RE-ADVERTISEMENT

QUOTATIONS ARE HEREBY REQUESTED IN ACCORDANCE WITH THE SCM REGULATIONS SECTION 18 OF THE LOCAL GOVERNMENT MUNICIPAL FINANCE ACT 56 OF 2003, FOR THE PURCHASE OF ITEM/S THAT COULD BE ABOVE R30 000.00 UP TO A TRANSACTION VALUE OF R200 000, 00 (INCLUDING VAT).

SUPPLY & INSTALLATION OF A VHF RADIO COMMUNICATION SYSTEM

DATE OF ADVERTISEMENT	16 MAY 2018
DATE OF CLOSING	24 MAY 2018 AT 12H00
DETAILS OF BIDDER	
FULL NAME	
ADDRESS OF BIDDER	
ID NUMBER (SOLE PROPRIETOR) COMPANY OR CC NUMBER	
REGISTRATION NUMBER (PTY) LTD	
TAX REFERENCE NUMBER	
VAT REGISTRATION NUMBER (IF ANY)	
CONTACT PERSON	
ALTERNATIVE CONTACT PERSON	
TELEPHONE NUMBER	
CELL PHONE NUMBER	
FAX NUMBER	

Must be completed in full

QUOTATIONS MUST BE SUBMITTED IN SEALED ENVELOPES CLEARLY MARKED **"SUPPLY & INSTALLATION OF A VHF RADIO COMMUNICATION SYSTEM"** TO THE QUOTATION BOX SITUATED AT:
SUPPLY CHAIN MANAGEMENT OFFICE (LESEDI OFFICES)
C/O LOUW AND HF VERWOERD STREET
HEIDELBERG
1441

ALL ENQUIRIES REGARDING TECHNICAL INFORMATION SHOULD BE REFERRED TO MR SYDNEY ZWANE AT (016) 492 0076 OR MS SIBULELO NXATHI@ 016 492 0202 WITH REGARDS TO THE BIDDING PROCEDURE.

DEPARTMENT: CORPORATE SERVICES

The following information must be submitted with the quotation, failure in submitting these documents will result in a quotation being disqualified:

- Original tax clearance certificate/Pin Provided by Sars
- Forms listed below (MBD 2,MBD 4,MBD 6.1,MBD 8,MBD 9, Clearance Certificate for Water & Lights)
- Latest Municipal Account
- CSD registration report

Bidders who did not submit an original or certified copy of their BBBEE Certificate will not be allocated preference points and will only be evaluated on price.

EVALUATION CRITERIA: 80/20 Preference point system as presented in the preferential procurement policy framework Act no 5 of 2000, for this purpose the MBD 2, MBD4, MBD 6.1, MBD 6.2, Annex C, MBD 8 MBD 9 and the Clearance Certificate for Water & lights can be downloaded from our website on the following link: **www.lesedilm.gov.za/key/scm** MBD forms should be scrutinized, completed and submitted together with your quotation. All objectives and complains must be lodged within 14 days and in writing to the municipal manager's office.

All bidders must ensure that they are registered on the National Treasury Central Supplier Database via the following link:business.support@csd.gov.za. No business will be conducted with any person who is not registered on this database.

BIDDERS ARE WELCOME TO ATTEND THE OPENING ON THE CLOSING DATE

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1 INTRODUCTION

The two way radio communications system based on internationally accepted standards is intended to be used for mission critical voice and data communication by the Lesedi Local Municipality. Any other proprietary standard or system shall not be adopted for the project.

The two way radio network will be used for mission critical communications and for the coordination of municipal functions including but not limited to the traffic department, Electricity department etc.

Due to the mission critical nature of the two way radio system, the winning bidder should have a minimum of two (2) Tier 3 OEM certified technicians in their employment and proof must be provided with the submission.

The product offered in this bid **must** comply with the below requirements and features. Failure to comply with the below requirements and features will result in disqualification.

2 GENERAL REQUIREMENTS ON THE VHF RADIO SYSTEM

The VHF radio system shall be in compliance with the essential requirements and other relevant provisions of relevant European Council Directives. This comprises CE marking for the goods.

The equipment must comply with the requirements set-out in the standards and publications

The system shall Support voice and data services.

An open radio infrastructure application interface shall be provided to access the system's services and features and thus provide enhanced functionality (value add) by the connected applications, e.g. dispatcher, PSTN gateway, voice recording.

The network shall easily be expandable in terms of coverage (increasing the number of repeaters, dispatchers), and gateway interfaces.

Expansions of the network shall be possible without removal of present repeaters or network management facilities.

3 STANDARDS

The Radio Communication Network shall use the new generation of digital mobile radio system complying with international standards as developed by ETSI (European Telecommunication Standard Institute) for Private Mobile Radio (PMR).

The equipment must comply with the requirements set-out in the standards and publications mentioned below.

1） ETSI DMR Tier 2 Open Standard
2） ETSI EN 300 113-2 V1.4.2(2009-11)
3） ETSI EN 301 489-5 V1.3.1(2002-8)
4） ETSI EN 301 489-1 V1.8.1(2008-4)

4 FEATURE REQUIREMENT

4.1 Portable/Handheld radio features

To ensure mission-critical yet user-friendly operation, the voice group call set-up time shall be less than 500 milliseconds within the operational area of repeaters.

4.1.1 General requirements

Radios should support both analogue mode and digital mode.

Support upgrading to MPT/DMR Tier 3 trunking mode through software.

Terminals should support scrambling/compandor/squelch in Analogue Mode.

Support Channel notification customization.

Support power on animation customization.

Support switching knob and buttons Lock.

Power on ID input should be supported, which enable different users to use their own ID to power on the radio (the subscriber will not power up until the user enters the valid radio ID)

Terminals support roaming between different repeaters.

Users can configure the frequently used contacts that are correlated to the Contact List into the Favorite Contact List for the user.

Different alert tone can be defined for different services such as group call tone, power on tone, etc.

Radio Alias Displaying During Power-on Progress

4.1.2 Voice features

Terminals should support all call, individual call, and group call.

Terminals should support Transmitter Time Out Timer (TOT).

The receiving party should support vibration indication function when receiving an individual call or group call.

Terminals could automatically choose an idle timeslot for communication from 2 timeslots. For example, radio A can call through timeslot 1; when timeslot 1 is occupied by other radios' communication, another call can be made through timeslot 2 by the same radio A.

Terminals should be capable to scan analogue channels and digital channels at any physical channel.

Terminals should support low and high power transmission switching.

Terminals should support One touch call

Support wireless earpiece accessory.

Support making phone calls via DTMF signalling

The radios can display the contact's ID and alias alternatively during a call.

Support at least 64 receiving group configuration in one receiving group list.

4.1.3 Data features

Terminals should support supplementary service including alert call, remote monitor, radio enable/disable, radio check.

Terminals should support Radio Disable, Radio Enable, Remote Monitor and OTAP shall be authentication controlled.

Terminals should support text message up to 256 characters.

Terminals should support built-in GPS and GPS messages to show your grid in a message.

Terminals should support One touch message.

Terminals with display and GPS can poll direction and distance of another terminal with GPS.

4.1.4 Encryption requirements

Terminals should support DMRA encryption.

40bit, 128bits, 256 bits basic and advanced encryption in Digital Mode should be supported.

Advanced encryption adopts ARC4 algorism for 40bits, or AES algorism for 128 bits, 256 bits.

Terminals should support random key encrypt so that the subscriber will encrypt its transmitted voice or data by selecting an encrypt key randomly from the Encrypt Key List in the CPS. Then the receiving party will need MultiKey Decrypt to receive the call.

Terminals should support dongle software which is an encryption application used to define and manage the keys for end-to-end-encryption. The keys are protected and can be defined and modified only when using a dongle and password. Others without this dongle cannot do anything related to encryption.

4.1.5 Safety requirements

Terminals should support both Digital and Analogue Emergency, including emergency type: Siren Only, Regular, Silent and Silent with Voice.

Support Lone worker.

4.2 Mobile radio features

To ensure mission-critical yet user-friendly operation, the voice group call set-up time shall be less than 500 milliseconds within the operational area of repeaters.

4.2.1 General requirements

Radios should support both analogue mode and digital mode.

Terminals should support upgrading to MPT/DMR Tier 3 trunking mode through software.

Terminals should support scrambling/compandor/squelch in Analogue Mode.

Support Channel voice notification customization.

Support Power on animation customization.

Power on ID input should be supported, which enable different users to use their own ID to power on the radio (the subscriber will not power on until the user enters the valid radio ID).

User could configure parameters through radio menu, including Frequency, Slot, Color Code, CTCSS/CDCSS, TX contact name Rx Group List, Radio Alias, Radio ID.

Terminals support roaming between different repeaters.

Users can configure the frequently used contacts that are correlated to the Contact List into the Favorite Contact List for the user.

Different alert tone can be defined for different services such as group call tone, power on tone, etc.

Radio Alias Displaying During Power-on.

4.2.2 Voice features

Terminals should support all call, individual call, and group call.

Terminals should support Transmitter Time Out Timer (TOT).

Terminals could automatically choose an idle timeslot for communication from 2 timeslots. For example, radio A can call through timeslot 1; when timeslot 1 is occupied by other radios' communication, another call can be made through timeslot 2 by the same radio A.

Terminals should be capable to scan analogue channels and digital channels at any physical channel.

Terminals should support low and high power transmission switching.

Support One touch call

Support making phone calls via DTMF signalling.

The radios can display the contact's ID and alias alternatively during a call.

Support at least 64 receiving group configuration in one receiving group list.

4.2.3 Data features

Terminals should support supplementary service including alert call, remote monitor, radio enable/disable, radio check.

Terminals should support Radio Disable, Radio Enable, Remote Monitor and OTAP shall be authentication controlled.

Support text message up to 256 characters.

Terminals should support built-in GPS and GPS messages to show your grid in a message.

Support One touch message.

Terminal with display and GPS can poll direction and distance of another terminal with GPS.

DMRA data service including short message, GPS, encryption should be supported.

4.2.4 Encryption requirements

40bit, 128bits, 256 bits basic and advanced encryption in Digital Mode should be supported.

Terminals should support Advanced encryption adopts ARC4 algorism for 40bits, or AES algorism for 128 bits, 256 bits.

Support random key encrypt so that the subscriber will encrypt its transmitted voice or data by selecting an encrypt key randomly from the Encrypt Key List in the CPS. Then the receiving party will need MultiKey Decrypt to receive the call.

Support keyloader software which is an encryption application used to define and manage the keys for end-to-end-encryption. The keys are protected and can be defined and modified only when using a dongle and password. Others without this keyloader dongle cannot do anything related to encryption.

4.2.5 Safety requirements

Terminals should support both Digital and Analogue Emergency, including emergency type: Siren Only, Regular, Silent, and Silent with Voice.

Terminals should support Lone worker.

4.3 Networking requirements

4.3.1 General requirements

There should be one or more repeaters in the system to enlarge the radio signal coverage area.

Repeaters must support both analog mode and digital mode, compatible with traditional analog radios.

Repeaters should support mixed channels for both analog and digital users.

Repeaters should support a group of analog channels working in scan mode to improve the device service efficiency.

Repeaters should support software upgrade to MPT/DMR trunking transceiver

Repeaters should support software upgrade to simulcast transceiver

The system should support connection between analog repeater and digital repeater.

There should be a colour display console in the repeater for configuration and working status check.

Repeaters should support power on animation customization.

There should be no less than 4 programmable keys in the repeater

Repeaters should support internal duplexer installation and external duplexer installation.

Repeaters should be installed in standard 19 inch rack with no more than 2U height.

Repeaters must have access management functions to control the terminal's ID which can access to the network.

Repeaters should support IP connection between each other to enlarge the coverage.

4.3.2 **Roaming**

Terminals support roaming between different repeaters.

4.3.3 **Telephone System Integration**

The system should support communications between radios and PSTN phone without adding more equipment.

4.3.4 **Management and maintenance**

There should be a software which can provide remote diagnostic and control function through the IP network.

The remote diagnostic and control software should provide at least below functions:

- Change current transmit channel;
- Set the TX power level between High and Low value;
- Disable and Enable a repeater remotely;
- Read configuration data from repeater and write data to the repeater;
- Reset the repeater remotely;
- Provide diagnostic data including : PSU Voltage, PA Temperature, TX FWD Power, TX REF Power, VSWR, RX PLL State, TX PLL State
- Provide data of repeater's RSSI (Received Signal Strength Indication)
- Provide alarm information including alarm name, type, status, time etc.
- Support export alarm log and operation log;
- Provide email connection to send alarm information automatically;
- Provide remote configuration ability for analogue channel, digital channel and mixed channel;

The network device should support SNMP standard to report device status information.

Repeaters in the network should support remote software upgrade.

4.3.5 Encryption

40bit, 128bits, 256 bits basic and advanced encryption in Digital Mode should be supported.

Advanced encryption adopts ARC4 algorism for 40bits, or AES algorism for 128 bits, 256 bits.

4.4 Dispatching system requirements

The system should be able to provide the below functions:

4.4.1 General requirements

The dispatching system should support multi-screen display.

The dispatching system should support working with the external PTT such as the desktop PTT.

The dispatching system should support connecting mobile radio or repeater as dispatch station.

The dispatching system should support database backup and recovery.

4.4.2 Voice Dispatch

The dispatching system should support private call, group call and all call.

The dispatching system should record all voice calls. Users can query the call history through call time, caller ID or callee ID and retrieve recorded voice and play back.

The dispatcher should be able to link different channels together for temporary intercommunications purposes.

4.4.3 GPS tracking management

The dispatching system should track the radios' location based on a time interval or distance moved.

The dispatching system should support location history checking. Users are allowed to query location history information of a radio as well as playing back the route.

The dispatch system should support GPS tracking history export.

The dispatching system should support google online map, and google offline map, MapInfo map, Open street map.

User could add the Point of Interest (POI) on the map.

The dispatcher could make visible dispatching on the map.

The dispatching system should support terminal online/offline status.

4.4.4 Text message

The dispatch system can send message to an individual radio or a group of radios.

The dispatch system should support sending message to offline terminals.

The dispatching system should support alert indication when receiving a message.

The dispatching system should support send timed message to radios automatically by day, week or month.

4.4.5 Supplementary services

The dispatching system should support call alert, radio disable/enable, remote monitoring of the radio.

The dispatching system should support disabling offline radios.

The dispatching system should support disabling the unregistered radio according to radio ID.

4.4.6 Alarm management

Dispatchers can define the boundary around a location on the map for a subscriber (Geo fencing). Once he/she enters or exits this region, the dispatcher will send the alert message to the user.

The dispatching system should be able to show an emergency alarm activated by a radio and show that radio subscriber on the map.

The dispatching system should show over speed alarms.

4.4.7 Statistic report

The dispatcher must support the generation of various reports regarding calls, messages, online/offline status and various alarms.

These reports can be enquired through keyword such as time period and ID, or be exported in Excel format.

4.4.8 **Dispatch privilege management**

The dispatching system should support defining administrators and dispatchers with different dispatching privileges. Selected dispatching functions and areas could be assigned to each dispatchers based on their access requirements.

4.4.9 **SIP phone interconnection**

The dispatching system should support SIP phone intercommunication.

4.4.10 **E-mail gateway**

The dispatching system should support users to send emails to radios, or from radios to emails.

4.4.11 **OTAP**

The dispatching system should support over the air programming.

5 SPECIFICATION

5.1 Portable radio specification

General		Comply
Frequency Range	136~174MHz	
Channel Capacity	1024	
Channel spacing	25/20/12.5KHz	
Zone Capacity	64（with display）	
Operating Voltage	7.4V	
Battery Life(5/5/90 Duty Cycle, High TX Power)	Digital: up to 12 Hours	
Weight	≤355g	
Size	Length≤125 mm Width≤ 55mm Thickness≤ 37mm	
Frequency Stability	≤±1.5 ppm	
LCD Display	High brightness color LCD at least 1.8''; Sunlight readable; ≥4 rows	
Antenna Impedance	50Ω	

Transmitter		Comply?
RF Power Output	High Power:5W(VHF) Low Power :1W	
FM Modulation	11K0F3E @ 12.5KHz 14K0F3E @ 20KHz 16K0F3E @ 25KHz	
4FSK Digital Modulation	12.5KHz Data Only: 7K60FXD 12.5KHz Data & Voice: 7K60FXW	
Conducted/Radiated Emission	-36dBm <1GHz -30dBm >1GHz	
Modulation Limiting	±2.5KHz @ 12.5KHz ±4.0KHz @ 20KHz ±5.0KHz @ 25KHz	
FM Hum & Noise	40dB @ 12.5KHz 43dB @ 20KHz 45dB @ 25KHz	
Adjacent Channel Power	60dB @ 12.5KHz 70dB @ 20/25KHz	
Audio Response	+1 ~ -3dB	
Audio Distortion	≤3%	

Digital Protocol	ETSI-TS102 361-1,-2,-3	

Receiver		Comply?
Sensitivity （Analog)	0.3μV(12dB SIN AD) 0.22μV(Typical)(12dB SIN AD) 0.4μV(20dB SIN AD)	
Sensitivity （Digital)	0.3μV/BER 5%	
Adjacent Selectivity TIA-603 ETSI	60dB @ 12.5KHz/70dB @ 20&25KHz 60dB @ 12.5KHz/70dB @ 20&25KHz	
Spurious Response Rejection TIA-603 ETSI	70dB @ 12.5/20/25KHz 70dB @ 12.5/20/25KHz	
Inter-modulation TIA-603 ETSI	70dB @ 12.5/20/25KHz 65dB @ 12.5/20/25KHz	
S/N	40dB @ 12.5KHz 43dB @ 20KHz 45dB @ 25KHz	
Blocking TIA-603 ETSI	80dB 84dB	
Rated Audio Power Output	0.5W	
Rated Audio Distortion	≤3%	
Audio Response	+1 ~ -3dB	
Conducted Spurious Emission	<-57dBm	

Environmental		Comply?
Operating Temperature	-30℃ ~ +60℃	
Storage Temperature	-40℃ ~ +85℃	
ESD	IEC 61000-4-2(level 4) ±8kV(contact) ±15kV(air)	
Dustproof & Waterproof	IP67 Standard	
Humidity	Per MIL-STD-810 C/D/E/F/G Standard	
Shock & Vibration	Per MIL-STD-810 C/D/E/F/G Standard	

5.2 Mobile radio specification

General		Comply?
Frequency Range	136~174MHz	
Channel Capacity	1024（64 Zone, each with a maximum of 16 channels）	
Channel spacing	Analog:25/20/12.5kHz Digital:12.5kHz	
Zone Capacity	64	
Operating Voltage	13.6 V ±15%	
Current Drain: Standby	< 0.6A	
Current Drain: Receive	<2.0 A	
Current Drain: Transmit	<12A (45/50W); <8A(25W); <5A (5W)	
Weight	≤1.7Kg	
Size	Length≤200 mm Width≤174 mm Thickness≤60 mm	
Frequency Stability	≤±1.5 ppm	
Front case	PC+ABS	
LCD Display	High brightness TFT color LCD at least 2.0"（220 176 pixels, 262000 colors）; sunlight readable; ≥4 rows	
Antenna Impedance	50Ω	

Transmitter		Comply?
RF Power Output	Power: 25W	
FM Modulation	11K0F3E @ 12.5KHz 14K0F3E @ 20KHz 16K0F3E @ 25KHz	
4FSK Digital Modulation	12.5KHz Data Only: 7K60FXD 12.5kHz Data & Voice: 7K60FXW	
Conducted/Radiated Emission	-36dBm<1GHz -30dBm>1GHz	

Modulation Limiting	±2.5KHz @ 12.5KHz ±4.0KHz @ 20KHz ±5.0KHz @ 25KHz	
FM Hum & Noise	40dB @ 12.5KHz 43dB @ 20KHz 45dB @ 25KHz	
Adjacent Channel Power	60dB @ 12.5KHz 70dB @ 20/25KHz	
Audio Response	+1 ~ -3dB	
Audio Distortion	≤3%	
Digital Protocol	ETSI-TS102 361-1,-2,-3	

Receiver		Comply?
Sensitivity（Analog)	0.3μV(12dB SIN AD) 0.22μV(Typical)(12dB SIN AD) 0.4μV(20dB SIN AD)	
Sensitivity（Digital)	0.3μV/BER 5%	
Adjacent Selectivity TIA-603 ETSI	65dB @ 12.5KHz /75dB @ 20&25KHz 60dB@12.5KHz/70dB@25KHz&20KHz	
Spurious Response Rejection TIA-603 ETSI	75dB @ 12.5/20/25KHz 70dB @ 12.5/20/25KHz	
Inter-modulation TIA-603 ETSI	75dB @ 12.5/20/25KHz 70dB @ 12.5/20/25KHz	
S/N	40dB @ 12.5KHz 43dB @ 20KHz 45dB @ 25KHz	
Blocking TIA-603 ETSI	90dB 84dB	
Max Audio Power Output	Internal 8W(@20 ohm load) External 20W(@8 ohm load)	
Rated Audio Power Output	Internal 3W(@20 ohm load) External 7.5W(@8 ohm load)	
Rated Audio Distortion	≤3%	
Audio Response	+1 ~ -3dB	
Conducted Spurious Emission	<-57dBm	

Environmental		Comply?
Operating Temperature	-30℃ ~ +60℃	
Storage Temperature	-40℃ ~ +85℃	
ESD	IEC 61000-4-2 (level 4) ±8kV (contact) ±15kV (air)	
American Military Standard	MIL-STD-810 C/D/E/F/G	
Dustproof & Waterproof	IP54 Standard	
Humidity	Per MIL-STD-810 C/D/E/F/G Standard	
Shock & Vibration	Per MIL-STD-810 C/D/E/F/G Standard	

5.3 Repeater specification

General		Comply?
Frequency Range	400~470MHz 450~520MHz 350~400MHz 136~174MHz	
Channel Capacity	16	
Channel spacing	12.5kHz/20kHz/25kHz	
Operating Voltage	13.6 V ±15%	
Current Drain: Standby	< 1A	
Current Drain: Transmit	<11A	
Weight	≤8.5 kg	
Size	Width≤500mm,depth≤400, height≤100mm;	
Power supplier	External Power Supplies	
Frequency Stability	≤±0.5 ppm	
LCD Display	≥2.0 inch; ≥4 rows	
Available Installation Type	Rack mount, Desktop， Wall mount,	
Duty Cycle	100%	
Antenna Impedance	50Ω	

Transmitter		Comply?
RF Power Output	5~50W	
FM Modulation	11K0F3E@12.5kHz 14K0F3E@20kHz 16K0F3E@25kHz	
4FSK Digital Modulation	12.5kHz Data Only: 7K60FXD 12.5kHz Data & Voice: 7K60FXW	
Conducted/Radiated Emission	-36dBm <1GHz-30dBm >1GHz	

Modulation Limiting	±2.5 kHz @ 12.5 kHz ±4.0 kHz @ 20 kHz ±5.0 kHz @ 25 kHz	
FM Hum & Noise	-40dB @ 12.5 kHz-43dB @ 20 kHz-45dB @ 25 kHz	
Adjacent Channel Power	60dB@12.5kHz 70dB@20 /25kHz	
Audio Response	+1 ~ -3dB	
Audio Distortion	≤3%	
Digital Protocol	ETSI-TS102 361-1,-2,-3	

Receiver		**Comply?**
Sensitivity（Analog)	0.3μV(12dB SIN AD) 0.22μV(Typical)(12dB SIN AD) 0.4μV(20dB SIN AD)	
Sensitivity（Digital)	0.3μV/BER 5%	
Rated Audio Power Output	0.5W	
Adjacent Selectivity TIA-603 ETSI	65dB @ 12.5 kHz； 75dB @ 20/25 kHz 65dB @ 12.5 kHz； 75dB @ 20/25 kHz	
Spurious Response Rejection TIA-603 ETSI	80dB @ 12.5/20/25KHz 80dB @ 12.5/20/25KHz	
Inter-modulation TIA-603 ETSI	75dB @ 12.5/20/25KHz 70dB @ 12.5/20/25KHz	
S/N	-40dB@12.5kHz-43dB@20kHz-45dB@25kHz	
Rated Audio Distortion	≤3%	
Audio Response	+1 ~ -3dB	
Conducted Spurious Emission	<-57dBm	

Environmental		**Comply?**
Operating Temperature	-30℃～+60℃	
Storage Temperature	-40℃～+85℃	

6 TRANSMISSION NETWORK

The connections between repeaters, network management PC, and dispatching system shall all be via an IP network.

The proposed equipment must be able to work over IPv4 Ethernet connections.

7 QUANTITIES

Please quote.

Category	Quantity	Price including VAT
Repeater: complete with all required installation accessories	1	
Base radio: complete with installation accessories	1	
Mobile radio: complete with required installation accessories	1	
Portable radio complete	11	

Approved

Paul Mpele
Municipal Manager