

SYSTEM: Riverside County CA
 ROUTE: Motorola Radio Replacement
 FILE: Y:\CUSTOMER\FEASIBLE\RIVERCO.CA\MOTOREPL.CA\RECORD-1
 REF: RAIN CURVE 67 - SAN DIEGO CALIFORNIA USA

Alcatel-Lucent TROYER	Feasibility	Midland NAD83 33 50 26.0 N 114 57 19.9 W	Palen McCoy NAD83 33 55 16.8 N 115 01 26.0 W
GROUND ELEVATION	Feet	844.6	1318.9
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dB	38.1	38.1
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	55.0	142.0
MAIN FEEDER LENGTH	Feet	85.0	172.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	2.4	4.8
PROTECT CHANNEL LOSS	dB	12.9	12.9
OTHER FEEDER LOSSES	dB	.6	.6
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	3.1	3.1
OTHER RECEIVE LOSSES	dB	3.4	3.4
CALCULATED EIRP	dBm	62.0	59.6
MAXIMUM EIRP (PART 101)	dBm	70.0	70.0
RADIO TYPE and FCC ID		95MPR10-L128F5-25	
FREQUENCY BAND	MHz	10600	
PATH LENGTH	Miles	6.8	
MEAN ANNUAL TEMPERATURE	Deg F	68.7	
ABSOLUTE HUMIDITY	g/m ³	12.5	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	133.8	
ABSORPTION LOSS	dB	.2	
FIELD MARGIN	dB	1.0	
DISPERSIVE FADE MARGIN	dB	60.0	
TRANSMIT POWER	dBm	30.0	HOT-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-22.0	
RECEIVER THRESHOLD	dBm	-80.5	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-43.7	-43.7
THERMAL FADE MARGIN	dB	36.8	36.8
MINIMUM FADE MARGIN	dB	24.0	24.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	36.8	36.8

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Alcatel-Lucent	Feasibility	Wileys Well	Spring Hill
TROYER		NAD83 33 36 18.9 N 114 54 09.5 W	NAD83 33 29 45.0 N 115 16 30.5 W
SPACE DIV IMPROVE FACTOR	THERMAL	200.0	200.0
MULTIPATH OUTAGE SECONDS	THERMAL	.1	.1
SPACE DIV IMPROVE FACTOR	DIGITAL	200.0	200.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH	2-WAY		.2
UPFADE OUTAGE	2-WAY		6.9
PATH AVAILABILITY	2-WAY	percent	99.9999772 7.2 sec
OUTAGE OBJECTIVE	YEAR	percent	99.9999000 31.5 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

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Alcatel-Lucent	Feasibility	Wileys Well	Spring Hill
TROYER		NAD83 33 36 18.9 N 114 54 09.5 W	NAD83 33 29 45.0 N 115 16 30.5 W
GROUND ELEVATION	Feet	392.7	2762.7
MAIN ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
MAIN ANTENNA GAIN	dBi	39.5	39.5
MAIN RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
DIVERSITY ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
DIVERSITY ANTENNA GAIN	dBi	39.5	39.5
DIVERSITY RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
MAIN CENTERLINE	Feet	50.0	50.0
MAIN FEEDER LENGTH	Feet	80.0	80.0
MAIN FEED LOSS IN dB/100	Feet	1.3 E65	1.3 E65
MAIN FEEDER LOSS	dB	1.0	1.0
DIVERSITY CENTERLINE	Feet	20.0	20.0
DIVERSITY FEEDER LENGTH	Feet	50.0	50.0
OTHER FEEDER LOSSES	dB	.6	.6
OTHER TRANSMIT LOSSES	dB	1.3	1.3
OTHER RECEIVE LOSSES	dB	1.6	1.6
CALCULATED EIRP	dBm	68.6	68.6
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR67-L128F5-25	
FREQUENCY BAND	MHz		6700
PATH LENGTH	Miles		22.8
MEAN ANNUAL TEMPERATURE	Deg F		69.6
ABSOLUTE HUMIDITY	g/m^3		13.0
CLIMATE FACTOR			1.0
ROUGHNESS FACTOR	Feet		140.0
FREE SPACE LOSS	dB		140.3
ABSORPTION LOSS	dB		.4
FIELD MARGIN	dB		1.0
DISPERSIVE FADE MARGIN	dB		60.0
TRANSMIT POWER	dBm		32.5
ATPC POWER REDUCTION	dB		0.0
MAXIMUM RECEIVED SIGNAL	dBm		-22.0
RECEIVER THRESHOLD	dBm		-81.0
			BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-37.4	-37.4
DIV RECEIVED SIGNAL	dBm	-37.0	-37.0
THERMAL FADE MARGIN	dB	43.6	43.6
SPACE DIV THERMAL FM	dB	44.0	44.0
MINIMUM FADE MARGIN	dB	33.0	33.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	44.0	44.0

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 REF: RAIN CURVE 57 - PRESCOTT ARIZONA USA

Alcatel-Lucent		Feasibility	Black Jack		Midland	
TROYER			NAD83 33 49 34.7 N		NAD83 33 50 26.0 N	
			114 51 39.6 W		114 57 19.9 W	
SPACE DIV IMPROVE FACTOR	THERMAL		1.0		1.0	
MULTIPATH OUTAGE SECONDS	THERMAL		4.7		4.7	
SPACE DIV IMPROVE FACTOR	DIGITAL		1.0		1.0	
MULTIPATH OUTAGE SECONDS	DIGITAL		.1		.1	
TOTAL MULTIPATH	2-WAY	seconds			9.4	
UPFADE OUTAGE	2-WAY	seconds			0.0	
CRANE RAIN OUTAGE	2-WAY	seconds			3.2	
PATH AVAILABILITY	2-WAY	percent	99.9999599		12.6 sec	
OUTAGE OBJECTIVE	YEAR	percent	99.9999000		31.5 sec	

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 REF: RAIN CURVE 57 - PRESCOTT ARIZONA USA

Alcatel-Lucent TROYER	Feasibility	Black Jack NAD83 33 49 34.7 N 114 51 39.6 W	Midland NAD83 33 50 26.0 N 114 57 19.9 W
GROUND ELEVATION	Feet	983.2	844.6
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.1	38.1
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	55.0	55.0
MAIN FEEDER LENGTH	Feet	85.0	85.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	2.4	2.4
PROTECT CHANNEL LOSS	dB	12.9	12.9
OTHER FEEDER LOSSES	dB	.6	.6
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	3.1	3.1
OTHER RECEIVE LOSSES	dB	3.4	3.4
CALCULATED EIRP	dBm	62.0	62.0
MAXIMUM EIRP (PART 101)	dBm	70.0	70.0
RADIO TYPE and FCC ID		95MPR10-L128F5-25	
FREQUENCY BAND	MHz	10600	
PATH LENGTH	Miles	5.5	
MEAN ANNUAL TEMPERATURE	Deg F	69.0	
ABSOLUTE HUMIDITY	g/m ³	12.9	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	43.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	132.0	
ABSORPTION LOSS	dB	.2	
FIELD MARGIN	dB	1.0	
DISPERSIVE FADE MARGIN	dB	60.0	
TRANSMIT POWER	dBm	30.0	
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-22.0	
RECEIVER THRESHOLD	dBm	-80.5	
			HOT-STANDBY
MAIN RECEIVED SIGNAL	dBm	-39.4	-39.4
THERMAL FADE MARGIN	dB	41.1	41.1
MINIMUM FADE MARGIN	dB	24.0	24.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	41.1	41.1

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Alcatel-Lucent	Feasibility	Road 177	Road 62
TROYER		NAD83 33 52 54.6 N 115 15 06.2 W	NAD83 34 02 47.5 N 115 13 16.5 W
GROUND ELEVATION	Feet	596.7	1415.7
MAIN ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
MAIN ANTENNA GAIN	dBi	39.5	39.5
MAIN RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
MAIN CENTERLINE	Feet	55.0	233.0
MAIN FEEDER LENGTH	Feet	85.0	263.0
MAIN FEED LOSS IN dB/100	Feet	1.3 E65	1.3 E65
MAIN FEEDER LOSS	dB	1.1	3.4
PROTECT CHANNEL LOSS	dB	11.7	11.7
OTHER FEEDER LOSSES	dB	.6	.6
OTHER TRANSMIT LOSSES	dB	1.9	1.9
OTHER RECEIVE LOSSES	dB	2.8	2.8
CALCULATED EIRP	dBm	67.9	65.6
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR67-L128F5-25	
FREQUENCY BAND	MHz	6700	
PATH LENGTH	Miles	11.5	
MEAN ANNUAL TEMPERATURE	Deg F	68.5	
ABSOLUTE HUMIDITY	g/m^3	12.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
FREE SPACE LOSS	dB	134.3	
ABSORPTION LOSS	dB	.2	
FIELD MARGIN	dB	1.0	
DISPERSIVE FADE MARGIN	dB	60.0	
TRANSMIT POWER	dBm	32.5	HOT-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-22.0	
RECEIVER THRESHOLD	dBm	-81.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-35.5	-35.5
THERMAL FADE MARGIN	dB	45.5	45.5
MINIMUM FADE MARGIN	dB	30.0	30.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	45.5	45.5
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	2.0	2.0
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	.1	.1
TOTAL MULTIPATH	2-WAY	seconds	4.2
UPFADE OUTAGE	2-WAY	seconds	0.0
PATH AVAILABILITY	2-WAY	percent	99.9999866 4.2 sec
OUTAGE OBJECTIVE	YEAR	percent	99.9999000 31.5 sec

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Alcatel-Lucent	Feasibility	Black Eagle	Belle Mt.
TROYER		NAD83 33 52 30.7 N 115 31 56.5 W	NAD83 34 00 07.9 N 115 59 54.5 W
SPACE DIV IMPROVE FACTOR	THERMAL	200.0	200.0
MULTIPATH OUTAGE SECONDS	THERMAL	.3	.3
SPACE DIV IMPROVE FACTOR	DIGITAL	200.0	200.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH	2-WAY		.7
UPFADE OUTAGE	2-WAY		0.0
PATH AVAILABILITY	2-WAY	percent	99.9999978 .7 sec
OUTAGE OBJECTIVE	YEAR	percent	99.9999000 31.5 sec

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Alcatel-Lucent TROYER	Feasibility	Black Eagle NAD83 33 52 30.7 N 115 31 56.5 W	Belle Mt. NAD83 34 00 07.9 N 115 59 54.5 W
GROUND ELEVATION	Feet	2647.8	4447.1
MAIN ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
MAIN ANTENNA GAIN	dBi	39.5	39.5
MAIN RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
DIVERSITY ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
DIVERSITY ANTENNA GAIN	dBi	39.5	39.5
DIVERSITY RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
MAIN CENTERLINE	Feet	55.0	55.0
MAIN FEEDER LENGTH	Feet	85.0	85.0
MAIN FEED LOSS IN dB/100	Feet	1.3 E65	1.3 E65
MAIN FEEDER LOSS	dB	1.1	1.1
DIVERSITY CENTERLINE	Feet	25.0	25.0
DIVERSITY FEEDER LENGTH	Feet	55.0	55.0
OTHER FEEDER LOSSES	dB	.6	.6
OTHER TRANSMIT LOSSES	dB	1.3	1.3
OTHER RECEIVE LOSSES	dB	1.6	1.6
CALCULATED EIRP	dBm	68.5	68.5
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR67-L128F5-25	
FREQUENCY BAND	MHz	6700	
PATH LENGTH	Miles	28.2	
MEAN ANNUAL TEMPERATURE	Deg F	69.0	
ABSOLUTE HUMIDITY	g/m^3	12.0	
CLIMATE FACTOR		1.0	
ROUGHNESS FACTOR	Feet	140.0	
FREE SPACE LOSS	dB	142.1	
ABSORPTION LOSS	dB	.5	
FIELD MARGIN	dB	1.0	
DISPERSIVE FADE MARGIN	dB	60.0	
TRANSMIT POWER	dBm	32.5	
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-22.0	
RECEIVER THRESHOLD	dBm	-81.0	
		BER= 10-6	
MAIN RECEIVED SIGNAL	dBm	-39.4	-39.4
DIV RECEIVED SIGNAL	dBm	-39.0	-39.0
THERMAL FADE MARGIN	dB	41.6	41.6
SPACE DIV THERMAL FM	dB	42.0	42.0
MINIMUM FADE MARGIN	dB	33.0	33.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	42.0	42.0

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Alcatel-Lucent	Feasibility	Indio	Mecca Land Fill
TROYER		NAD83 33 42 24.7 N 116 13 20.5 W	NAD83 33 34 19.2 N 116 00 01.2 W
SPACE DIV IMPROVE FACTOR	THERMAL	200.0	200.0
MULTIPATH OUTAGE SECONDS	THERMAL	.3	.3
SPACE DIV IMPROVE FACTOR	DIGITAL	200.0	200.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH	2-WAY	seconds	.6
UPFADE OUTAGE	2-WAY	seconds	0.0
PATH AVAILABILITY	2-WAY	percent	99.9999981 .6 sec
OUTAGE OBJECTIVE	YEAR	percent	99.9999000 31.5 sec

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Alcatel-Lucent TROYER	Feasibility	Indio NAD83 33 42 24.7 N 116 13 20.5 W	Mecca Land Fill NAD83 33 34 19.2 N 116 00 01.2 W
GROUND ELEVATION	Feet	-8.8	42.5
MAIN ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
MAIN ANTENNA GAIN	dBi	39.5	39.5
MAIN RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
DIVERSITY ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
DIVERSITY ANTENNA GAIN	dBi	39.5	39.5
DIVERSITY RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
MAIN CENTERLINE	Feet	85.0	115.0
MAIN FEEDER LENGTH	Feet	115.0	145.0
MAIN FEED LOSS IN dB/100	Feet	1.3 E65	1.3 E65
MAIN FEEDER LOSS	dB	1.5	1.9
DIVERSITY CENTERLINE	Feet	55.0	85.0
DIVERSITY FEEDER LENGTH	Feet	85.0	115.0
PROTECT CHANNEL LOSS	dB	11.7	11.7
OTHER FEEDER LOSSES	dB	.6	.6
OTHER TRANSMIT LOSSES	dB	1.9	1.9
OTHER RECEIVE LOSSES	dB	2.8	2.8
CALCULATED EIRP	dBm	67.5	67.1
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR67-L128F5-25	
FREQUENCY BAND	MHz	6700	
PATH LENGTH	Miles	15.8	
MEAN ANNUAL TEMPERATURE	Deg F	70.5	
ABSOLUTE HUMIDITY	g/m^3	12.4	
CLIMATE FACTOR		2.0	
ROUGHNESS FACTOR	Feet	49.0	
FREE SPACE LOSS	dB	137.1	
ABSORPTION LOSS	dB	.3	
FIELD MARGIN	dB	1.0	
DISPERSIVE FADE MARGIN	dB	60.0	
TRANSMIT POWER	dBm	32.5	
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-22.0	
RECEIVER THRESHOLD	dBm	-81.0	
			BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-37.2	-37.2
DIV RECEIVED SIGNAL	dBm	-36.8	-36.8
THERMAL FADE MARGIN	dB	43.8	43.8
SPACE DIV THERMAL FM	dB	44.2	44.2
MINIMUM FADE MARGIN	dB	35.0	35.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	44.2	44.2

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Alcatel-Lucent Feasibility		Toro Peak	Box Canyon
TROYER		NAD83 33 31 24.7 N 116 25 30.9 W	NAD83 33 36 49.8 N 115 54 46.5 W
SPACE DIV IMPROVE FACTOR	THERMAL	172.4	172.4
MULTIPATH OUTAGE SECONDS	THERMAL	1.1	1.1
SPACE DIV IMPROVE FACTOR	DIGITAL	200.0	200.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH	2-WAY	seconds	2.2
UPFADE OUTAGE	2-WAY	seconds	0.0
PATH AVAILABILITY	2-WAY	percent	99.999929 2.2 sec
OUTAGE OBJECTIVE	YEAR	percent	99.9999000 31.5 sec

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Alcatel-Lucent	Feasibility	Toro Peak	Box Canyon
TROYER		NAD83 33 31 24.7 N 116 25 30.9 W	NAD83 33 36 49.8 N 115 54 46.5 W
GROUND ELEVATION	Feet	8628.5	1284.6
MAIN ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
MAIN ANTENNA GAIN	dBi	39.5	39.5
MAIN RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
DIVERSITY ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
DIVERSITY ANTENNA GAIN	dBi	39.5	39.5
DIVERSITY RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
MAIN CENTERLINE	Feet	55.0	55.0
MAIN FEEDER LENGTH	Feet	85.0	85.0
MAIN FEED LOSS IN dB/100	Feet	1.3 E65	1.3 E65
MAIN FEEDER LOSS	dB	1.1	1.1
DIVERSITY CENTERLINE	Feet	25.0	25.0
DIVERSITY FEEDER LENGTH	Feet	55.0	55.0
OTHER FEEDER LOSSES	dB	.6	.6
OTHER TRANSMIT LOSSES	dB	1.3	1.3
OTHER RECEIVE LOSSES	dB	1.6	1.6
CALCULATED EIRP	dBm	68.5	68.5
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR67-L128F5-25	
FREQUENCY BAND	MHz	6700	
PATH LENGTH	Miles	30.2	
MEAN ANNUAL TEMPERATURE	Deg F	66.3	
ABSOLUTE HUMIDITY	g/m^3	12.5	
CLIMATE FACTOR		2.0	
ROUGHNESS FACTOR	Feet	140.0	
FREE SPACE LOSS	dB	142.7	
ABSORPTION LOSS	dB	.5	
FIELD MARGIN	dB	1.0	
DISPERSIVE FADE MARGIN	dB	60.0	
TRANSMIT POWER	dBm	32.5	
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-22.0	
RECEIVER THRESHOLD	dBm	-81.0	
			BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-40.1	-40.1
DIV RECEIVED SIGNAL	dBm	-39.7	-39.7
THERMAL FADE MARGIN	dB	40.9	40.9
SPACE DIV THERMAL FM	dB	41.3	41.3
MINIMUM FADE MARGIN	dB	35.0	35.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	41.3	41.3

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Nokia Feasibility		Ranger Peak		Morongo	
TROYER		NAD83 33 50 36.6 N 116 49 30.6 W		NAD83 33 55 37.3 N 116 45 13.5 W	
SPACE DIV IMPROVE FACTOR	THERMAL	1.0		1.0	
MULTIPATH OUTAGE SECONDS	THERMAL	2.7		2.7	
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0		1.0	
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0		0.0	
TOTAL MULTIPATH	2-WAY			5.5	
UPFADE OUTAGE	2-WAY			0.0	
CRANE RAIN OUTAGE	2-WAY			.1	
PATH AVAILABILITY	2-WAY		percent	99.9999823	5.6 sec
OUTAGE OBJECTIVE	YEAR		percent	99.9999000	31.5 sec

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Nokia Feasibility		Ranger Peak		Morongo	
TROYER		NAD83 33 50 36.6 N 116 49 30.6 W		NAD83 33 55 37.3 N 116 45 13.5 W	
GROUND ELEVATION	Feet	5067.9		1726.9	
MAIN ANTENNA SIZE	Feet	4.0 SU4-103B		4.0 SU4-103B	
MAIN ANTENNA GAIN	dBi	39.9		39.9	
MAIN RADOME LOSS	dB	0.0 TEFLON		0.0 TEFLON	
MAIN CENTERLINE	Feet	52.0		20.0	
MAIN FEEDER LENGTH	Feet	82.0		50.0	
MAIN FEED LOSS IN dB/100	Feet	2.8 E105		2.8 E105	
MAIN FEEDER LOSS	dB	2.3		1.4	
PROTECT CHANNEL LOSS	dB	12.9		12.9	
OTHER FEEDER LOSSES	dB	.9		.9	
WET RADOME LOSS	dB	1.0		1.0	
OTHER TRANSMIT LOSSES	dB	3.1		3.1	
OTHER RECEIVE LOSSES	dB	3.4		3.4	
CALCULATED EIRP	dBm	63.6		64.5	
MAXIMUM EIRP (PART 101)	dBm	70.0		70.0	
RADIO EQUIPMENT TYPE			95MPR10-L128F5-25		
RADIO IDENTIFIER			95MPR10-L128F5-25		
FREQUENCY BAND	MHz		10600		5M00D7W
PATH LENGTH	Miles		7.1		
MEAN ANNUAL TEMPERATURE	Deg F		67.0		
ABSOLUTE HUMIDITY	g/m^3		11.7		
CLIMATE FACTOR			2.0		
ROUGHNESS FACTOR	Feet		140.0		
POLARIZATION			VERTICAL		
FREE SPACE LOSS	dB		134.1		
ABSORPTION LOSS	dB		.2		
FIELD MARGIN	dB		1.0		
DISPERSIVE FADE MARGIN	dB		61.0		
TRANSMIT POWER	dBm		30.0		HOT-STANDBY
ATPC POWER REDUCTION	dB		0.0		
MAXIMUM RECEIVED SIGNAL	dBm		-22.0		
RECEIVER THRESHOLD	dBm		-80.5		BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-37.6		-37.6	
THERMAL FADE MARGIN	dB	42.9		42.9	
MINIMUM FADE MARGIN	dB	26.0		26.0	
EXTERNAL INTERFERENCE FM	dB	N/A		N/A	
FLAT FADE MARGIN	dB	42.9		42.9	

SYSTEM: Riverside County CA
 ROUTE: Motorola Radio Replacement
 FILE: Y:\CUSTOMER\FEASIBLE\RIVERCO.CA\MOTOREPL.CA\RECORD-1

Alcatel-Lucent	Feasibility	Ranger Peak	Snow Peak
TROYER		NAD83 33 50 36.6 N 116 49 30.6 W	NAD83 34 02 15.5 N 116 48 48.1 W
GROUND ELEVATION	Feet	5067.9	7901.4
MAIN ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
MAIN ANTENNA GAIN	dBi	39.5	39.5
MAIN RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
MAIN CENTERLINE	Feet	55.0	55.0
MAIN FEEDER LENGTH	Feet	85.0	85.0
MAIN FEED LOSS IN dB/100	Feet	1.3 E65	1.3 E65
MAIN FEEDER LOSS	dB	1.1	1.1
PROTECT CHANNEL LOSS	dB	11.7	11.7
OTHER FEEDER LOSSES	dB	.6	.6
OTHER TRANSMIT LOSSES	dB	1.9	1.9
OTHER RECEIVE LOSSES	dB	2.8	2.8
CALCULATED EIRP	dBm	67.9	67.9
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR67-L128F5-25	
FREQUENCY BAND	MHz	6700	
PATH LENGTH	Miles	13.4	
MEAN ANNUAL TEMPERATURE	Deg F	67.0	
ABSOLUTE HUMIDITY	g/m ³	11.7	
CLIMATE FACTOR		2.0	
ROUGHNESS FACTOR	Feet	140.0	
FREE SPACE LOSS	dB	135.7	
ABSORPTION LOSS	dB	.2	
FIELD MARGIN	dB	1.0	
DISPERSIVE FADE MARGIN	dB	60.0	
TRANSMIT POWER	dBm	32.5 HOT-STANDBY	
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-22.0	
RECEIVER THRESHOLD	dBm	-81.0 BER= 10 ⁻⁶	
MAIN RECEIVED SIGNAL	dBm	-34.5	-34.5
THERMAL FADE MARGIN	dB	46.5	46.5
MINIMUM FADE MARGIN	dB	35.0	35.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	46.5	46.5
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	5.1	5.1
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	.2	.2
TOTAL MULTIPATH 2-WAY	seconds	10.6	
UPFADE OUTAGE 2-WAY	seconds	0.0	
PATH AVAILABILITY 2-WAY	percent	99.9999663	10.6 sec
OUTAGE OBJECTIVE YEAR	percent	99.9999000	31.5 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

SYSTEM: Riverside County CA
 ROUTE: Motorola Radio Replacement
 FILE: Y:\CUSTOMER\FEASIBLE\RIVERCO.CA\MOTOREPL.CA\RECORD-1

Alcatel-Lucent	Feasibility	Redondo Mesa	Billy Goat
TROYER		NAD83 33 29 47.1 N 117 20 41.2 W	NAD83 33 27 58.0 N 116 51 26.0 W
SPACE DIV IMPROVE FACTOR	THERMAL	200.0	200.0
MULTIPATH OUTAGE SECONDS	THERMAL	.6	.6
SPACE DIV IMPROVE FACTOR	DIGITAL	200.0	200.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH	2-WAY	seconds	1.3
UPFADE OUTAGE	2-WAY	seconds	0.0
PATH AVAILABILITY	2-WAY	percent	99.9999959 1.3 sec
OUTAGE OBJECTIVE	YEAR	percent	99.9999000 31.5 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE
- PATH IN GEOSTATIONARY SATELLITE ORBIT

SYSTEM: Riverside County CA
 ROUTE: Motorola Radio Replacement
 FILE: Y:\CUSTOMER\FEASIBLE\RIVERCO.CA\MOTOREPL.CA\RECORD-1

Alcatel-Lucent	Feasibility	Redondo Mesa	Billy Goat
TROYER		NAD83 33 29 47.1 N 117 20 41.2 W	NAD83 33 27 58.0 N 116 51 26.0 W
GROUND ELEVATION	Feet	2783.8	2473.9
MAIN ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
MAIN ANTENNA GAIN	dBi	39.5	39.5
MAIN RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
DIVERSITY ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
DIVERSITY ANTENNA GAIN	dBi	39.5	39.5
DIVERSITY RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
MAIN CENTERLINE	Feet	55.0	55.0
MAIN FEEDER LENGTH	Feet	85.0	85.0
MAIN FEED LOSS IN dB/100	Feet	1.3 E65	1.3 E65
MAIN FEEDER LOSS	dB	1.1	1.1
DIVERSITY CENTERLINE	Feet	25.0	25.0
DIVERSITY FEEDER LENGTH	Feet	55.0	55.0
OTHER FEEDER LOSSES	dB	.6	.6
OTHER TRANSMIT LOSSES	dB	1.3	1.3
OTHER RECEIVE LOSSES	dB	1.6	1.6
CALCULATED EIRP	dBm	68.5	68.5
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR67-L128F5-25	
FREQUENCY BAND	MHz		6700
PATH LENGTH	Miles		28.2
MEAN ANNUAL TEMPERATURE	Deg F		63.4
ABSOLUTE HUMIDITY	g/m ³		12.0
CLIMATE FACTOR			2.0
ROUGHNESS FACTOR	Feet		140.0
FREE SPACE LOSS	dB		142.1
ABSORPTION LOSS	dB		.5
FIELD MARGIN	dB		1.0
DISPERSIVE FADE MARGIN	dB		60.0
TRANSMIT POWER	dBm		32.5
ATPC POWER REDUCTION	dB		0.0
MAXIMUM RECEIVED SIGNAL	dBm		-22.0
RECEIVER THRESHOLD	dBm		-81.0
			HOT-STANDBY
			BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-39.5	-39.5
DIV RECEIVED SIGNAL	dBm	-39.1	-39.1
THERMAL FADE MARGIN	dB	41.5	41.5
SPACE DIV THERMAL FM	dB	41.9	41.9
MINIMUM FADE MARGIN	dB	35.0	35.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	41.9	41.9

SYSTEM: Riverside County CA
 ROUTE: Motorola Radio Replacement
 FILE: Y:\CUSTOMER\FEASIBLE\RIVERCO.CA\MOTOREPL.CA\RECORD-1
 REF: RAIN CURVE 64 - LOS ANGELES CALIFORNIA USA

Alcatel-Lucent		Feasibility	Box Springs		Ben Clark	
TROYER			NAD83 33 57 43.9 N		NAD83 33 52 37.2 N	
			117 16 51.2 W		117 18 11.5 W	
SPACE DIV IMPROVE FACTOR	THERMAL	1.0			1.0	
MULTIPATH OUTAGE SECONDS	THERMAL	1.9			1.9	
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0			1.0	
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0			0.0	
TOTAL MULTIPATH	2-WAY	seconds			3.9	
UPFADE OUTAGE	2-WAY	seconds			0.0	
CRANE RAIN OUTAGE	2-WAY	seconds			.2	
PATH AVAILABILITY	2-WAY	percent	99.9999868		4.2 sec	
OUTAGE OBJECTIVE	YEAR	percent	99.9999000		31.5 sec	

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

SYSTEM: Riverside County CA
 ROUTE: Motorola Radio Replacement
 FILE: Y:\CUSTOMER\FEASIBLE\RIVERCO.CA\MOTOREPL.CA\RECORD-1
 REF: RAIN CURVE 64 - LOS ANGELES CALIFORNIA USA

Alcatel-Lucent Feasibility		Box Springs	Ben Clark
TROYER		NAD83 33 57 43.9 N 117 16 51.2 W	NAD83 33 52 37.2 N 117 18 11.5 W
GROUND ELEVATION	Feet	3048.3	1718.5
MAIN ANTENNA SIZE	Feet	3.0 SC3-W100AC	3.0 SC3-W100AC
MAIN ANTENNA GAIN	dBi	38.1	38.1
MAIN RADOME LOSS	dB	0.0 PLASTIC	0.0 PLASTIC
MAIN CENTERLINE	Feet	30.0	20.0
MAIN FEEDER LENGTH	Feet	60.0	50.0
MAIN FEED LOSS IN dB/100	Feet	2.8 E105	2.8 E105
MAIN FEEDER LOSS	dB	1.7	1.4
PROTECT CHANNEL LOSS	dB	12.9	12.9
OTHER FEEDER LOSSES	dB	.6	.6
WET RADOME LOSS	dB	2.3	2.3
OTHER TRANSMIT LOSSES	dB	3.1	3.1
OTHER RECEIVE LOSSES	dB	3.4	3.4
CALCULATED EIRP	dBm	62.7	63.0
MAXIMUM EIRP (PART 101)	dBm	70.0	70.0
RADIO TYPE and FCC ID		95MPR10-L128F5-25	
FREQUENCY BAND	MHz	10600	
PATH LENGTH	Miles	6.0	
MEAN ANNUAL TEMPERATURE	Deg F	64.0	
ABSOLUTE HUMIDITY	g/m ³	11.0	
CLIMATE FACTOR		2.0	
ROUGHNESS FACTOR	Feet	140.0	
POLARIZATION		VERTICAL	
FREE SPACE LOSS	dB	132.7	
ABSORPTION LOSS	dB	.2	
FIELD MARGIN	dB	1.0	
DISPERSIVE FADE MARGIN	dB	60.0	
TRANSMIT POWER	dBm	30.0	
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-22.0	
RECEIVER THRESHOLD	dBm	-80.5	
		HOT-STANDBY	
		BER= 10 ⁻⁶	
MAIN RECEIVED SIGNAL	dBm	-38.4	-38.4
THERMAL FADE MARGIN	dB	42.1	42.1
MINIMUM FADE MARGIN	dB	26.0	26.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	42.1	42.1

SYSTEM: RIVERSIDE COUNTY CA
 ROUTE: 9500 UPGRADE
 FILE: Y:\CUSTOMER\FINAL\RIVRSIDE.CA\9500UPGD\RECORD-2
 REF: RAIN CURVE 64 - LOS ANGELES CALIFORNIA USA

Final Design		PLEASANTS PEAK	CORONA
SITE NAME		NAD83 33 47 43.0 N 117 36 32.0 W	NAD83 33 52 40.6 N 117 34 37.1 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	2.7	2.7
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH	2-WAY	seconds	5.4
UPFADE OUTAGE	2-WAY	seconds	0.0
CRANE RAIN OUTAGE	2-WAY	seconds	.5
PATH AVAILABILITY	2-WAY	percent	99.9999815 5.8 sec
OUTAGE OBJECTIVE	YEAR	percent	99.9999000 31.5 sec

- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

SYSTEM: Riverside County CA
 ROUTE: Motorola Radio Replacement
 FILE: Y:\CUSTOMER\FEASIBLE\RIVERCO.CA\MOTOREPL.CA\RECORD-1
 REF: RAIN CURVE 67 - SAN DIEGO CALIFORNIA USA

Alcatel-Lucent	Feasibility	Midland	Palen McCoy
TROYER		NAD83 33 50 26.0 N 114 57 19.9 W	NAD83 33 55 16.8 N 115 01 26.0 W
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	5.0	5.0
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	0.0	0.0
TOTAL MULTIPATH	2-WAY	seconds	10.1
UPFADE OUTAGE	2-WAY	seconds	0.0
CRANE RAIN OUTAGE	2-WAY	seconds	.7
PATH AVAILABILITY	2-WAY	percent	99.9999657 10.8 sec
OUTAGE OBJECTIVE	YEAR	percent	99.9999000 31.5 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE

SYSTEM: Riverside County CA
 ROUTE: Motorola Radio Replacement
 FILE: Y:\CUSTOMER\FEASIBLE\RIVERCO.CA\MOTOREPL.CA\RECORD-1

Alcatel-Lucent TROYER	Feasibility	LAKE HEMET NAD83 33 40 19.4 N 116 41 06.4 W	SANTA ROSA PK NAD83 33 32 43.0 N 116 28 09.7 W
GROUND ELEVATION	Feet	4419.6	7477.9
MAIN ANTENNA SIZE	Feet	6.0 PAD6-65B	6.0 PAD6-65B
MAIN ANTENNA GAIN	dBi	39.5	39.5
MAIN RADOME LOSS	dB	.5 FIBERGLASS	.5 FIBERGLASS
MAIN CENTERLINE	Feet	20.0	20.0
MAIN FEEDER LENGTH	Feet	50.0	50.0
MAIN FEED LOSS IN dB/100	Feet	1.3 E65	1.3 E65
MAIN FEEDER LOSS	dB	.7	.7
PROTECT CHANNEL LOSS	dB	11.7	11.7
OTHER FEEDER LOSSES	dB	.6	.6
OTHER TRANSMIT LOSSES	dB	1.9	1.9
OTHER RECEIVE LOSSES	dB	2.8	2.8
CALCULATED EIRP	dBm	68.3	68.3
MAXIMUM EIRP (PART 101)	dBm	85.0	85.0
RADIO TYPE and FCC ID		95MPR67-L128F5-25	
FREQUENCY BAND	MHz	6700	
PATH LENGTH	Miles	15.2	
MEAN ANNUAL TEMPERATURE	Deg F	65.8	
ABSOLUTE HUMIDITY	g/m ³	12.2	
CLIMATE FACTOR		2.0	
ROUGHNESS FACTOR	Feet	140.0	
FREE SPACE LOSS	dB	136.8	
ABSORPTION LOSS	dB	.3	
FIELD MARGIN	dB	1.0	
DISPERSIVE FADE MARGIN	dB	60.0	
TRANSMIT POWER	dBm	32.5	HOT-STANDBY
ATPC POWER REDUCTION	dB	0.0	
MAXIMUM RECEIVED SIGNAL	dBm	-22.0	
RECEIVER THRESHOLD	dBm	-81.0	BER= 10-6
MAIN RECEIVED SIGNAL	dBm	-34.7	-34.7
THERMAL FADE MARGIN	dB	46.3	46.3
MINIMUM FADE MARGIN	dB	35.0	35.0
EXTERNAL INTERFERENCE FM	dB	N/A	N/A
FLAT FADE MARGIN	dB	46.3	46.3
SPACE DIV IMPROVE FACTOR	THERMAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	THERMAL	7.7	7.7
SPACE DIV IMPROVE FACTOR	DIGITAL	1.0	1.0
MULTIPATH OUTAGE SECONDS	DIGITAL	.3	.3
TOTAL MULTIPATH 2-WAY	seconds	16.0	
UPFADE OUTAGE 2-WAY	seconds	0.0	
PATH AVAILABILITY 2-WAY	percent	99.9999492	16.0 sec
OUTAGE OBJECTIVE YEAR	percent	99.9999000	31.5 sec

- PRELIMINARY PATH DESIGN BASED ON TERRAIN DATA BASE
- CALCULATIONS VALID ONLY IF PATH HAS ADEQUATE CLEARANCE



MICROWAVE PATH ENGINEERING WARRANTY

FEASIBILITY STUDIES

Nokia provides feasibility studies of microwave radio paths in support of bidding efforts or when purchased by the Customer. Feasibility studies are performed using information provided by or on behalf of the Customer. Results of the feasibility study are provided to the Customer and may include (i) a system map, (ii) a path profile, (iii) path performance calculations, and (iv) a technical report.

Feasibility studies are preliminary in nature and are not intended to represent a final design. Therefore no representations, warranty or guarantee is implied or provided. Customer agrees to assume all risks associated with installing any equipment based on spiderweb maps, preliminary network and system maps, preliminary path profiles (including antenna size and location), path calculations (estimated performance), Google Earth, and topology studies normally presented with a feasibility study.

PATH SURVEYS (DETAILED SURVEY WITH REPORT)

Nokia offers detailed path surveying services to determine or verify site coordinates, site access, location, ground elevation, on-path obstruction location and height, tower information, proposed antenna centerline information, and other parameters required to engineer and implement a microwave radio link. The present and anticipated future effect of observable on-path obstructions, such as vegetation and buildings, are also evaluated and incorporated into the path design where applicable. Where appropriate, roof top access may be utilized in the survey effort. Existing towers are not climbed as a part of this activity.

The results of the path survey are documented and presented in a formal survey report or technical report, as required, to the Customer. Some items performed and included in a formal survey report may include: site location map, site topographic map, access information, site plot plans, existing tower elevation profile, site photographs, site and path observations, path terrain feature descriptions, critical point data, engineering notes, path profiles, and proposed performance calculations.

For detailed Path Surveys, Nokia warrants that geodetic coordinates are accurate to within +/- 1- second of latitude, +/- 1-second of longitude, ground elevations are accurate to within +/- 1 meter, and that heights of identified on-path obstructions at critical points are accurate to within 5-feet. Nokia warrants only the actual paths surveyed.

LINE OF SIGHT SURVEYS (LOS - CLEARANCE VERIFICATION)

Nokia offers a simplified microwave path survey service (from that described above) to determine "line of sight" (LOS) and adequate clearance conditions exist for a planned microwave link. This survey approach is best suited for urban and suburban environments. It can include driving the path as done in a traditional path survey, flashing the path, mirrors, or binoculars methodology. The line of sight survey may also ascertain site coordinates, site access and location, ground elevation, on-path obstruction location and height, tower information, proposed antenna centerline information, and other basic parameters required to

evaluate and design a microwave radio link. The present and anticipated future effect of observable onpath obstructions, such as existing vegetation and existing buildings, are evaluated and incorporated into the path design where applicable and appropriate. Where appropriate, roof top access may be utilized in the survey effort. Existing towers are not climbed as a part of this activity.

For line of sight (LOS) surveys, Nokia warrants that geodetic coordinates are accurate to within +/- 1-second of latitude, +/- 1-second of longitude, and ground elevations are accurate to within +/- 1 meter. Nokia warrants only the actual paths surveyed.

PATH DESIGN

Nokia offers path design services. Path design services are based on formal field survey data gathered by Nokia path surveyors and is warranted. Path designs include profiling a path to determine antenna centerline requirements, and path calculations to determine the antenna and radio types necessary to meet the Customer's microwave link performance and availability objectives. Recommended antenna centerlines are determined for a range of K-factors expected to occur during an average year and by the Fresnel zone clearance criteria stipulated by Bell Laboratories. For areas where poor propagation conditions are known to exist, paths are assessed for susceptibility to obstruction fading outages using the Bell Laboratories Obstruction Fading (OBSFAD) model. Additionally, paths are analyzed for ground-based reflections.

Microwave link availability (path availability) is evaluated using current North American industry accepted models for predicting outage times and diversity improvement factors associated with normal atmospheric multipath fading (flat and dispersive), rain fading, and obstruction fading. Every effort is made by Nokia to anticipate the probable occurrence of abnormal propagation conditions based on historical documentation, experience, geographical location, and field survey data.

The final path design documentation will include one or more of the following, depending on the services purchased by the Customer: (i) a system map, (ii) a final path profile, (iii) final path performance calculations, and (iv) a technical report.

If a radio path using Nokia equipment is installed based on Nokia's recommended path design, then Nokia warrants the radio path calculations shall conform to the Customer's availability objective for normal atmospheric multipath fading. Nokia will not be held responsible for excessive outages or degraded performance due to abnormal fading conditions. Abnormal fading conditions include, but are not limited to:

Formation of extreme radio refractivity gradients associated with:

- Exceptionally large temperature inversions
- Abnormal temperature/humidity layers
- Fog formation
- Signal trapping caused by surface or atmospheric ducting

Reflections from unusual or unidentifiable on-path or off-path terrain features, physical structures, or atmospheric layers.

Rain fading due to rainfall rates that are in excess of the published rates or charts used to predict rain induced outages.

If Nokia suspects that abnormal propagation conditions are the cause of degraded system performance, Nokia will assist the Customer in verifying the conditions leading to the degraded system performance. After the problem has been identified, Nokia will support the Customer in identifying possible solutions to the problem and assess the incremental improvement expected from corrective actions. Any implementation of corrective action to remedy this type of problem shall be the sole responsibility of the Customer.

FREQUENCY PLANNING

Nokia offers frequency planning services including frequency selection, prior coordination process, interference case resolution, and FCC license application documentation preparation and submittal. Nokia warrants that the interference studies will be conducted using industry-accepted North American methods, hardware, software and algorithms; and that the frequency database will be maintained as accurately as possible at the time of the study. Nokia will not be held responsible for interference cases that arise due to errors or omissions in the database. Upon completion of the frequency planning services, some or all of the following documentation is provided to the Customer:

- Prior Coordination Notice
- Frequency Coordination Data Sheet
- Supplemental Showing pursuant to FCC Rules Part 101.103(d)
- Completed FCC Form 601 License Application and Preparation

In the event harmful frequency interference is detected during the implementation of a microwave line in which Nokia provided the frequency planning services, Nokia's total liability is limited to selection of an alternate frequency or frequencies. Should harmful interference occur after the microwave link is deemed operational and accepted, corrective action is the sole responsibility of the Customer.

WARRANTY

Nokia warrants its path surveys and path designs to be substantially free of engineering defects and errors for a period of 12 months from the date of delivery of the study to the Customer. Nokia warrants its line of sight surveys to be substantially free of engineering defects and errors for a period of 6 months from the date of delivery of the study to the Customer. Nokia warrants its frequency planning and Form 601 License Application preparation to be substantially free of engineering defects and errors for a period of 6 months from the date the path was prior coordinated. Except as further limited above, in the event of a proven breach of warranty, the Customer's sole remedy under this warranty shall be that Nokia will provide the incremental labor and material beyond what would have been required during initial installation to correct for the particular error in the path survey or path design. In no case shall Nokia be held liable for any indirect damages including but not limited to incidental, consequential or loss of capital, data, revenue or profit. In the event that such error is not solely and directly related to Nokia's path engineering efforts, expenses for such labor and material shall be borne by the Customer.

9.2 IP ROUTING MAINTENANCE STATEMENT OF WORK

9.2.1 Services

This SOW covers maintenance services for IP Routing and Microwave equipment deployed in the County of Riverside's network. Motorola Solutions will provide these services through a subcontract with Nokia of America ("Nokia"). In addition to the Motorola Solutions Service Agreement, the services will be subject to the Nokia Maintenance Terms and Conditions included at the bottom of this document.

Nokia and the County of Riverside, will perform the responsibilities assigned to them, respectively, in this SOW.

Table Legend: N=Nokia; C=Customer (aka: County of Riverside)

Tasks	N	C
Provide remote access to engineers for product-related questions, troubleshooting, diagnostics, and patch/maintenance releases to restore service and/or functionality and resolve problems for Maintained Products.	X	
Provide 24/7 access via phone or email to the Nokia Welcome Center or, if available, via web-based Online Customer Support in order to open an Assistance Request ("AR"). The Nokia Welcome Center will assign each AR a unique trackable number in order to facilitate communication and enable rapid assistance.	X	
Troubleshoot problems via phone, or virtual private network, down to Maintained Product component level, or sufficiently to exclude Maintained Products as the root cause.	X	
Provide access to Patch Releases or Maintenance Releases for Maintained Products, when available. Customer shall provide its own means to install such fixes, patches, and updates, as and when made available by Nokia.	X	
Provide standard instructions for installation of Patch Releases or Maintenance Releases to Customer.	X	
For Severity Level Critical (Severity 1) and Major (Severity 2), restore Maintained Products to operational status by identifying defective hardware components or providing software and/or procedural workarounds, where feasible. All software workarounds are licensed subject to the same terms, restrictions, and limitations as contained in the licenses under which the software was acquired.	X	
Provide 24x7 access to product specific Customer Support content of the Nokia.com web site if available for the Maintained Products. Customer Support content may include technical product support information, subscription services, and other self-help facilities, as well as the ability to submit non-critical ARs and check the status of ARs online.	X	
Technical Support covers Maintained Products installed and integrated by Nokia or by Customer trained by Nokia on self-install and self-integrate programs, if available. Otherwise, issues arising are not covered by Technical Support or may be subject to additional charges.	X	



Tasks	N	C
On-site support is not specifically provided as part of this SOW. If Nokia determines that it cannot restore or resolve an issue remotely, Nokia may, at its sole discretion, provide emergency on-site support. In the event on-site intervention is performed, the travel time to arrive at the Site will be added to the Restore time target or discounted from the Restore interval.	x	
Repair or exchange from Nokia inventory RES Entitled Parts at Customer's request. Deliver Parts to Customer's Entitled Site by the applicable RES Delivery Deadline.	x	
Provide a specific form to be used by Customer to record the failure description of the Part.	x	
Upon receipt of Customer's Part Request from, provide a Functioning Part from the list of RES Entitled Parts within the RES Delivery Time in advance of the Defective Return from Customer.	x	
Provide instructions on where Customer is to ship Defective Returns.	x	
Notify Customer within thirty (30) days if Customer has failed to meet their obligations concerning the prompt return of defective Parts.	x	
With each returned part, attach to the exterior of the shipping container all relevant documentation (failure description, diagnostic results, serial number, part request number).		x
Assist in minimizing No Fault Found (NFF) by using technical support, complying with manufacturer diagnostic procedures, and being familiar with manufacturer's published references.		x
Provide adequate packing material to protect against damage during shipping.		x
Manage electrostatic discharge (ESD) sensitive material with appropriate protection to avoid ESD damage.		x
Be responsible for all transportation related expenses (labeling, packaging, shipping, insurance) for the part shipped to Nokia.		x
Ensure that delivery site is ready to receive repaired/exchanged part. Delays and repeat attempts to deliver parts relieves Nokia of its RES Delivery Deadline obligations and may result in additional charges.		x
Upon receiving the replacement Part, Customer will ship or return the reported defective Part to Nokia within five (5) Calendar Days following the shipping instructions.		x
Diagnose and isolate the faulty part in cooperation with Nokia technical support if required.		x
Initiate part request through the Welcome Center, internet portal, or e-mail. Time critical requests must go through the Welcome Center.		x
Provide company name and contact information, product name, service, entitled site company name and address, contract name, serial numbers.		x
Unreturned parts: Failure to return faulty part will require payment of the published price of the part plus a \$500 restocking fee. Customer will acknowledge Nokia notifications regarding unreturned parts with 14 days and issue a PO or provide proof that the claim does not apply within 30 days.		x

Tasks	N	C
Software Subscription Plan (SSP)		
<p>Provide all Feature Releases of software for network/node elements, management systems for specific network elements or families of network elements, and other network-related applications.</p> <ul style="list-style-type: none"> - Applies to Generally Available products. - May include third party software if supported and licensed through Supplier. - Includes Feature Releases as well as Patch Releases and Maintenance Releases. - Applies to the following "Products/Features Covered": <ul style="list-style-type: none"> o 86x 7705 SAR-8/18 o 1x 5620 SAM o Note: if a Feature Release contains a new feature for which an additional license/activation fee is required, this must be purchased separately. 	X	
Distribute Feature Releases via Internet download, CD, DVD, tape, or file transfer protocol (FTP).	X	
Provide Release Notes, list of changes, and procedural updates.	X	
Provide new/upgraded firmware for control card (if required).	X	
Distribute Patch Releases and Maintenance Releases via Internet download, CD, DVD, tape, or file transfer protocol (FTP).	X	
Provide a softcopy or hardcopy of a generic procedure document on how to upgrade the Product(s). Where installation services are provided, this documentation will not be provided.	X	
<p>Prior to commencement of SSP:</p> <ul style="list-style-type: none"> - Have Technical Support (TS) agreement in effect prior or simultaneously with the SSP term. 		X
<ul style="list-style-type: none"> - Provide commercially available computing hardware for the Products according to product specifications. - Update the "Products/Features Covered" information on an annual basis or allow Supplier to perform an audit of Customer's network at Customer's expense. - Allow Supplier to verify the accuracy of the reported parts shown as "Products Covered." - For selected products specified by Supplier, engage Supplier to perform the installation of any Release. 		X
<p>Responsibilities related to the Feature Release download:</p> <ul style="list-style-type: none"> - Designate in writing the Customer contact responsible for receiving downloads. - Not allow access to any other person. - Requests for access for a non-employee will require a non-disclosure agreement and will be at Supplier's sole discretion. - Notify Supplier in writing immediately of any change in the employment or authorization status of any personnel with authorized access. - Comply with terms of use stated on the download site. 		X

9.2.2 Service Notes Technical Support

- SLA Targets apply to Maintained Products running on hardware and software Releases that are in Generally Available (GA) status and consequently will not apply to either pre-GA or Support Ended hardware/software.
- "Support Ended" means the product has reached its end of life and is no longer sold by Nokia and customer requests for troubleshooting, advice, information or assistance are no longer performed. The Support Ended status is announced to customers publicly and in advance of the date that it is in effect.
- Does not include preventive maintenance.
- If the Customer purchases or collocates additional products of the same type for which Maintenance Services are in effect or additional license capacity during the Initial Term or any Renewal Term, the Customer will pay the pro-rated maintenance fees in advance of coverage at the standard rate stated below for the additional products or license capacity based on the number of months remaining in the applicable Term, starting on the dates on which the new products were put into service. The Customer shall provide an update of any change in quantities on Maintained Products on a quarterly basis or otherwise agreed to in writing. Updates must occur annually at a minimum. However, notwithstanding the foregoing, an immediate update is required if the Customer increases the quantity of the Maintained Products by more than 10% at any time.
- The Customer must purchase Maintenance Service coverage for all products in its network of the types for which Maintenance Services are in effect under this SOW. The Customer shall allow Nokia, if Nokia deems it necessary, to verify the accuracy of the Maintained Products, by reasonable means.

9.2.2.1 RES Advanced Exchange (RES-AE)

- Repaired or exchanged Parts may contain components that are used, remanufactured or refurbished. Exchanged Parts will be Form, Fit and Functionally compatible.
- Nokia has internal Root Cause Analysis (RCA) processes in place to address failure trends that extend beyond individual isolated failures. If the customer experiences or suspects a failure trend, they may request an RCA through the Welcome Center. This request will trigger a Quality Hardware Engineer to review the case. If evidence points to a possible failure trend, the RCA request will be approved and part(s) will go through the RCA process. However, if there is no evidence of a failure trend, the RCA request will be denied and the RMA process will proceed as normal to replace the failed part as agreed through the Advanced Exchange service.
- RES does not include:
 - Part modification or upgrade.
 - Root cause analysis that specifies the actual Part failure cause or any specific remedial action.
 - Repair or exchange of Parts with defects or malfunctions caused directly or indirectly by: (1) failure of non-Nokia personnel to follow the manufacturer's installation, operation, or maintenance instructions; (2) Products or their Parts not specifically identified as RES Entitled Products or RES Entitled Parts; (3) abuse, misuse, or negligent acts of non-Nokia personnel; (4) damage from fire, water, wind, exposure to weather, or other forces of nature; (5) acts of terrorism, vandalism or other hostile actions.
 - Repair or exchange of Parts that show evidence of: (1) improper packaging; (2) improper handling; (3) modification by non-Nokia approved personnel; (4) the installation or attachment of non-Nokia or non-OEM approved components including hardware or software; (5) any condition that exceeds the tolerances as prescribed by the



manufacturer. Passive and mounting hardware such as cabinets, chassis, frames, antennae, connectors, cables, cable assemblies, cords, brackets, bezels, faceplates, adapters, panels or labels.

- Consumables such as batteries, air filters, or transformers.
- Documentation or software in all media forms.

9.2.2.2 Software Subscription Program (SSP)

- License Terms of Feature Releases: All software that is provided in connection with the Service is licensed subject to the same terms, restrictions, and limitations as contained in the licenses under which the original software was acquired.
- The following items must be purchased separately by the Customer:
 - Any modifications to any parts of the network which are deemed by Supplier necessary to accomplish network compatibility with a Feature Release.
 - Any additional products required to take advantage of any new functionality within a Feature Release.
 - Any additional software licenses required to support growth in the network of hardware or software (e.g. nodes, DSL ports, subscribers, seats, etc.).
 - Any features in a Feature Release for which an additional license or activation fee is normally required.
 - Where required, a minimum of 12 weeks lead-time must be provided for all Firmware orders (i.e., PROMs – Programmable Read-Only Memory).
- The Customer must purchase the Service in conjunction with Technical Support service or equivalent from Supplier; these services are not sold separately.
- For each Product Covered, the quantity specified must include absolutely all such parts found in the Customer's network. Partial quantities in the Customer's network are not permitted.
- After the Effective Date of the Service, changes in Products Covered, will follow one of the following schemes:
 - Network Growth Scheme 1: upon the anniversary of the Effective Date, Supplier will back-charge Customer a pro-rated amount and update the subsequent annual charge.
 - Network Growth Scheme 2: upon the anniversary of the Effective Date, the Customer will be charged a corresponding increase/decrease in the annual fee for that Renewal Term and subsequent Renewal Terms.
- SSP does not include performing the installation of the software releases in the Customer's network.
- Without limiting Supplier's other rights, Supplier may deny access immediately and in the future to individuals using the download site other than as permitted. Supplier shall have no liability to the Customer on account of such denial.
- If the Customer is not forthcoming with updates to the "Products Covered", and If Nokia has reason to believe that the Customer is not over time compliant with these specifications, then NOKIA may request access from the Customer to allow Nokia to perform an audit of its network, which may lead to the decision to revalidate the Maintained Products. NOKIA must present definitive and substantive proof to the County of Riverside that a revalidation of the Maintained Products is both warranted and necessary. A change order will be presented to the Customer to reflect any requested revalidation.
- Possible New Release Roadmaps: The forecast of future software releases (product roadmap) is provided by Supplier solely to inform the Customer of Supplier's plan of record for the relevant product(s) and both parties to this SOW hereby agree that such information does not form a commitment of any kind on either party in relation to this contract. There are



no penalties, liquidated damages or other remedies associated with changes to the product roadmap including cancellation of any specific feature or functionality or delay in the timing of development.

Service Level				
Welcome Center				
AR Problem Classification		Low	Medium	High
Technical Support	Support Window			
	Respond	30 M	1 H	NBD
	Restore	1 H	2 H	
	Resolve	1 CD	2 CD	NT
KPI Achievement				
Legend: AR = Assistance Request (trouble ticket) BD = Business Day of applicable Nokia technical support facility BH = Business Hours of applicable Nokia technical support facility CD = Calendar Day D = Day H = Hours M = Minutes NBD = Next Business Day of applicable Nokia technical support facility NT = No Target. Nokia will use commercially reasonable efforts to perform the corresponding activity, if feasible at Nokia's sole discretion.				

Figure 9-1: SLA Targets for Technical Support (TS)

Table 9-1: Maintained Products and Scope of Services

Equipment	Quantity	Location	Services	Support Level
7705 SAR-8/18	86	TBD	TS, RES, SSP	Gold, AE1BD
5620 SAM	1	TBD	TS, SSP	Gold
9500 MPR	308 T/Rs	TBD	TS, RES	Gold, AE1BD

9.2.3 Maintenance Terms and Conditions

9.2.3.1 Definition of Severity Levels

“Critical” (Severity Level 1 or SL1): The system is inoperative and the Customer’s inability to use the product has a critical effect on the Customer’s operations. This condition is generally characterized by complete system failure and requires immediate correction. In addition, any condition that may critically impact human safety is considered a Severity Level 1 Critical problem.

“Major” (Severity Level 2 or SL2): The system is partially inoperative but still usable by the Customer. The inoperative portion of the product severely restricts the Customer’s operations, but has a less critical effect than a Severity Level 1 condition.

“Minor” (Severity Level 3 or SL3): The system is usable by the Customer, with little or limited impact to the function of the system. This condition is not critical and does not severely restrict overall Customer operations.

9.2.4 Definitions of TS Key Performance Indicators

“Respond Time” (Specialist Call-back): The time period from when the Customer first notifies the Nokia Welcome Center of a reported problem to when a Nokia expert attempts to contact the Customer via telephone or preferred contact method as defined when submitting the request. In the event Nokia is unable to contact the Customer after three (3) attempts, the ticket will be closed.

“Restore Time” (Remote Neutralization): The time from when Nokia is contacted and an event is determined to be loss of service and/or functionality affecting, to the time when Nokia provides the means to return a system to operational status.

“Resolve Time” (Final Resolution Time): The time from when the Customer first notifies the Nokia Welcome Center to the time when a procedural solution/fix to address the issue is made available to the Customer. This may occur simultaneously with Restore Time, unless the Restore Time is by means of a temporary workaround and Nokia determines that a more suitable permanent solution can feasibly be provided.

9.2.4.1 Service Level Agreement (SLA) Targets

SLA Targets specify the performance objectives in terms of KPIs by severity level. SLA Targets vary depending on the maintenance coverage selected (see SLA Target table).

9.2.4.2 Patch Releases/Maintenance Releases

TS Service includes only patch releases and maintenance releases as may be made available for Nokia Maintained Products during the Term for use with Maintained Products. TS Service does not include access to feature releases. Decisions of which versions of software will be updated, and whether to include a correction in a maintenance release as opposed to including it in the next feature release, rests in Nokia’s sole discretion. TS Service does not entitle or support the Customer to use optional or new software features resident in a maintenance release or feature release, except to the extent that the Customer has separately paid the applicable license fees for the use thereof. Nokia shall have the sole right to determine whether a new functionality shall be included in a feature release or as an optional software feature.

9.2.4.3 License Terms

All software that is ultimately provided in connection with TS Service including, without limitation, maintenance releases, patch releases or workarounds, are licensed subject to the same terms, restrictions, and limitations as contained in the licenses under which the original software was acquired.

9.2.4.4 Lab System

TS Service is intended for Maintained Products deployed commercially in a communications network. Coverage may be extended to Maintained Products used in the Customer's own lab for testing purposes before and during commercial use in the Customer's network if such lab use is identified on the SOW. In the event TS Service is provided to Maintained Products in the Customer's lab, such TS Service will be provided during Business Hours, on Business Days, without regard to the Support Level applicable to the Customer's other Maintained Products. Only the Next Business Day Respond Time KPI indicator will apply.

9.2.4.5 Customer Service Delivery Feedback/Escalation

The Customer may escalate a problem or provide feedback on the TS Service that is being delivered or has been delivered. Service Delivery Feedback is for tasks and provision of deliverables specifically defined in this document. The Customer may initiate escalation or feedback by calling the Welcome Center number and ask to speak to the duty manager to escalate an open AR or create a Service Delivery Feedback AR.

9.2.4.6 Customer Responsibilities Concerning Nokia Web Site Access

By accessing any Nokia.com web site, the Customer agrees to the following:

- The Customer shall not enable or permit Web site access to any person other than its employees, without Nokia's prior written consent.
- If requesting such consent, the Customer shall identify to Nokia any non-employee who the Customer would like to be able to have access to the Web site, and if requested by Nokia, will provide a copy of a Non-Disclosure Agreement executed between the Customer and the non-employee in accordance with the confidentiality terms of the agreement pursuant to which the Maintained Products were supplied. Such agreement will provide, at a minimum, the level of protection provided in the Agreement to which this SOW is attached. Nokia may refuse consent within its sole discretion.
- The Customer may use, and shall require its non-employee contractors or Agents to use the OLCS (Online Customer Support) content only to facilitate its managing and operating the Maintained Products. Other than the limited right to use OLCS content for the purpose described in the preceding sentence, Nokia does not grant any rights, title or interest, explicitly or implicitly, under any patent, copyright, mass work protection right, trade secret or any other intellectual property right. Some OLCS content made available to the Customer may not be made available to non-employees.
- The Customer must notify Nokia in writing immediately of any change in the employment or authorization status of any personnel having authorized access to the Web site.
- Access to OLCS is not available to US embargoed countries. Information on the OLCS website (e.g., product documentation, ticket status, software fixes, etc.) can be provided to customers by their technical support engineer.
- The Customer's use of any Nokia.com web site is subject to all Terms of Use then set forth or linked to the web site. Such Terms of Use shall in no event be construed to increase Nokia's obligations under this SOW nor to create or modify any performance indicators for the Services under this SOW.

Without limiting Nokia's other rights, Nokia may deny access immediately and in the future to individuals using the web site other than as permitted. Nokia shall have no liability to the Customer on account of such denial.

9.2.4.7 General Customer Responsibilities

- When reporting an AR, and in order to have the AR validly created:
 - Include Severity Level of problem, outage status, product name, contract number, submitter name and location, callback telephone number and/or email address, system name and location, type and serial and/or license number, and alternate contact.
 - Provide all information necessary for Nokia to provide the Services without delay on the Maintained Products. This includes, without limitation: identification of the releases of the Maintained Products; network configuration; evidence of problem on the Maintained Products; logs, traces and product diagnostic results for the Maintained Products and for all the components of the environment of the Maintained Products; evidence that resources allocation has been aligned with Maintained Product needs, as defined in Maintained Products' documentation; already performed actions; any information to help reproduce the conditions under which the trouble occurred.
 - Ensure that only submitters that are trained by Nokia on Operations and Maintenance of the Maintained Products are entitled to report an AR. The Customer shall keep updated and shared with Nokia the list of entitled submitters.
- Ensure that the Maintained Products are, over time, installed, configured, operated, administrated and maintained in accordance with Nokia's applicable installation, configuration, operation, administration, and maintenance specifications. If Nokia has reason to believe that the Customer is not over time compliant with these specifications, then NOKIA may request access from the Customer to allow Nokia to perform an audit of its network, which may lead to the decision to revalidate the Maintained Products. NOKIA must present definitive and substantive proof to the County of Riverside that a revalidation of the Maintained Products is both warranted and necessary. A change order will be presented to the Customer to reflect any requested revalidation.
- Ensure the implementation of all software updates, firmware updates and hardware changes required by Nokia within a reasonable time, not to exceed sixty (60) days from the date of availability.
- Ensure that adequate resources are made available to Maintained Products, as defined in Maintained Products' documentation. In case of a software only product, the resources include, but are not limited to, CPU, memory, IO disk and network.
- Notify in writing any changes in Maintained Products (as described in section or appendix covering "Maintained Products and Scope of the Services") including, but not limited to quantity or location of Maintained Products, no less than ninety (90) days prior to the start of the initial or renewal Entitlement Term or to any changes to the Maintained Products or any changes in the Sites.
- Allow Nokia, if Nokia deems it necessary, to verify the accuracy of the Maintained Products status by reasonable means.
- Grant Nokia access to the inventory information of the Maintained Products at least twice a year, either by allowing Nokia to retrieve this information remotely, or by providing this information to Nokia.
- Maintain a procedure external to the software programs for regular back-up (software, configuration) and for reconstruction of lost or altered files, data, and/or programs.
- Perform initial problem diagnostics and analysis to isolate the problem to Maintained Products.
- Ensure availability of employees which are trained by Nokia on Operations and Maintenance of the Maintained Products to assist Nokia's personnel. This may include, without limitation, assistance in performing additional tests, and gathering additional information. Any delay time caused by the Customer shall be deleted from KPI measurements.

9.2.4.8 Remote Connection

Remote Connection is mandatory for Nokia to be able to provide the Services for the Maintained Products.

An exception is 1357 ULIS or other lawful intercept products for which law enforcement agencies may prohibit remote connection. Support of such products is provided by telephone and Nokia will work with Customer's on-site authorized personnel to troubleshoot problems.

Specific Service Level Agreements ("SLA") described, if applicable, in the section "Service Level Agreement Targets" then apply.

The Remote Connection can be established from Nokia's local site, one of the Nokia TSCs (Technical Support Center), the Nokia TEC (Technical Expert Center), Nokia NOC (Network Operations Center), or from an OEM Company or third party service provider (contracted by Nokia for providing support Services for OEM software or hardware).

Customer shall at its risk and expense provide Nokia with the necessary infrastructure to complete a remote connection to the Site. The preferred tool is RAMSES or any other mutually approved tool.

- A Remote Connection with the following mandatory characteristics must be available:
 - Secure solution based on a permanent LAN to LAN IPSEC using efficient security solution (e.g., firewall)
 - Minimum bandwidth of 2Mbits/s in both directions
 - Transfer file system enabling large file transfer through secure connections (e.g., SFTP)
 - Multi session system enabling a parallel connection of experts, through secure connections (e.g., SSH)
- The Remote Connection should not:
 - Require a dedicated internet line
 - Rely on any hardware token system

If, due to reasons beyond the control of Nokia, the Remote Connection cannot be established or is established with unsatisfactory quality or bandwidth, the KPIs specified in the "Service Level Agreements" shall be extended for the same period during which the Remote Connection could not be established. In this situation, Nokia reserves the right, and upon consent of Customer, to send skilled personnel to the site to resolve the problem. Separate terms and fees apply.

9.2.4.9 Maintenance Exclusions

Maintenance does not include:

- Support when the Customer responsibilities as described in this SOW are not realized.
- Support for custom software features not named in this SOW as Maintained Products, that is, any features that are not present in the generally available version of the Maintained Products.
- Creating or making corrections to the Customer-specific reports.
- Providing Customer-specific instructions for installation of Patch Releases or Maintenance Releases by the Customer.
- Making specification changes or performing services connected with installation or relocation of the Maintained Products.

- Support for non-maintained products, whether or not they reside on the same computing hardware platform on which Maintained Products reside.
- Assistance or service, including without limitation, modification or replacement of the Maintained Products, repair of damage, or increase in service time caused by or required as a result of any of the following:
 - Failure to continually provide a suitable operational environment with all facilities prescribed by the applicable product specifications document including, but not limited to, the failure to provide, the failure of, or faulty, adequate electrical power, air conditioning, or humidity, dust control.
 - Use of the Maintained Products in a manner not in accordance with its specifications, operating instructions, or license-to-use.
 - Maintenance, repairs, or other services resulting from casualty, catastrophe, natural disaster (which shall include, but not be limited to, fire, flood, earthquake, water, wind or lightning), accident, transportation difficulties, terrorism or other hostile action, neglect by the Customer, negligence of the Customer, or misuse by the Customer.
 - In the event of a service interruption caused by accident, disaster, or terrorism Nokia will make a commercially reasonable attempt to restore service on the Maintained Products. If, however, service is not restored within 12 hours, Nokia and the Customer will mutually agree on next steps to be taken, which may include the purchase of disaster recovery services to restore service. Additionally, the commercially reasonable efforts contemplated by this provision do not include the provision of new, replacement, or additional hardware or software or performance of on-site services, which if available would require payment of additional charges.
- Modifications, maintenance, or repair performed by other than Nokia designated personnel, including changes, modifications or alterations not authorized by Nokia in the Maintained Products, the hardware, or the software environment in which the Maintained Products operate including, without limitation, the introduction of updates of third party software or hardware that have not been validated by Nokia.
- Attachment of unspecified or non-approved products to the Maintained Products, or failure of a processor or other equipment or software not maintained by Nokia, or failure of removable or rotating storage media.
- Database problems: If the condition is determined to be the result of corruption of the Maintained Products database, and such corruption is not the direct result of the Maintained Products, the condition will be referred back to the Customer. However, if corruption is the result of, or caused by, Nokia's Maintained Products, Nokia shall manage the resolution of the problem, at no additional charge; provided, however, that Nokia shall only be responsible for restoring data on the media. The Customer shall be responsible for providing Nokia with the data that needs to be restored.
- Hardware/firmware problems: When a condition has been isolated to a hardware or firmware problem on a product that is not covered under this SOW, the condition will be referred back to Customer for disposition under whatever maintenance arrangements Customer may have for such hardware or firmware.
- Other/interfacing systems problems: If the condition is determined to be caused by systems other than the Maintained Products including, but not limited to, systems that interface with the Maintained Products, then the condition will be referred to Customer for corrective action unless the other system(s) has been furnished by Nokia and is covered under this SOW, in which case Nokia shall manage the resolution of the problem.
- Equipment certification, as required per Nokia's policy on equipment not installed by an approved Nokia installer, or lapse in Maintenance coverage, or equipment that has been moved.



- Unless otherwise specified in this SOW, installation of modifications, upgrades, features, enhancements or model conversions, refinishing or refurbishing of products, TSC assistance required in support of non- Nokia manufactured equipment, or direct routine TSC assistance initiated by an individual site if TSC support is provided to a Customer staffed control center and/or centralized engineering group.
- Maintenance or repairs of accessories, attachments or any other devices not identified in this SOW.
- Furnishing of optional accessories or consumable supplies.
- Recovery of any lost data or expenses for reconstructing data lost during the performance of Maintenance Services.

9.2.4.10 Training of Customer Staff

Furthermore, should the Customer desire Services for the Maintained Products which are not under warranty or have not been under a support service agreement with Nokia, in effect immediately prior to the request for Services hereunder, the continuity of the service must be ensured with payment by the Customer of the Services from the date of end of warranty, or the date of end of the previous service agreement, plus, over and above, the payment of a reinstatement fee equal to half of this amount, prior to being eligible for support Services under this SOW.



SECTION 10

APPENDIX A-NOKIA PRODUCT ROADMAP

Nokia Product Roadmap is included on the pages that follow.



NOKIA

Next Generation Backhaul Network

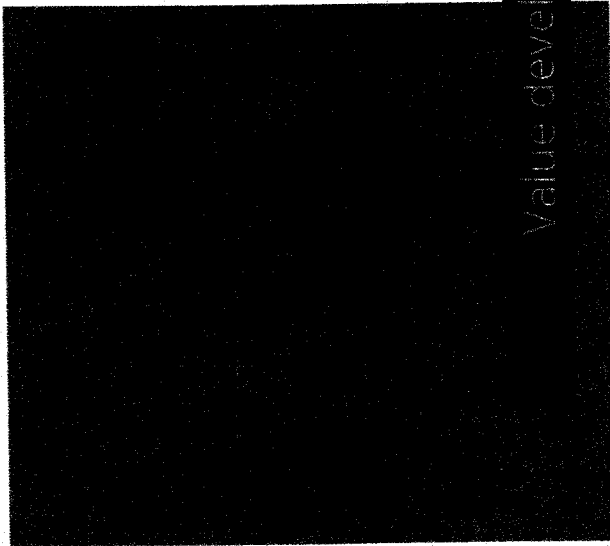
County of Riverside Product Roadmap

November 2018

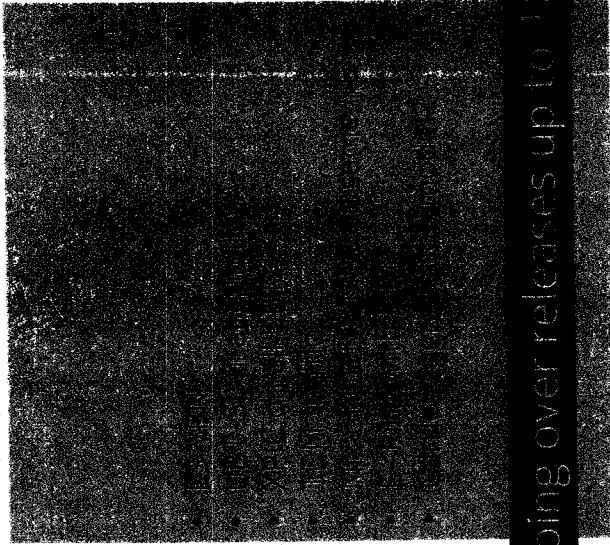
10/26/18

Wavence Product Roadmap Highlights

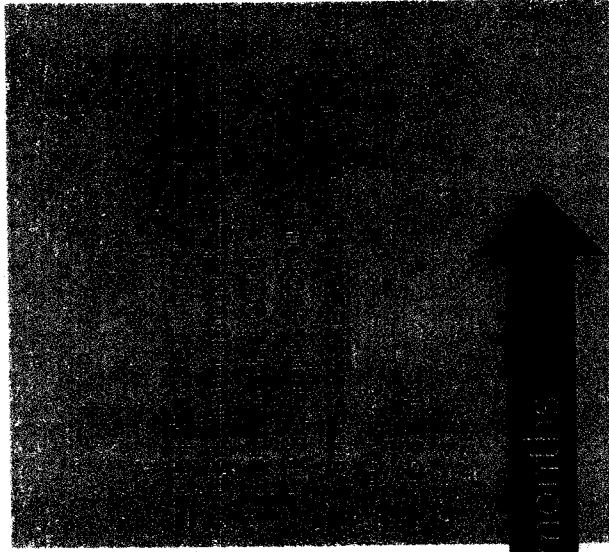
Release 18 (current)



Release 18A



Release 19



Value developing over releases up to 18 months

Nokia retains rights to modify feature release content

7705 Hardware Roadmap

R8.0 / R9.0



Release	Target S/W Release Date	Status
8.0.R6	July 2, 2017	Available
8.0.R7	September 27, 2017	Planned
8.0.R8	November 13, 2017	Candidate
8.0.R9	February 28, 2018	Set

Release	Target S/W Release Date	Status
9.0.R1	September 26, 2018	Available
9.0.R2	November 28, 2018	Planned
9.0.R3	February 10, 2019	Candidate
9.0.R4	March 27, 2019	Set
9.0.R5	May 17, 2019	Set

7705 SAR R8.0.R1 (September 26, 2018)
Hardware Features
 • SDW3 MDA for 7705.SAR-8/-18

Note that hardware deliverables lag software delivery by 6-8 weeks.

Available
 Planned
 Candidate
 Set
 Hardware deliverable in this release

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