low-lying areas having an average of 1,801 to 2,000 mm per annum evaporation rate and the higher lying areas averaging 1,601 to 1,800 mm per annum.

The total population in Ulundi LM is 256,426 according to the district municipality WSDP (Zululand District Municipality, 2019). The ZDM has stated their household and population statistics differ (slightly higher) from the Stats SA 2016 Community Survey for Ulundi LM (Zululand District Municipality, 2019). The population size and household number is presented in the **Figure 2**. A larger percentage of households are headed by females as indicated by the Stats SA 2016 Community Survey (Stats SA, 2016). Ulundi unemployment rate is the second highest in ZDM (38.3%) with nearly a forth of the population within the Municipality living below the poverty line (Stats SA, 2016).

	Actual Household Statistics (Captured from aerial photography over 4 consequtive periods) vs CENSUS Data											
Local Municipality	2006	2009 (AERIALS)	2010	2011 (CENSUS)	2012	2013 (AERIALS)	2014	2015	2016 (COMM SURVEY)	2016 (AERIALS)	Annual household growth rate	Average Population per household	Total Population (ZDM)
AbaQulusi	36 069	40 302				45 918				47 119	0.9%	4.90	230 883
eDumbe	15 011	16 880				16 671				17 641	1.9%	5.10	89 969
Nongoma	34 056	38 171				45 670				44 376	-0.9%	4.40	195 254
Ulundi	35 309	37 365				46 450				44 987	-1.1%	5.70	256 426
uPongolo	22 098	25 136				28 468				29 519	1.2%	5.40	159 403
Total	**142 543**	**157 854**		**157 748**		**183 177**			**178 516**	**183 642**	**0.41%**	**5.10**	**931 935**

Figure 2. Population size and household number in the Zululand District Municipality. The total population size in Ulundi Local Municipality is 256,426 and the number of households is 44,987 (Zululand District Municipality, 2019).

Within Ulundi LM, there has been a positive growth surrounding Ulundi town areas with an overall slight negative growth in most of the rural areas between Ulundi and Nongoma (Zululand District Municipality, 2019).

The ZDM provides 4 levels of sanitation service within its jurisdiction (**Figure 3**). VIP latrines are considered as the minimum prescribed level or *basic supply* level within the municipality.

Service Level Number	Level of Sanitation Service	Definition	Free Basic Sanitation Policy
DS1	Water borne sewage	Unrestricted connection to municipal sewerage system	Included in free basic water allocation
DS2	Septic tank or similar facility	On-site disposal (self treatment)	No charge
DS3	Conservancy tank	Localised sewage temporary storage facility	No charge to selected households in specific areas as determined by the municipality, aligned to free basic water policy for service level DW4
DS4	Ventilated improved pit (VIP) latrine	Dry pit with sufficient capacity on-site disposal based on set standards	No charge

Figure 3. levels of service according to the Zululand District Municipality (Zululand District Municipality, 2019)

According to the ZDM WSDP, the Ulundi LM has water and sanitation backlog of 13% (5,801 households) and 7% (3,222 households), respectively, within the LM boundary (Zululand District Municipality, 2019). Within the WSDP, the ZDM planning takes into account the entire backlog of the district municipal area that also includes the proportion of each LM backlog of the entire district backlog (**Figure 4**). Further information can be in the ZDM WSDP (Zululand District Municipality, 2019).

SANITATION	TOTAL HOUSEHOLDS	BACKLOGS	% BACKLOGS in LM	% OF TOTAL BACKLOGS
AbaQulusi LM	47 119	8 098	17.19%	26.48%
eDumbe LM	17 641	1 288	7.30%	4.21%
Nongoma LM	44 376	10 755	24.24%	35.16%
Ulundi LM	44 987	3 222	7.16%	10.53%
uPhongolo LM	29 519	7 223	24.47%	23.62%
Total	**183 642**	**30 586**	**16.66%**	**100.00%**

Figure 4. Sanitation backlogs within Zululand District Municipality including Ulundi Local Municipality (Zululand District Municipality, 2019)

It was estimated that a capital investment of ZAR 3,3 billion and ZAR 1,2 billion is required to eradicate the water and sanitation backlog in ZDM, respectively. The provision of services is technically constrained due to sparsely populated and dispersed settlements, topography and poor quality of ground water increasing the cost of service delivery. There is also an unsustainable and increasing demand on the existing water infrastructure network. Ulundi LM being a predominantly rural municipality that has low employment rate, increased women and child-head households, and limited number of people with higher education qualifications. There is subsequently a relatively high rate of dependency on government grants and subsidies with more around half of the population dependent on some form of grant (Ulundi Local Municipality, 2018). Therefore, there is little no revenue is collection.

2 Service Outcomes

Service outcome analysis is based on secondary sources. The following key sources of data are used:

- Stats SA Community Survey (2016)
- IDP for ZDM 2017/2018 and 2018/2019
- Water Services Development Plan for ZDM (2017 – 2021)

Data on emptying and transport is not currently closely monitored, and is mostly qualitative in nature.

This SFD Intermediate Report has relied on data obtained from ZDM. Water and sanitation project budgets are approved by council based on backlogs and are included in *Integrated Development Plans* (IDPs) and *Water Service Development Plans* (WSDPs). Data on emptying and transport is not currently closely monitored and is mostly qualitative in nature.

2.1 Overview

This section presents the range of sanitation technologies/infrastructure, methods and services designed to support the management of FS and/or *wastewater* (WW) through the sanitation services chain in Ulundi LM. The details on the quantitative estimations are presented in Table 1 and the sections that follow.

Table 1: Sanitation technologies and contribution of excreta in terms of percentage of population

No.	Sanitation technologies and systems as defined by:		SFD reference variable	Percentage of population
	Zululand DM	SFD promotion initiative		
1	Toilet flushes directly to sewer	Toilet discharges directly to a centralised foul/separate sewer	T1A1C2	11%
2	Conservancy tank (plastic or concrete)	Fully lined tank (sealed), no outlet or overflow	T1A3C10	1%
3	*Ventilated Improved Pit* latrines (VIPs) – lined with cement blocks and open bottom	Lined pit with semi-permeable walls and open bottom	T1A5C10	53%
4	VIPs – unlined	Unlined pit	T1A6C10	28%
5	Not serviced (rural and informal)	No toilet, open defecation	T1B11C7 to C9	7%

2.1.1 Containment

There is a limited flush toilets network with the only off-site formal waterborne sewer system being linked to the Ulundi *Wastewater Treatment Works* (WWTW) with domestic effluent originating from the ZDM and associated truck-stop (T1A1C2 = 11% on Table 1).

As the targeted area includes a large rural component, the most common sanitation facility is VIP latrines. There are 37,741 VIPs (81% of the total population) installed by the municipality. The majority are lined with cement blocks and have an open bottom (defined under this SFD Lite as lined pit with semi-permeable walls and open bottom – T1A5C10 = 53% on Table 1).

The remainder are unlined VIPs (defined under this SFD Report as unlined pits – T1A6C10 = 28% on Table 1).

2.1.2 Emptying and Transport

There is no emptying strategy for tankers. Only conservancy tanks are emptied when they are full. The municipality utilised private tankers as well as municipal tankers. The municipality charges under ZAR 200 for vacuum tanker service (up to 5 kL) during normal weekdays. The cost is nearly ZAR 700 on weekends and on public holidays (Zululand District Municipality, 2019). During the development of this SFD Intermediate Report, we have not seen any costs / budget allocated to pit emptying. The ZDM WSDP has a three-phased approach with regards to sanitation service and it has been noted that Phase 3 includes replacement of old VIP-type latrines such as block- and zinc-type where pits are full and the top structure cannot be moved to a new location will be replaced with movable pre-cast units (Zululand District Municipality, 2019). This cost therefore falls under capital projects and not operating costs.

2.1.3 Treatment and Disposal

Ulundi town and surrounding areas are serviced by Ulundi WWTW. There is a total of 4 WWTWs at ZDM area. Details of WWTWs are presented below.

Table 2. Ulundi Local Municipality WWTWs according to ZDM officials

Name	Treatment type	Design Capacity (ML/day)	Flow (ML/day)	Sludge treatment	Sludge disposal/use
Ulundi WWTW	Conventional	2.5ML	3ML	None	Stock Piling
2 Hospitals Ponds	Oxidation Ponds	Unknown	Unknown	None	Stock Piling
Agricultural School	Oxidation Ponds	Unknown	Unknown	None	Stock Piling

Note: Data obtained from the Ulundi LM IDP 2011 – 2016 indicate that the 2 hospital received around 0.26 ML wastewater per day (Ulundi Local Municipality, 2011).

2.2 SFD Matrix

Table 3 presents the SFD Matrix for data collected from ZDM for the Ulundi LM in 2018. A description of the assumptions used in the SFD Matrix are presented in the following sections.

2.2.1 Off-site sanitation

According to municipal records, 11% of the population are serviced via off-site sanitation (T1A1C2 == 11% on Table 3). An estimated 90% of the wastewater from off-site sanitation is transported to the Ulundi WWTWs (W4a = 90% on Table 3), indicating a relatively low leakage of 10%, from the relatively new sewer pipes with low flows).

Once the wastewater reaches the WWTWs, it is treated to meet specified requirements. Considering the various flows per WWTW and associated overall effluent compliance per WWTW, an overall flow weighted compliance of more than 90% was provided by the municipality (W5a = 90% on Table 3).

Table 3: SFD Matrix for Ulundi LM (2018).

Ulundi, KwaZulu Natal, South Africa, 12 Nov 2018. SFD Level: 2 - Intermediate SFD Population: 256426 Proportion of tanks: septic tanks: 100%, fully lined tanks: 100%, lined, open bottom tanks: 100%						
Containment						
System type	Population	WW transport	WW treatment	FS emptying	FS transport	FS treatment
	Pop	**W4a**	**W5a**	**F3**	**F4**	**F5**
System label and description	Proportion of population using this type of system (p)	Proportion of wastewater in sewer system, which is delivered to centralised treatment plants	Proportion of wastewater delivered to centralised treatment plants, which is treated	Proportion of this type of system from which faecal sludge is emptied	Proportion of faecal sludge emptied, which is delivered to treatment plants	Proportion of faecal sludge delivered to treatment plants, which is treated
T1A1C2 Toilet discharges directly to a centralised foul/separate sewer	11.0	90.0	90.0			
T1A3C10 Fully lined tank (sealed), no outlet or overflow	1.0			100.0	80.0	90.0
T1A5C10 Lined pit with semi-permeable walls and open bottom, no outlet or overflow	53.0			0.0	0.0	0.0
T1A6C10 Unlined pit, no outlet or overflow	28.0			0.0	0.0	0.0
T1B11 C7 TO C9 Open defecation	7.0					

2.2.2 On-site sanitation

Containment

The total population served by on-site sanitation is 82%, see Table 1 for details.

Emptying and transport

The small fraction (1% of all households) who own conservancy tanks all have these serviced privately or a request is made to the municipality to empty them (F3 for T1A3C10 = 100% on Table 3). Furthermore, for the purposes of this SFD report, ZDM estimate that 80% of the emptied faecal sludge is delivered to treatment.

There is no strategy to empty the VIPs when they are full. These facilities are covered and closed when full, and a new facility constructed (F3 = 0% for systems T1A5C10 and T1A6C10 on Table 3). This is still an issue as the strategy is currently being developed as indicated by ZDM officials.

Treatment

The relatively small quantity of faecal sludge emptied from the conservancy tanks and delivered to the Ulundi WWTWs is co-treated with wastewater. No data is available on sludge treatment. For the purposes of this SFD report, it is assumed the proportion of faecal sludge

treated in compliance with local standards is similar to the effluent compliance described in section 2.3.1 (F5 = 90% on Table 3).

2.2.3 Open defecation

Of the current population, 7% uses open defecation (OD = 7% on Table 3). This is considered the sanitation backlog and needs to be addressed. This data reported by ZDM officials is in line with that reported in the WSDP (Zululand District Municipality, 2019).

2.2.4 Risk of groundwater contamination

Water for urban areas of Ulundi LM is supplied from the Ulundi drinking-water treatment plant via pipeline to households with the majority of households either receiving water via household taps or yard connections. Raw water is obtained from the White Umfolozi River (i.e. surface water).

Rural areas (outside of the urban boundary) are reliant on groundwater sources and as little/no treatment is noted, protection of these water sources is essential. Although the groundwater is not presently being used in Ulundi urban areas, climate change impacts and the increasing water scarcity facing many parts of South Africa and the KwaZulu Natal province.

There is a need to create awareness among the rural people about the need to ensure that pit latrines/VIPs are adequately sealed when closed/moved/new pit dug, and of the effects of using potentially polluted water. The ZDM has a criterion system for evaluating ground water pollution based on distance of infrastructure to downstream ground water. This criterion system is used in its implementation projects and can be viewed in the ZDM WSDP (Zululand District Municipality, 2019).

2.2.5 Data assumptions

The SFD graphic was developed in 2018 for Ulundi LM based on data provided by the ZDM. Data for the SFD Matrix and subsequent SFD graphic was obtained from ZDM. Data was also sourced from the municipal IDP (and WSDP) and Stats SA data sources. The number of households used in this SFD Intermediate Report was 46,398 and higher than the 44,987 reported in the WSDP. As discussed previously, ZDM undertakes it own data collection survey and the data presented herein represents the most up-to-date figures. The ZDM have acknowledged that the Stats SA data does not correspond to their own data set and have elaborated for reasons within the WSDP (Zululand District Municipality, 2019). The actual figures relating to different types of sanitation facilities is not well documented within the ZDM IDP and WSDPs and represents an area of improvement for reporting purposes.

2.3 SFD Graphic

Based on the above data, estimates and assumptions, the SFD graphic illustrates that 91% of excreta is safely managed in Ulundi LM (Figure 5).

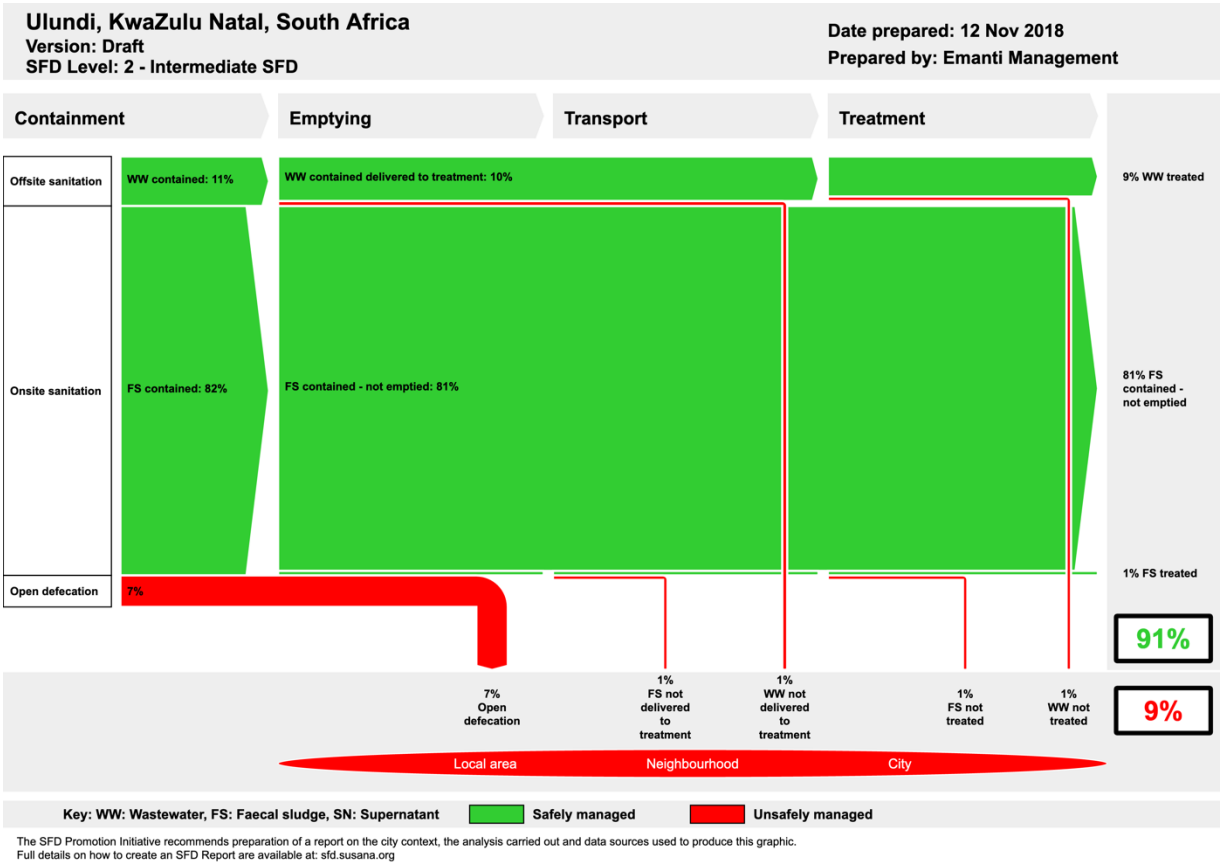

Figure 5. SFD Graphic for Ulundi Local Municipality (2018).

The majority of the population of Ulundi LM utilise on-site sanitation systems, specifically VIP latrines (82% on-site sanitation on Figure 5), only 11% of the population are connected to off-site sanitation and 7% practice open defecation.

The safely managed sanitation is predominantly faecal sludge that is not emptied and remains contained in the VIPs (81% FS contained - not emptied on Figure 5). This excreta is safely managed but it is important to note that while contained for the moment, the VIPs are not being emptied and that there is no pit emptying strategy in place. There is a need to balance capital infrastructure roll-out with an effective on-site sanitation maintenance strategy.

The balance of the safely managed excreta is mainly wastewater delivered to treatment and treated (9% WW treated on Figure 5) through the relatively small sewerage network. Only 1% of the safely managed is from faecal sludge emptied from the tanks, delivered to treatment and treated (1% FS treated on Figure 5).

And only 9% of excreta from the whole population is estimated to be unsafely managed. The majority of which is from open defecation (7% open defecation on Figure 5).

3 Service delivery context

This section provides the service delivery context.

3.1 Policy, legislation and regulation

This section provides an overview of policy, legislation and regulation related to sanitation services.

Constitution of the Republic of South Africa (1996)

Section 24(a), Bill of Rights in the Constitution states that “everyone has a right to an environment that is not harmful to their health or well-being” and 24(b) “to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that (i) prevent pollution and ecological degradation, (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.” (Constitution of the Republic of South Africa, 1996)

Section 27(1)(b) of the Bill of Rights in the Constitution states that “everyone has the right to have access to sufficient food and water”.

Section 27(2) tasks the state to “take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation” to ensure access to basic water supply (Constitution of the Republic of South Africa, 1996)

These clauses have often been interpreted as implying a right to basic sanitation for all. Water and sanitation are intrinsically linked. All spheres of government are tasked with the responsibility to ensure that these basic water supply and sanitation services are provided.

Water Supply and Sanitation Policy (1994)

With democracy in 1994, the newly formed *Department of Water Affairs and Forestry* (DWAF) - subsequently renamed the *Department of Water Affairs* (DWA) and then more recently *DWS* – developed the White Paper on Water Supply and Sanitation Policy (1994). The White Paper provided the institutional framework for water and sanitation services which was subsequently legislated in the Water Services Act (1997) (Tissington, 2011).

The White Paper noted that full waterborne sewerage was not technically feasible and that VIPs, if constructed to agreed standards and maintained properly, would provide an appropriate and adequate basic level of sanitation service. Thus, a well-constructed VIPs would be classified as an adequate basic provision (Department of Water Affairs and Forestry, 1994). Policy principles from this documented were mirrored in the later White Paper on Basic Household Sanitation (2001) (Tissington, 2011).

National Sanitation Policy (1996)

The National Sanitation Policy of 1996 defines sanitation as "the principles and practices relating to the collection, removal or disposal of human excreta, refuse and waste water, as they impact upon users, operators and the environment." This White Paper was developed by the National Sanitation Task Team as a policy document that is complemented by an implementation strategy (National Sanitation Task Team, 1996). The 1996 National Sanitation Policy followed the 1994 White Paper on Water Supply and Sanitation Policy. The document noted that sanitation is more than building toilets and includes behavioural aspects including hygiene and community involvement. The document noted that the provision of household sanitation is the responsibility of the householders. Local government plays a role to help make this possible with support from provincial and national government spheres. The document listed the main types of sanitation systems used in South Africa and provided criteria for implementation. Bucket toilets and traditional pit toilets (without ventilation and fly screen) were not considered appropriate sanitation. The minimum acceptable level of basic sanitation stated by the then DWA (now DWS) is the VIP latrine (National Sanitation Task Team, 1996).

Water Services Act (1997)

The *Water Services Act* (Act 108 of 1997) is the primary law relating to the provision of water services including sanitation supply to households and other municipal users.

Section 3 of the Water Services Act of 1997 states that:
"(1) Everyone has a right of access to basic water supply and basic sanitation.
(2) Every water services institution must take reasonable measures to realise these rights.
(3) Every water services authority must, in its water services development plan, provide for measures to realise these rights.
(4) The rights mentioned in this section are subject to the limitations contained in this Act".

Basic sanitation is defined in the Water Services Act of 1997 as:
"the prescribed minimum standard of services necessary for the safe, hygienic and adequate collection, removal, disposal or purification of human excreta, domestic waste water and sewage from households, including informal households".

The 1997 Water Services Act defined the role of WSAs and other water institutions such as WSPs and water boards. According to section 12, WSAs are obliged to prepare and adopt a WSDP for its areas of jurisdiction. The WSDP shall also prioritise and include how the WSA intends of improving access to basic water and sanitation services should it not be able to deliver on these obligations:

"Every draft water services development plan must contain details:

(a) of the physical attributes of the area to which it applies;
(b) of the size and distribution of the population within that area;
(c) of a time frame for the plan. including the implementation programme for the following five years;
(d) of existing water services;
(e) of existing industrial water use within the area of jurisdiction of the relevant water services authority:
(f) of existing industrial effluent disposed of within the area of jurisdiction of the relevant water services authority;
(g) of the number and location of persons within the area who are not being provided with a basic water supply and basic sanitation;
(h) regarding the future provision of water services and water for industrial use and the future disposal of industrial effluent. including—
  i. the water services providers which will provide those water services;
  ii. the contracts and proposed contracts with those water services providers;
  iii. the proposed infrastructure necessary;
  iv. the water sources to be used and the quantity of water to be obtained from and discharged into each source;
  v. the estimated capital and operating costs of those water services and the financial arrangements for funding those water services, including the tariff structures;
  vi. any water services institution that will assist the water services authority;
  vii. the operation, maintenance, repair and replacement of existing and future infrastructure;
(i) of the number and location of persons to whom water services cannot be provided within the next five years setting out –
  i. the reasons therefor: and
  ii. the time frame within which it may reasonably be expected that a basic water supply and basic sanitation will be provided to those persons; and
(j) of existing and proposed water conservation, recycling and environmental protection measures"

Notice is expected to be given to municipal users of the drafting of the WSDP with the draft expected to undergo stakeholder consultation and therefore sent to the Minister, the Province and neighbouring WSAs.

Municipalities also have to develop an IDP to organise and budget for its development plans for its area of jurisdiction. The IDP is done in conjunction with various stakeholders including the municipality, councillors, communities and national and provincial sector departments which be affected at any stage of the plan. The WSDP must form part of the municipality's IDP and it is expected that WSAs report on its implementation during each financial year (Republic of South Africa, 1997).

The National Water Act (1998)

The National Water Act (Act 36 of 1998) (NWA) defines how water resources are protected, used and managed. Amendments to the Act have been undertaken in 1999 (Act 45) and 2014 (Act 27). The Act governs how wastewater may be returned to the environment and the requirement of a Water Use Authorisation (Section 40) for the disposal of sewage sludge and thus faecal matter. Furthermore, the Act might require a General Authorisation for the application of sludge if this is not part of the WWTW Water Use License (National Water Act 36, 1998).

Municipal Systems Act (2000)

The Municipal Systems Act 32 (2000) provides the framework to enable municipalities to: achieve development targets and ensure universal access to essential services that are affordable to all. The Act defines what is a municipality and defines it role. It further indicates how services may be undertaken through a local municipality or district municipality and the procedures required to do so (Act 33 of 2000).

Municipalities are obliged to develop and adopt an IDP. Th IDP forms the policy framework and basis by which budgets are developed. Municipal planning has to be developmentally oriented.

Section 26 of the Municipal Systems Act (2000) states:
"An integrated development plan must reflect—

(a) the municipal council's vision for the long term development of the municipality with special emphasis on the municipality's most critical development and internal transformation needs;
(b) an assessment of the existing level of development in the municipality, which must include an identification of communities which do not have access to basic municipal services;
(c) the council's development priorities and objectives for its elected term, including its local economic development aims and its internal transformation needs;
(d) the council's development strategies which must be aligned with any national or provincial sectoral plans and planning requirements binding on the municipality in terms of legislation;
(e) a spatial development framework which must include the provision of basic guidelines for a land use management system for the municipality;
(f) the council's operational strategies;
(g) applicable disaster management plans;
(h) a financial plan, which must include a budget projection for at least the next three years; and
(i) the key performance indicators and performance targets determined in terms of section 41".

Each district municipality, within a prescribed period after the start of its elected term and after following a consultative process with the local municipalities within its area, must adopt the IDP. The IDP will remain in effect until a new IDP is adopted by the next elected council (Republic of South Africa, 2000).

White Paper on Basic Household Sanitation (2001)

The White Paper on Basic Household Sanitation aimed to improve on National Sanitation Policy of 1996 and incorporated the knowledge gained in actual implementation of the sanitation programmes since then. The White Paper articulated the Government policies on sanitation, highlighted the impact sanitation of the public and provide a framework for the implementation and monitoring of sanitation programmes with greater coherence and co-ordination amounts different spheres of government (Department of Water Affairs and Forestry, 2001). The focus of the policy was on the provision of basic sanitation facilities to mostly rural and informal settlements.

The principles to guide the policy and intervention strategies as stated in the White Paper:
“

1. **Sanitation improvement must be responsive to the demands of the people and supported by an intensive Health and Hygiene Programme.**
   Household sanitation is first and foremost a household responsibility. For users to benefit maximally, they must also understand the link between their own health, good hygiene and toilet facilities.
2. **Community participation**
   Communities must be fully involved in projects that relate to their health and wellbeing, and also in decisions relating to community facilities such as schools and clinics. Communities must participate in decision making about what should be done and how; must contribute to the implementation of the decisions and must share in the benefits of the project or programme.
3. **Integrated planning and development**
   The health, social, and environmental benefits of improved sanitation are maximised when sanitation is planned for and provided in an integrated manner along with water supply and other municipal services.
4. **Sanitation is about environment and health**
   Sanitation improvement must be accompanied by activities promoting health, hygiene and the environment.
5. **Basic sanitation is a human right**
   Government has an obligation to create an enabling environment through which all South Africans can gain access to basic sanitation services.
6. **To provide access to sanitation services.**
   Local government has the constitutional responsibility to provide sanitation services.
7. **Access to sanitation for all**
   Those with the greatest health risk due to poor sanitation must be assisted first.
8. **Equitable regional allocation of development resources**
   The limited national resources available to support the incremental improvement of sanitation services should be equitably distributed throughout the country according to population, level of development, and the risk-to-health of not supporting sanitation improvement.
9. **Water has an economic value**
   The way in which sanitation services are provided must take cognisance of the growing scarcity of good quality water in South Africa.
10. **Polluter pays principle**
    Polluters must pay for the cost of remediation of the effects on the environment of the pollution they create.

11. **Sanitation services must be financially sustainable.**
    Sanitation services must be sustainable both in terms of capital (input) costs and recurrent (ongoing service) costs.
12. **Environmental integrity**
    The environment must be protected from the potentially negative impacts of badly designed sanitation systems" (Department of Water Affairs and Forestry, 2001).

The strategic interventions include many aspects including community participation, health and hygiene awareness education, adopting environmental management in approach, upgrading of facilities, utilising common approaches including technical options for implementation and undertaking specific programmes for eliminating backlogs (Department of Water Affairs and Forestry, 2001). The IDPs as seen as the mechanism for prioritisation and co-ordination of service delivery. The White Paper stated that the IDPs must contain at least the following:

- the existing service levels available to households;
- proposed new service levels per household;
- health and hygiene education to be provided;
- the estimated capital and recurring costs of providing these services;
- the cost to households for service payments;
- the availability of grant funding;
- the implications for the overall municipal budget; and
- how the service impact of the investment will be measured and monitored.

In 2001, the DWAF produced a summary of the 2001 White Paper on Basic Household Sanitation (Department of Water Affairs and Forestry, Sanitation for a Healthy Nation: Summary of the White Paper on Basic Household Sanitation). The document showed the linkage between the IDP, WSP and the Sanitation Plan for a municipality. The WSDP is a component of the IDP and the universal sanitation coverage of at least a minimum basic level of sanitation by the target date is a requirement of the policy and must be committed to in the IDP (see Figure below).

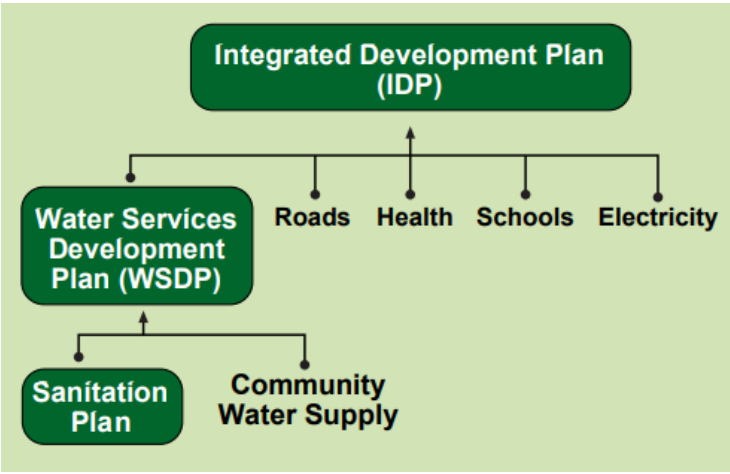

Figure 6. Interlinking of the IDP, WSDP and Sanitation Plan (Department of Water Affairs and Forestry, Sanitation for a Healthy Nation: Summary of the White Paper on Basic Household Sanitation)

Strategic Framework for Water Services (2003)

The 2003 Strategic Framework for Water Services was approved by Cabinet in September 2003 to address the challenges in water and sanitation sector since democracy in 1994 and the adoption of new legislation since. The framework was developed through a consultative process involving the *Department of Provincial and Local Government* (DPLG), the *South African Local Government Association* (SALGA) and the *South Africa Association of Water Utilities* (SAWU). The framework was devised to guide the water sector with policies, legislation and strategies aligned and the framing of 7 sector goals, including that all citizens in South Africa must have access to appropriate, acceptable, safe and affordable basic water and sanitation supply. Eliminating the backlog was a key theme and the target at the time of the framework was to exceed to Millennium Development Goals (Department of Water Affairs and Forestry, 2001).

National Sanitation Strategy (2005)

The National Sanitation Strategy of 2005 was prepared through the DWAF and the National Sanitation Task Team. The strategy incorporates the strategies of other stakeholders including SALGA and the Provincial Sanitation Task Teams. The vision of the strategy was to co-ordinate resources at all government spheres to achieve universal sanitation by 2010. The strategy builds upon the 2003 Strategic Framework for Water Services and sought to increase priority and resources in sanitation implementation programmes by local authorities. The strategy examines various aspects of the delivery of sanitation including current bottlenecks and makes proposals for accelerating the delivery in order to meet the 2010 national target. The sanitation strategy states that no sanitation systems lower than a VIP latrine should be implemented and that bucket toilets should be eradicated with the WSA having the key responsibility of sanitation delivery. The WSA is required to develop a Free Basic Sanitation programme (Department of Water Affairs and Forestry, 2005).

Free Basic Sanitation Implementation Strategy (2008)

The 2003 Free Basic Sanitation Implementation Strategy was developed to guide WSAs in the implementation of the National Free Basic Sanitation Policy. The DWAF acknowledged that the 2010 target of universal sanitation access would not be achieved given the challenges faced by WSAs in sanitation service delivery. A revised target of 2014 was set and in line with the Department of Housing target of all citizens having access in 2014. The definition of Basic Sanitation remained unchanged from the 2003 Strategic Framework for Water Services. The strategy adopts the principles that national guidelines should be implemented by local conditions and choice allowing flexibility in the implementation approach. Community participation is as seen as key aspect for long-term success. The primary intended beneficiaries of the strategy are poor households with the most practical indicator of poverty being household expenditure. The document provides guidance of the term *free basic sanitation* and noted that whole national policy is to provide free basic sanitation to the poor, many WSAs are financially constrained and in such cases, they may pace cap on the free basic sanitation grant and require beneficiaries to contribute in cash or kind. However, citizens should no receive sanitation facilities below the basic minimum level and should be included the WSAs Free Basic Sanitation Policy (Department of Water Affairs and Forestry, 2008).

National Sanitation Policy (2016)

The DWS (renamed in 2014) developed the 2016 National Sanitation Policy through a consultative process. The document provides policy positions to address the policy gaps and challenges as indicated through the stakeholder consultation process. It also includes country's new national and international development imperatives. The document adopts many of the strategic policy positions outlined by the 2003 Strategic Framework for Water Services.

3.2 Planning

The ZDM has backlog figures noted in its municipal IDP. Budget allocations and total estimated funding requirements are presented in the next section.

3.3 Equity

3.3.1 Current choice of services for the urban poor

VIP latrines are used as a minimum level of service outside the sewered boundaries.

3.3.2 Plans and measures to reduce inequity

The plans are outlined in the ZDM IDP and WSDP. ZDM has a prioritisation model that is applied for water and sanitation implementation since 2002. The prioritisation models serve to prioritise settlements and project implementation in an unbiased, objective manner and are based on a weighted criteria method up to a score of 100 (higher score indicates higher priority). In addition, the ZDM has a *Rural Sanitation Implementation Model* that has 3 phases. The first 2 phases involves providing sanitation to those settlements which have not received any form of sanitation from previous projects. The third and last phase initiated around 2017 serves to replace old VIP-type structures, especially Archloo-type and immovable block- and zinc-style VIPs.

ZDM estimates that it requires ZAR 1.2 billion in terms of capital investment to achieve universal access and to implement and upgrade existing sanitation facilities. An estimated ZAR 350 million is required for new implementation projects (provide VIP latrines to previously unserved). The full list of planned new implementation projects can be viewed in the WSDP. The replacement cost of old VIP-type structures is 1.5 times more than the new implementation project budget (around ZAR 552 million) (Zululand District Municipality, 2019).

3.4 Outputs

3.4.1 Capacity to meet service needs, demands and targets

The ZDM was made a WSA in 2003 as part of the division of powers and functions amongst municipalities. This resulted in a Section 78 investigation to be done to determine the most appropriate water services provider arrangements to provide water services in the district at the time and in the future. This report is available on the ZDM website - www.zululand.org.za. The investigation began with determining the status quo with water services provision in the DM at the time, undertaking an asset survey, compiling all costs related to water services, and drafting staff organograms with vacant positions. A scenario model was developed and based on the model outputs, it was decided that ZDM create an internal department that is responsible for water services throughout the DM. A summary of decision-making process can be viewed in the WSDP (Zululand District Municipality, 2019).

3.4.2 Monitoring and reporting access to services

This has been previously discussed in this SFD Intermediate Report and it includes data from Stats SA and the municipal IDPs and district WSDP.

4 Stakeholder Engagement

The relevant ZDM staff were contacted through e-mail, letter and telephone call prior to the visit to the municipality. The purpose of the SFD study and depth of data required was conveyed through an introductory letter to respective staff. Although a number of stakeholders of government departments were noted, this SFD study aimed to focus on interviews with staff from ZDM.

Interviews were held with the Manager Water Services and Technical Officer, who also accompanied the team to the site inspection. Process controllers at the Ulundi WWTW and other personnel were also communicated with.

A site inspection assisted with verifying data obtained from ZDM published reports (e.g. IDP, WSDP). The key informant interviews and data collected helped in understanding the existing situation and upcoming developments plans in the sanitation sector.

5 Acknowledgements

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7 Appendix

7.1 Appendix 1: Stakeholder identification

Table 4: Stakeholder identification

No.	Stakeholder group	In Zululand District context
1	City council / Municipal authority / Utility	Water Services Authority (WSA): Zululand District Municipality Water Services Provider (WSP): Zululand District Municipality
2	Ministry in charge of urban sanitation and sewerage	National: Department of Water and Sanitation Provincial: Department of Water and Sanitation (KwaZulu-Natal)
3	Ministry in charge of urban solid waste	National: Department of Environmental Affairs Provincial: Department of Economic Development, Tourism and Environmental Affairs of KwaZulu-Natal (EDTEA)
4	Ministry in charge of urban planning, finances and economic development	National: Department of Human Settlements Provincial: KwaZulu-Natal Department of Human Settlements National: National Treasury Provincial: KwaZulu-Natal Provincial Treasury Provincial: Department of Economic Development, Tourism and Environmental Affairs of KwaZulu-Natal (EDTEA)
5	Ministry in charge of environmental protection	National: Department of Environmental Affairs Provincial: Department of Economic Development, Tourism and Environmental Affairs of KwaZulu-Natal (EDTEA)
6	Ministry in charge of health	National: Department of Health Provincial: KwaZulu-Natal Department of Health
7	Service provider for construction of on-site sanitation technologies	Various, by tender appointment
8	Service provider for emptying and transport of faecal sludge	Various, by tender appointment
9	Service provider for operation and maintenance of treatment infrastructure	N/A
10	Market participants practicing end-use of faecal sludge end products	N/A
11	Service provider for disposal of faecal sludge (sanitary landfill management)	N/A
12	External agencies associated with faecal sludge management services (e.g. NGOs, academic institutions, donors)	N/A

7.2 Appendix 2: Tracking of Engagement

Table 5: Tracking of stakeholder engagement

Name of organization	Name of contact person	Designation	Date of engagement
Zululand District Municipality	X. Buthelezi	Technician	19th Oct 2018
Zululand District Municipality	S. Ngubane	DD: Technical Services	29th and 30th Oct 2018
Zululand District Municipality	S. Ngcobo	Technician (WSA)	29th and 30th Oct 2018
Zululand District Municipality	D. Myaka	Senior Process Controller	29th Oct 2018
Zululand District Municipality	B.M. Gasa	Superintendent	29th Oct 2018
Zululand District Municipality	L.E. Mbatha	Process Controller	29th Oct 2018
Zululand District Municipality	T. D. Mdlalose	Superintendent	29th Oct 2018

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