



BluLemon



MZUMBE FM

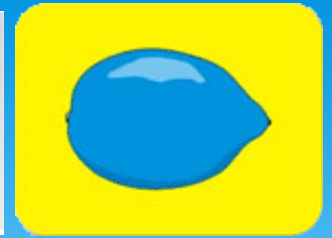
**Preparation for an application for
Community Radio Spectrum license**

20 February 2020



- * 1. Background
- * 2. Given frequency
- * 3. Interference study
- * 4. Map coverage plots and graphs
- * 5. Proposed equipment to use
- * 6. Form P of schedule 1 of application
- * 7. Summary
- * 8. Blulemon Company Transmission Profile

MZUMBE FM Background



PROPAGATION STUDIES FOR COMMUNITY SPECTRUM LICENSE IN HEIDELBERG

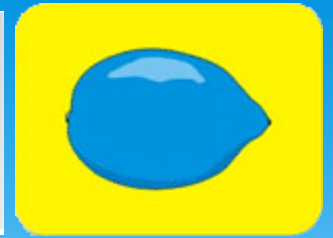
Our client, MZUMBE FM wishes to apply for a **Community Radio** Broadcasters License, broadcasting on 250 W ERP, **Frequency 97.8 MHz**, as published in the ICASA invitation document.

High Site suggested to Client

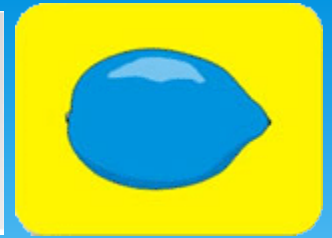
Site to be evaluated, is the transmission site north of Heidelberg, a Sentech site to mount a Dipole antenna on mast:

Transmission site, coordinates 26° 29' 19.58" S; 28° 20' 49.95" E;

MZUMBE FM Background



MZUMBE FM Background



HEIDELBERG

Write a description for your map.

Legend



Google Earth

© 2020 Google
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Image © 2020 Maxar Technologies

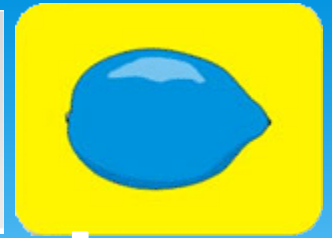
© 2020 Google
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Image © 2020 Maxar Technologies

Google Earth

100 m

MZUMBE FM

Given an Unused frequency by ICASA

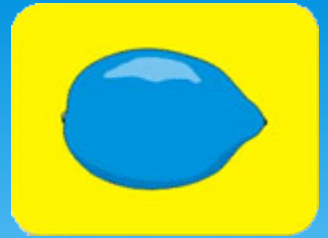


From the table below is the frequency list publish as to be a spare frequency to be used in Heidelberg **97.8 MHz** is only 200KHz apart from the powerful transmission From Sentech for 5FM at **98MHz** and transmitting 76Kw from JHB. On the receiving end in Heidelberg , 85udBv of power is measured. **We are of the opinion that this will not work as for the interference factor of 5FM from Sentech tower on 98MHz, and the next few pages will proof the reasons its not recommended.**

EC	HANKEY	87.9	0.01	V
EC	HANKEY	98.5	0.2	V
GP	HEIDELBERG	97.8	0.25	V
GP	HEIDELBERG	103	0.05	V
GP	HEIDELBERG 1	89.8	0.025	V
WC	HEXRIVIER	89.9	0.2	V
NW	ITSOSENG	101.0	0.1	V

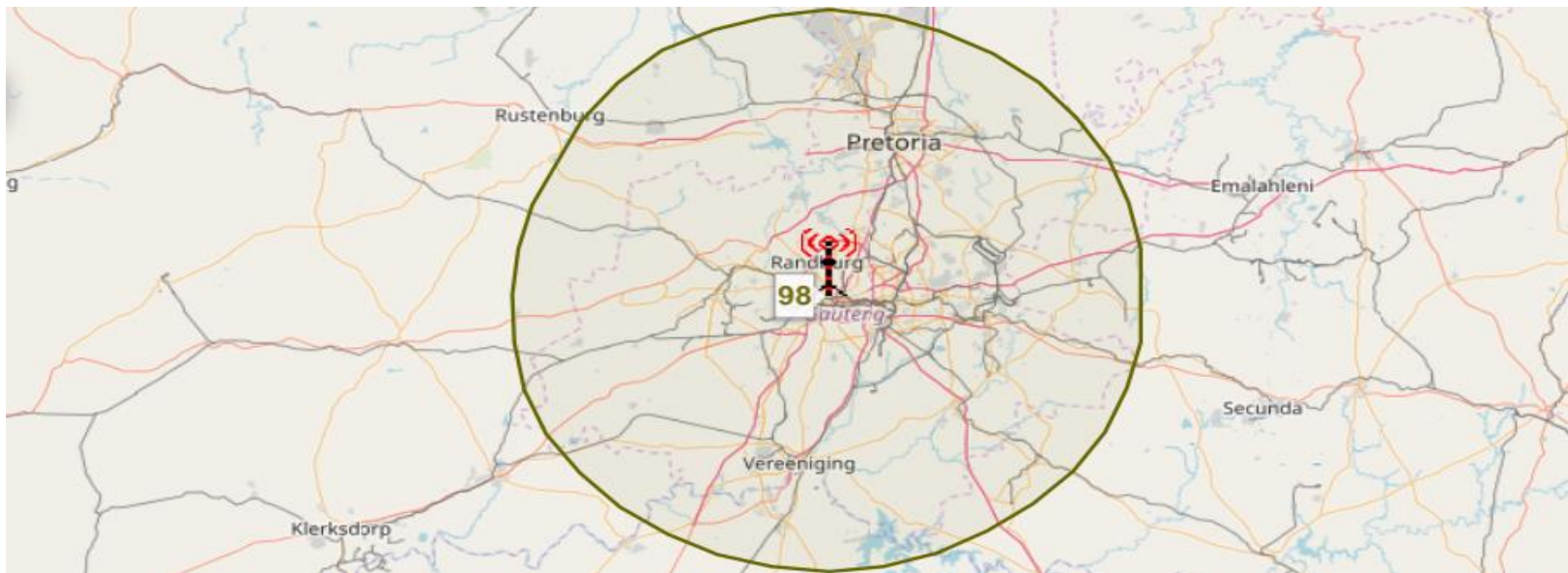
MZUMBE FM

Interference Study



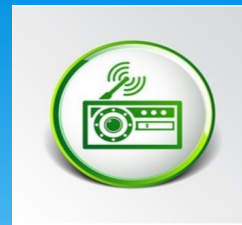
98.0 5 FM

Transmission site in Sentech JHB is 60km from Heidelberg and has a power output of 76kW. It will definitely interfere with MZUMBE FM because the difference in frequency is only 200KHz, the minimum channel separation is 400 KHz tolerance. See transmission map of 5FM on 98MHz FM below. Receive power from 5FM measured at Heidelberg is 62uDBv.



MZUMBE FM

Given an Unused frequency

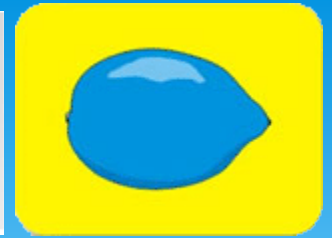


FMSCAN.ORG DATABASE

97.3	v	s	AFS			Radio 2000	Heidelberg (GT)	1km	349°	-	0.1	88dB	①	▶
98	m	s	AFS	FIVE FM	A304	SABC 5 FM	Johannesburg/Sentech Tower (GT)	48km	315°	-	76	40dB	①	▶
99.2	m	s	AFS	YFM 99.2		YFM	Johannesburg/Sentech Tower (GT)	48km	315°	-	35	37dB	①	▶
100.8	v	s	AFS			SABC Radio Sonder Grense	Heidelberg (GT)	1km	349°	-	0.1	88dB	①	▶

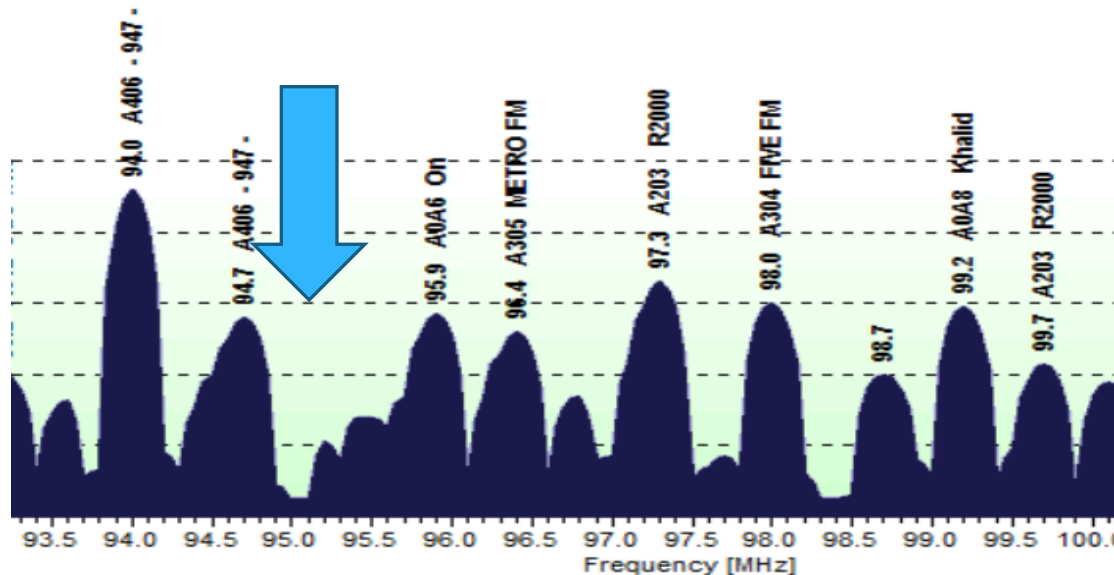
MZUMBE FM 95.1 MHz

Given an Unused frequency



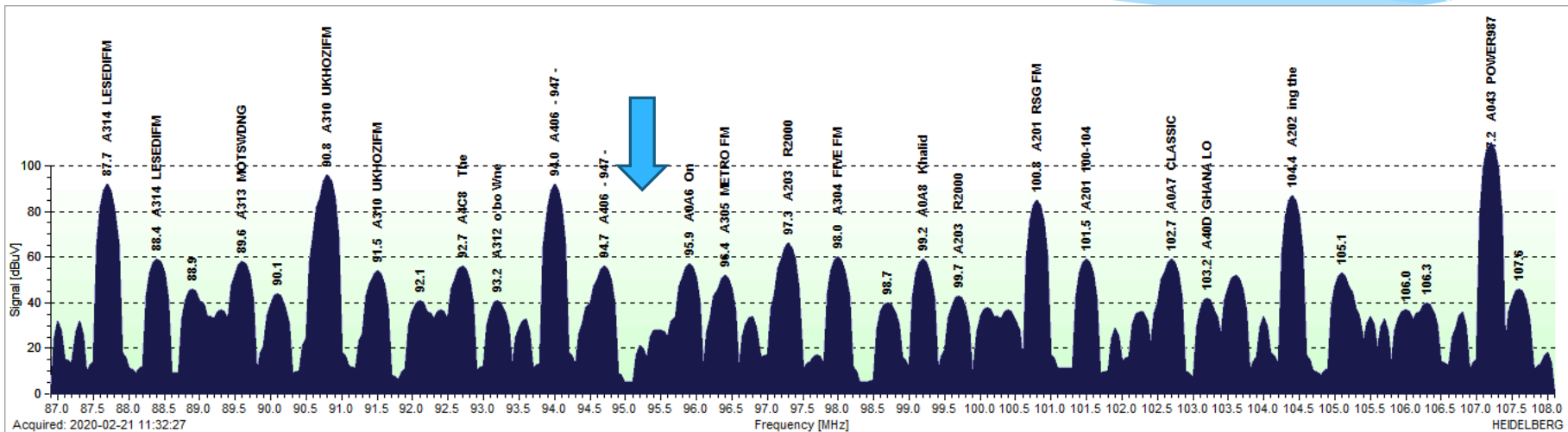
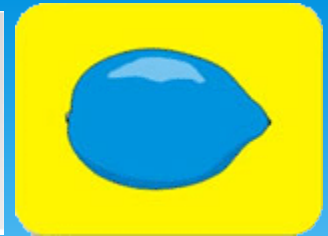
We would like to make a recommendation to the board to use a frequency of 95.1MHz.

In our study below we will provide the proof that this frequency is usable and will not Interfere with frequencies separated by 400KHz..



MZUMBE FM 95.1 MHz

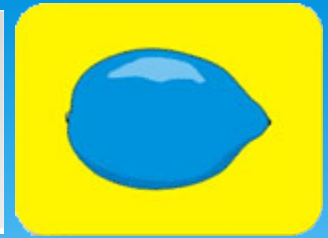
Given an Unused frequency



The graph above was taken at the point of receive at Heidelberg transmission site and a full RF scan was performed showing the results. There is one place in the spectrum that could be usable but measuring at each 50KHz intervals, the best solution proofed to be between 94.7 FM and 95.9 FM. As the graph shows the signals between those markers are less than db8uV. **Chosen frequency is 95.1MHz.**

MZUMBE FM 95.1 MHz

Given an
Unused frequency

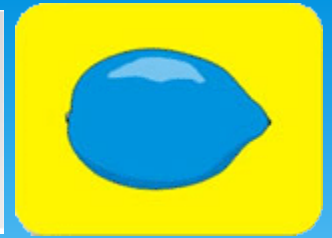


FMSCAN.ORG DATABASE

94.2	v	s	AFS	JACARAND	Jacaranda FM	Pretoria/Gelukskroon (GT)	54km	338°	-	33	52dB	①	▶
94.7	m	s	AFS	- 947 -	A406 947	Johannesburg/Sentech Tower (GT)	19km	250°	-	38	72dB	①	▶
95.4	v	s	AFS		95.4 UJ FM	Johannesburg/Carlton Centre (GT)	16km	241°	-	1	54dB	①	▶
95.6	v	s	AFS		MLFM-Munghana Lonene FM	Pretoria/Gelukskroon (GT)	54km	338°	-	11	48dB	①	▶

MZUMBE FM 95.1 MHz

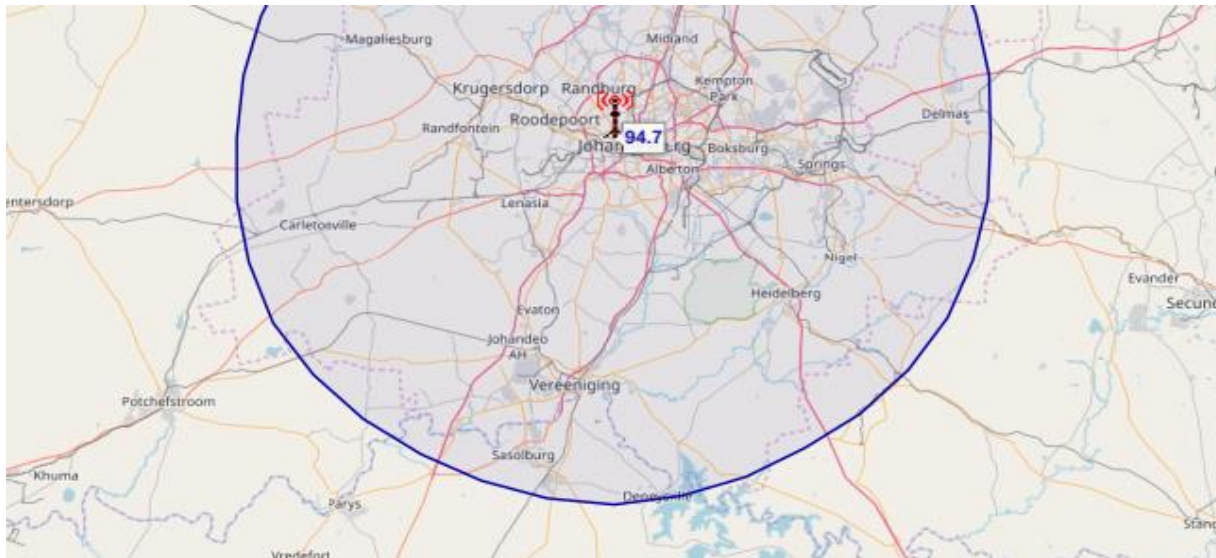
Interference Study



94.7 FM

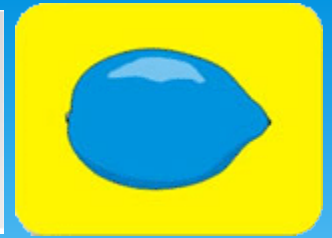
Transmission site in Sentech JHB is 60km from Heidelberg and has a power output of 76kW. It has no interference with MZUMBE FM because of the difference in frequency is 400KHz, the minimum of 400 KHz tolerance. MZUMBE FM has power output of 250W and will not interfere with 947, also because of the difference of 400KHz as the minimum allowed between frequencies.

See transmission map of 94.7 FM below. Receive power measured at Heidelberg is 85uDBv.



MZUMBE FM 95.1 MHz

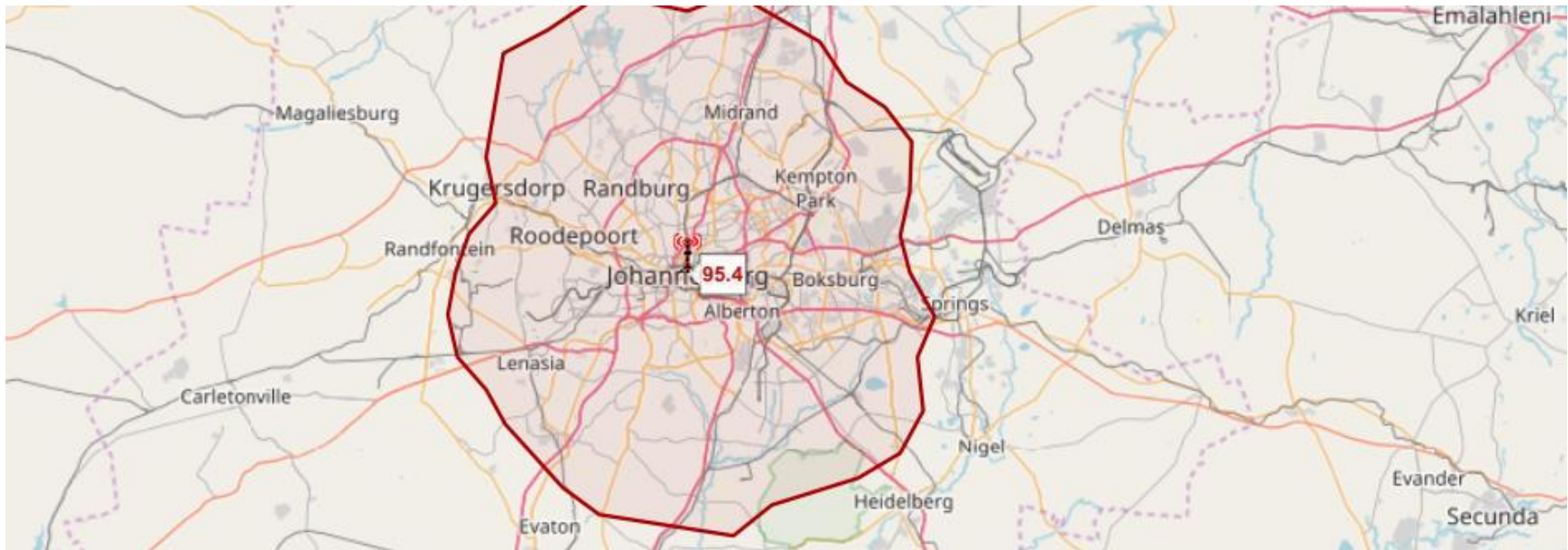
Interference Study



UJ FM 95.4 FM

Transmission site at CARLTON CENTRE JHB is 60km from Heidelberg and has a power output of 100W. It has no interference with MZUMBE FM as the map shows. MZUMBE FM has power output of 250W and will not interfere with UJ FM, although only 300KHz difference but the low power output results in no interference.

See transmission map of UJ FM below.



MZUMBE FM 95.1 MHz

Interference Study



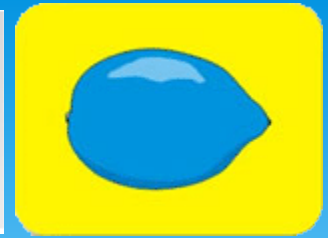
MLFM SABC PTA 95.6 FM (GELUKSKROON)

Transmission site in PRETORIA is 100km from Heidelberg and has a power output of 11KW. It has no interference with MZUMBE FM as the map shows. MZUMBE FM has power output of 250W and will not interfere with MLFM, although only 500KHz difference and the lower power output results in no interference.

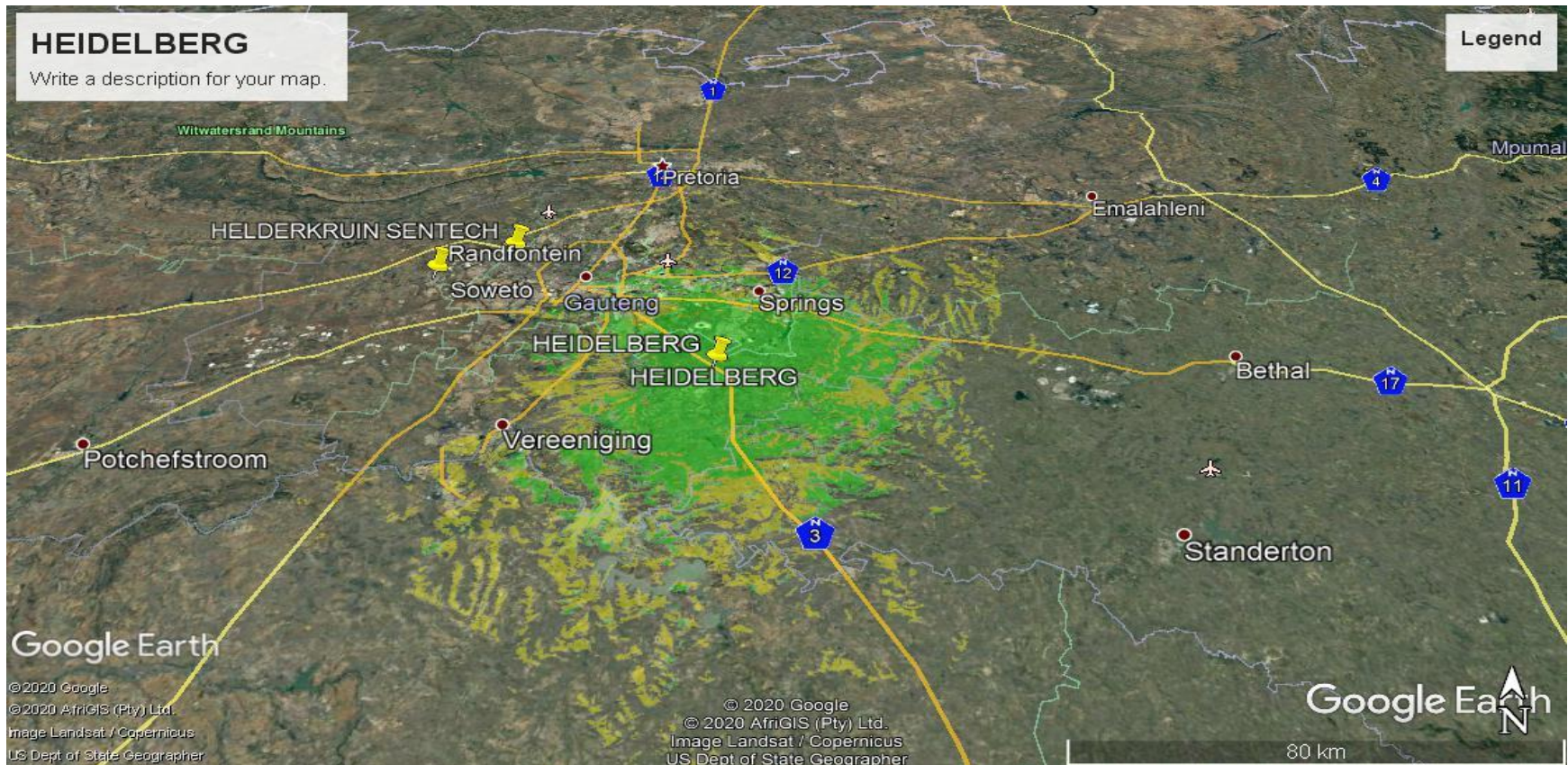


MZUMBE FM Map coverage

95.1 MHz Plots and Graphs

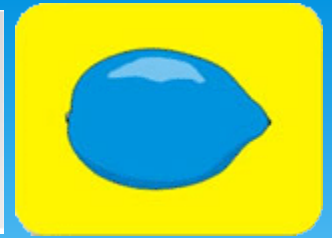


COVERAGE AREA FOR MZUMBE FM



MZUMBE FM
95.1 MHz

Proposed Transmission Equipment



EX-250LD 250W FM Transmitter

MZUMBE FM

95.1 MHz

Proposed Transmission Equipment



PARAMETER

RF SPECIFICATION

Frequency range	87.5 to 108 MHz
Modulation type	F3E and F8E (direct carrier)
Frequency synthesizer	PLL with Local/Remote control
Frequency increments	100 kHz
Frequency stability	2ppm
RF output power	> 250W
RF spurious/harmonics	< -75dBc / -70dBc
Asynchronous AM	< -60dB
Synchronous AM	< -50dB
RF output connector	N (female) 50 Ohm,
RF monitor connector	BNC (female) 50 ohm
Max VSWR	2:1 (Internally adjustable)

POWER SUPPLY

AC power input	90V to 264V @ 47-63Hz
EMPG Rating	456W @ 93 % efficiency
Power Factor	>0.98
Consumption	355VA Nominal

ENVIRONMENTAL

Operating temperature	-10 to +45 °C
Operating altitude	<3000 metres
Humidity	<90% (non condensing)

PHYSICAL

Dimensions (mm)	485W x 515D x 82H (2U)
Weight	7.5kg

TELEMETRY

Alarms (voltage free)	Forward, Reflected, Temp, PSU
Command inputs	Mono/Stereo, RF enable
IP SNMP (RJ45)	RF Forward, RF Reflected, Temp, PA Current, Deviation + Alarms

PARAMETER

COMPOSITE SPECIFICATION

WB amplitude response	+/- 0.15dB (30Hz to 100kHz)
WB stereo separation	>60dB (30Hz to 15kHz)
WB stereo crosstalk	>50dB (30Hz to 15kHz)
Total harmonic distortion	<0.1% (30Hz to 15kHz)
FM S/N ratio (stereo)	>75dB (30Hz to 15kHz)
I/P Impedance	10k ohm unbalanced
Deviation sensitivity	3.5V p-p (adjustable)
Low pass Filter	>200Hz @ -12dB/Octave

STEREO OPERATION (with 60uS de-emphasis)

AF amplitude response	+/-0.15dB (30Hz to 15kHz)
Stereo separation	>60dB (30Hz to 15kHz)
Mono/Stereo crosstalk	>50dB (30Hz to 15kHz)
Stereo distortion	<0.1% (30Hz to 15kHz)
Stereo S/N ratio	>75dB (30Hz to 20kHz)
Input Impedance	600 ohm balanced (XLR)
Deviation sensitivity	+6dBm for +/-40kHz deviation
Pre-emphasis	50 or 75uS (Internal link)
38kHz suppression	>55dB

STEREO LIMITER (Option 1)

Audio limiter sensitivity	10dBm nom. for 68kHz deviation
Attack time	< 2ms for Increased 10dB MP step
Decay time	>80ms for decreased 10dB MP step
Limiter distortion	< 0.25% (10dB into limiting)
Limiter threshold	Internally adjustable

RDS ENCODER

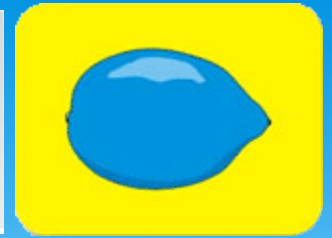
Factory Programmed	PI, PS, AF only
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STANDARDS

Complies with CCIR Recommendation BG.450-1 (1), 412-5 (3), 468-4 ETS 300, 384. FCC Certified for the USA market.

MZUMBE FM
95.1 MHz

Schedule 1
FORM P ICASA App



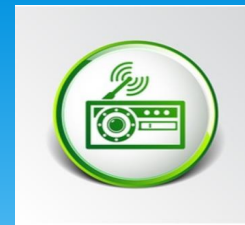
Independent Communications Authority of South Africa
Pinmill Farm, 164 Katherine Street, Sandton
Private Bag X10002, Sandton, 2146

BROADCASTING SPECTRUM LICENCE
APPLICATION FORM

Applicant/Radio Station Name	MZUMBE FM
Telephone	0834238625
Email	nkopane@leka.co.za
Service Licence No:	NEW APPLICATION

MZUMBE FM
95.1 MHz

Schedule 1
FORM P ICASA App

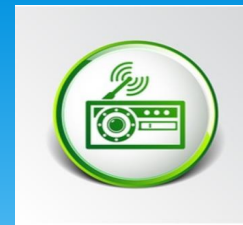


TRANSMITTER SITE*	HEIDELBERG	
SIGNAL DISTRIBUTOR*	BLULEMON PTY LTD	
FREQUENCY APPLIED FOR*	95.1 FM	MHz
GEOGRAPHIC CO-ORDINATES*	26 29 19.58S	28 20 49.95E
PHYSICAL ADDRESS	HEIDELBERG NORTH MOUNTAIN	
SITE HEIGHT*	1681	m above sea level
MID-ANTENNA HEIGHT*	15	m above site
MAXIMUM EFFECTIVE ANTENNA HEIGHT*	15-133	m above terrain

MZUMBE FM
95.1 MHz

Schedule 1

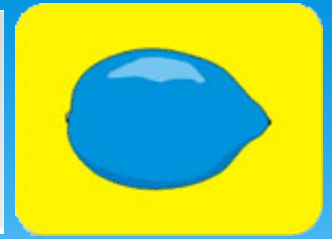
FORM P ICASA App



DESIGNATION OF EMISSION*	250KF8EHF	
FREQUENCY STABILITY*	2	kHz
SPURIOUS EMISSION LEVEL*	60	dB/1mW
MAXIMUM DEVIATION*	75	kHz
MAXIMUM EFFECTIVE RADIATED POWER (ERP)*	0.250	kW
ANTENNA HORIZONTAL RADIATED PATTERN*	VERTICAL	
ANTENNA POLARISATION*	OMI DIRECTIONAL	
PROGRAMME SOURCE*	STL	
RDS SERVICE	NONE	
SST SERVICE	NONE	
PERIOD**	5 YEARS	

MZUMBE FM

95.1 MHz



REPORT Summary

SUMMARY ON INTERFERENCE STUDY:

MZUMBE FM has an output power ERP of 250 W with an AGL (average ground level) of 30m and therefore will not interfere with any other station mentioned in this exercise as it is within the 400kHz bandwidth prescribed as safe for interference.

94.7 FM, although it is 400KHz apart from 95.1MHz, and output power of 38Kw ERP and only 60 km from Heidelberg is in question. Taking in consideration the output ERP of 250 W and 80dBv will only have an impact when MZUMBE FM signal is below 30dBv to cause interference. The same applied for UJFM 95.4 from Carlton In Johannesburg. Applying the ITU-R BS.641 method where 400 KHz deviation and the attenuation of -19db in signal strength.

No interference with any other stations and MZUMBE FM.

MZUMBE FM

95.1 MHz



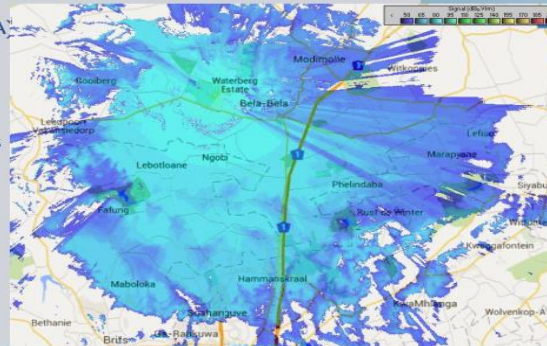
Blulemon Company Transmission Profile

Consulting and System Integration: Your One-Stop Solution Provider for Broadcast Technology



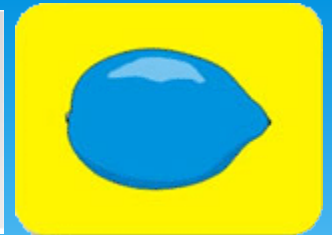
- With over 60 years of accumulated experience in Broadcast, Communication and Information Technology, BluLemon offers turnkey solutions that will achieve your end objectives. Our target is to make you a successful broadcaster within your time and budget frames.
- **Agent for international broadcast equipment suppliers**
- **Turnkey project implementation including**
 - Design and construction of radio and TV studios and transmitter stations
 - Fixed and portable satellite, microwave and broadband links
 - Supply of studio and transmitter equipment
 - OB, studio and post production facilities
 - State-of-the-art solutions: Benefit from latest trends
 - Digital radio installation: DRM(+)/DAB+/DVB-T2 (lite)
 - Digital television headend and transmission: DVB-T2
 - Solar and wind powered remote transmitter stations
- **Consultants to the broadcast industry**
 - Assistance with licensing and regulatory affairs (ICASA)
 - Geographical, propagation and interference analysis
 - Budget analysis and task management
 - Transmitter coverage and spectrum planning
- **After sales services and maintenance**

BluLemon have entered into service level agreements for maintaining the transmitters and studios for a number of Radio and TV stations
- **Incubation and Training**



MZUMBE FM

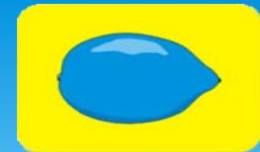
95.1 MHz



Blulemon Company

Transmission Profile

Signal Distribution:



- BluLemon is a licensed Signal Distributor by ICASA. Besides Sentech and Orbicom, BluLemon is the only ECNS license holder who has already operated digital television transmitters in South Africa using the DVB-T2 standard and the first signal distributor to broadcast DRM+ radio in Africa.
- Particularly if you require covering an individual geographic area, multiplex sharing brings challenges. But we can offer you a tailored signal distribution solution for your specific needs.
 - Identification of the best technology for digital TV, radio and broadband applications
 - We provide transmission facilities that meet your financial requirements
 - Combination of different digital technologies or standards to optimize your business efficiency (multi-standard approach)
 - All technologies are available in our portfolio: DRM30, DRM+, DAB+/DMB, DVB-T2, DVB-T2 lite, AM-AMSS, FM-RDS, IP-Broadband (IPTV/OTT)
 - Full turnkey solutions including hosting of VoD, services and transmission of Push-VoD content, Shoutcast/Icecast hosting
 - Programming of FM-RDS static and dynamic services and linking to your studio



MZUMBE FM

95.1 MHz



Blulemon Company

Transmission Profile

Signal Distribution Services analysis:

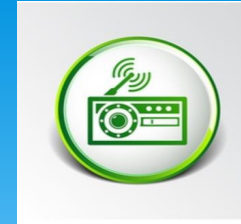


- **Various services offered by Blulemon Pty Ltd:**
- Assistance with licensing and regulatory affairs (ICASA). We will assist with your spectrum license application and supply all answers to the questionnaire as per the regulations required by ICASA.
- Transmitter coverage and spectrum planning. Geographical, propagation and interference analysis. Antenna designs for optimal reach and pin point coverage. Cost for full report and maps of complete study at per ICASA recommendations and acceptability.
- Entering into contractual agreements to provide signal distribution license monthly. Assist with amendment of spectrum license change of signal distributor.
- Transmitter rental agreements: (typical)
 - 500W FM transmitter with Stereo encoder built in
 - 250W FM transmitter with Stereo encoder built in
 - 100W FM transmitter
- Service level agreements and maintenance support and emergency call out monthly costs agreements.



MZUMBE FM

95.1 FM



Blulemon Company

Transmission Profile

Blulemon ECNS Licences:

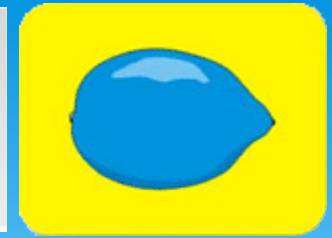


- Blulemon holds 4 x ECNS licenses in the following districts:
- Johannesburg Metropolitan district
- Ekurhuleni district
- Cape Town Metropolitan district
- West Coast district Western Cape

ICASA Independent Communications Authority of South Africa Pretorius, 100 Victoria Road, Sandton Private Bag 11000, Sandton, 2146	ICASA Independent Communications Authority of South Africa Pretorius, 100 Victoria Road, Sandton Private Bag 11000, Sandton, 2146	ICASA Independent Communications Authority of South Africa Pretorius, 100 Victoria Road, Sandton Private Bag 11000, Sandton, 2146	ICASA Independent Communications Authority of South Africa Pretorius, 100 Victoria Road, Sandton Private Bag 11000, Sandton, 2146
CLASS ELECTRONIC COMMUNICATIONS NETWORK SERVICE LICENCE No: 9854/CECNS/JUN2017 GRANTED AND ISSUED TO BLULEMON FILM PRODUCTION (PTY) LTD REGISTRATION NO: 236501151207 FOR THE PROVISION OF ELECTRONIC COMMUNICATIONS NETWORK SERVICES	CLASS ELECTRONIC COMMUNICATIONS NETWORK SERVICE LICENCE No: 9327/CECNS/OCT2012 GRANTED AND ISSUED TO BLULEMON (PTY) LTD REGISTRATION NUMBER: 205501151207 FOR THE PROVISION OF ELECTRONIC COMMUNICATIONS NETWORK SERVICES	CLASS ELECTRONIC COMMUNICATIONS NETWORK SERVICE LICENCE No: 1335/CECNS/MAY2019 GRANTED AND ISSUED TO BLULEMON FILM PRODUCTION (PTY) LTD REGISTRATION NUMBER: 205501151207 FOR THE PROVISION OF ELECTRONIC COMMUNICATIONS NETWORK SERVICES	CLASS ELECTRONIC COMMUNICATIONS NETWORK SERVICE LICENCE No: 1093/CECNS/JULY2016 GRANTED AND ISSUED TO KUDALA TELECOMS (PTY) LTD REGISTRATION NUMBER: 20173288907 FOR THE PROVISION OF ELECTRONIC COMMUNICATIONS NETWORK SERVICES
SIGNED FOR AND ON BEHALF OF THE INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA AT SANDTON ON THIS 09 th DAY OF June 2017 YERODU C. MAREFYA REGIONAL MANAGER: GAUTENG	SIGNED FOR AND ON BEHALF OF THE INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA EFFECTIVE FROM 06 NOVEMBER 2012 NKHETHLENI GIDI DIR. LICENSING DATE: 21/10/2016	SIGNED FOR AND ON BEHALF OF THE INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA AT NELSPOORT ON THIS 24 th DAY OF 10 th 2019 TRICK WALLACE ROBERTS RM. UPFURALANGA REGION	SIGNED FOR AND ON BEHALF OF THE INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA AT BLOEMFONTEIN ON THIS 14 th DAY OF July 2018 PURELLA PRADO ACTING: REGIONAL MANAGER

MZUMBE FM

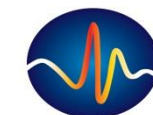
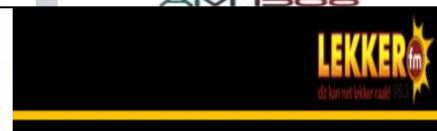
95.1 MHz



Blulemon Company

Transmission Profile

BluLemon clients:



NASRECONLINE
radio