

**ENGINEERING REPORT**  
**PARTIAL PROOF OF PERFORMANCE**  
on  
**WKY(AM) – Oklahoma City, OK**  
for  
Richland Towers – Oklahoma City, LLC  
August, 2007

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**MUNN-REESE, INC.**  
Broadcast Engineering Consultants  
Coldwater, MI 49036

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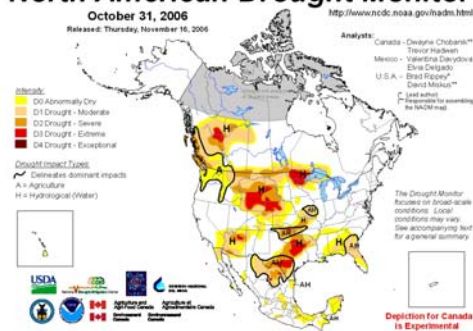
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# Discussion

The firm of Munn-Reese, Inc., was retained to prepare this report detailing a daytime non-directional partial proof of performance and nighttime directional partial proof of performance on AM Radio Station WKY(AM), Oklahoma City, OK. WKY(AM) operates on 930 kHz with 5.0 kW of daytime non-directional power and 5.0 kW of nighttime directional power using a three tower array. Construction of Antenna Structure Registration (ASR) tower 1253490 by Richland Towers – Oklahoma City, LLC, has taken place, in addition to the installation of multiple antennas and feedlines. ASR #1253490 resides within the §73.1692 3.2 km affected radius of the nighttime WKY(AM) array, but outside of the 0.8 km affected radius of the daytime WKY(AM) non-directional operation. However, out of an overabundance of caution, the data contained herein is being submitted to show the WKY(AM) daytime and nighttime operations remain essentially unchanged by the nearby tower construction.

Field strength measurements were conducted by Mr. Justin Asher, Engineer for Munn-Reese, Inc. Mr. Asher made his measurements using Potomac Instruments Field Intensity Meter, Model #FIM-41, S/N 844, calibrated March 28, 2006. Representatives of both WKY(AM) and ASR 1253490 were invited to ride along during the measurement project. Mr. Ken Boyd, staff engineer of WKY(AM) was witness to portions of the before measurement program while Mr. Ed Reid, contract engineer for Richland Towers was witness to portions of the after measurement program.

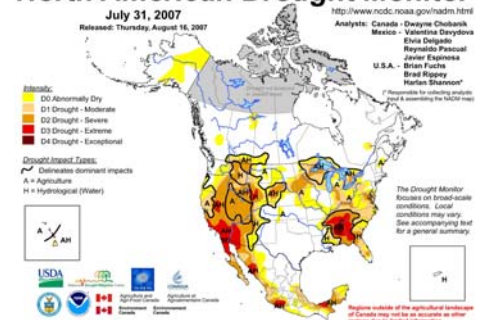
## North American Drought Monitor



Measurements were taken on the six (6) cardinal radials spaced 60.0° apart for daytime non-directional operation and the four (4) nighttime monitor point radials, meeting the requirements of 47 C.F.R. §73.154 of the FCC Rules. Field strength measurements were taken on the dates and at the times indicated in the respective Tabulations of Field Strength Measurements and included in **Exhibit(s) 1.1–2.2** for nighttime operation. The tabulation sheets show the distance from the transmitter site to each point in units of kilometers. The locations and point numbers were derived from topographical maps with the assistance of

GPS computer software. Before and after measurements were taken approximately ten months apart due to delays in tower construction. Initial before measurements were conducted in late October, 2006 with very dry conditions. Temperatures ranged from 75°F to 83°F. After measurements were conducted in late August, 2007 with temperatures ranging from 71°F to 93°F. While no precipitation was observed during the after measurement program, torrential rains were noted in the weeks preceding. NOAA records indicate 5.38 inches of rain fell between August 18-19 for the area. In addition, Inspection of U.S. Drought Monitor charts<sup>1</sup> taken closest to the measurement dates indicate before measurements were taken in severe to extreme drought conditions with central Oklahoma being delineated as a Dominant Impact Area. After measurements were conducted in normal or non-drought conditions. As a result, higher after measurements were anticipated due to the ground conductivity-ground moisture relationship.

## North American Drought Monitor



<sup>1</sup> The U.S. Drought Monitor is a joint effort between the USDA (United States Department of Agriculture), DOC (Department of Commerce), NOAA (National Oceanic and Atmospheric Administration) and the University of Nebraska – Lincoln.

## **Discussion**

**Exhibit 3.1** provides a summary of the field intensity measurements made on the daytime non-directional and nighttime directional array. As seen in the exhibit, all ratios indicate a uniform increase of approx 5% as expected due to the change in climate conditions was noted for both daytime and nighttime operations. No daytime radial varied by more than  $\pm 2.5\%$  from the mean log average for daytime radials or  $\pm 1.5\%$  from the mean log average for nighttime radials. These variances are well within the allowable 10% limits when taking into account climate factors.

In addition, all four MP values were noted to be with licensed maximum limits for both the before and after measurement programs as well as nighttime antenna monitor readings.

Therefore, through a combination of the uniform increase in field attributable to climatic changes and continued MP measurements within licensed values, the result obtained indicate the constructed tower has had a negligible effect on the WKY(AM) day and night operations.

## **CERTIFICATION OF ENGINEERS**

The firm of Munn-Reese, Inc., Broadcast Engineering Consultants, with offices at 385 Airport Drive, Coldwater, Michigan, has been retained for the purpose of preparing the technical data forming this report.

The data utilized in this report is based on field measurements made by the undersigned, or others under the supervision of the undersigned, on the dates and times indicated in the report.

The report has been prepared by properly trained electronics specialists under the direction of the undersigned whose qualifications are a matter of record before the Federal Communications Commission.

I declare under penalty of perjury that the contents of this report are true and accurate to the best of my knowledge and belief.

August 31, 2007

**MUNN-REESE, INC.**

By Wayne S. Reese  
Wayne S. Reese, President

By Justin W. Asher  
Justin W. Asher, Project Engineer

385 Airport Drive, PO Box 220  
Coldwater, Michigan 49036

Telephone: 517-278-7339

**MUNN-REESE, INC.**  
Broadcast Engineering Consultants  
Coldwater, MI 49036

### Tabulation of Daytime Radials 0.0°T, 60.0°T & 120.0°T

Call:	WKY		Frequency (kHz):			930	Power (kW):		5.00		Engineer: Justin Asher
				Bearing (°T):			120.0°				Meter Model: FIM-41      S/N: 844
											Calibration Date: March 28, 2006
Point #	Before Non-Directional			After Non-Directional			Distance	Direct		Log Ratio	
	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks		Other Notes
1	125.00	1043	10-25-06	125.00	1120	08-28-07	5.10	1.0000		0.0000	
2	115.00	1047	10-25-06	125.00	1115	08-28-07	5.60	1.0870		0.0834	
3	121.00	1051	10-25-06	135.00	1111	08-28-07	6.48	1.1157		0.1095	
4	91.00	1106	10-25-06	101.00	1105	08-28-07	7.42	1.1099		0.1043	
5	89.00	1110	10-25-06	92.00	0158	08-28-07	7.94	1.0337		0.0332	
6	69.00	1119	10-25-06	73.00	1048	08-28-07	10.60	1.0580		0.0564	
7	65.00	1125	10-25-06	70.00	1043	08-28-07	12.20	1.0769		0.0741	
8	57.00	1131	10-25-06	61.00	1038	08-28-07	13.50	1.0702		0.0678	
9	36.50	1138	10-25-06	38.50	1022	08-28-07	16.20	1.0548		0.0533	
							Arithmetic Ratio:	1.0673			
							Log Ratio:	1.0668			

### Tabulation of Daytime Radials 180.0°T, 240.0°T & 300.0°

Call:	WKY		Frequency (kHz): 930				Power (kW): 5.00			Engineer: Justin Asher	
				Bearing (°T): 180.0°						Meter Model: FIM-41      S/N: 844	
										Calibration Date: March 28, 2006	
Point	Before Non-Directional			After Non-Directional			Distance	Direct		Log	
#	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks	Ratio	Other Notes
1	285.00	1025	10-25-06	305.00	1539	08-29-07	2.77	1.0702		0.0678	
2	143.00	1014	10-25-06	150.00	1531	08-29-07	5.02	1.0490		0.0478	
3	115.00	1010	10-25-06	123.00	1553	08-29-07	6.00	1.0696		0.0673	
4	82.00	1005	10-25-06	87.00	1556	08-29-07	7.08	1.0610		0.0592	
5	78.00	0942	10-25-06	90.00	1618	08-29-07	10.70	1.1538		0.1431	
6	63.00	0931	10-25-06	67.00	1623	08-29-07	12.50	1.0635		0.0616	
7	51.00	0907	10-25-06	53.50	1635	08-29-07	14.40	1.0490		0.0479	
8	46.00	0900	10-25-06	47.00	1639	08-29-07	15.80	1.0217		0.0215	
9	37.00	0852	10-25-06	39.50	1648	08-29-07	17.60	1.0676		0.0654	
							Arithmetic Ratio:	1.0673			
							Log Ratio:	1.0667			

Call:	WKY			Frequency (kHz):		930	Power (kW):		5.00		Engineer: Justin Asher
				Bearing (°T):		240.0°					Meter Model: FIM-41      S/N: 844
											Calibration Date: March 28, 2006
Point #	Before Non-Directional			After Non-Directional			Distance	Direct		Log	
	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks	Ratio	Other Notes
1	250.00	1212	10-26-06	255.00	1731	08-28-07	2.99	1.0200		0.0198	
2	135.00	1226	10-26-06	148.00	1716	08-28-07	5.29	1.0963		0.0919	
3	99.00	1236	10-26-06	105.00	1701	08-28-07	7.01	1.0606		0.0588	
4	120.00	1243	10-26-06	119.00	1657	08-28-07	7.84	0.9917		-0.0084	
5	59.00	1253	10-26-06	63.00	1647	08-28-07	10.40	1.0678		0.0656	
6	64.00	1636	10-25-06	63.00	1642	08-28-07	12.10	0.9844		-0.0157	
7	47.50	1630	10-25-06	52.50	1635	08-28-07	13.40	1.1053		0.1001	
8	39.00	1618	10-25-06	39.50	1618	08-28-07	15.30	1.0128		0.0127	
9	39.00	1623	10-25-06	43.00	1625	08-28-07	16.40	1.1026		0.0976	
							Arithmetic Ratio:	1.0490			
							Log Ratio:	1.0481			

Call:	WKY		Frequency (kHz):			930	Power (kW):		5.00		Engineer: Justin Asher
				Bearing (°T):		300.0°					Meter Model: FIM-41      S/N: 844
											Calibration Date: March 28, 2006
Point	Before Non-Directional			After Non-Directional			Distance	Direct		Log	
#	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks	Ratio	Other Notes
1	242.00	1509	10-25-06	255.00	1455	08-28-07	3.03	1.0537		0.0523	
2	175.00	1514	10-25-06	180.00	1459	08-28-07	4.01	1.0286		0.0282	
3	134.00	1524	10-25-06	145.00	1514	08-28-07	6.45	1.0821		0.0789	
4	119.00	1534	10-25-06	129.00	1528	08-28-07	8.46	1.0840		0.0807	
5	105.00	1547	10-25-06	105.00	1539	08-28-07	10.90	1.0000		0.0000	
6	90.00	1550	10-25-06	90.00	1543	08-28-07	11.80	1.0000		0.0000	
7	72.00	1553	10-25-06	75.00	1549	08-28-07	13.70	1.0417		0.0408	
8	71.00	1556	10-25-06	76.00	1554	08-28-07	15.50	1.0704		0.0681	
9	42.50	1559	10-25-06	43.50	1557	08-28-07	17.00	1.0235		0.0233	
							Arithmetic Ratio:	1.0427			
							Log Ratio:	1.0422			

## Exhibit 2.1

### Tabulation of Nighttime Radials 44.0°T & 106.0°T

<b>Call:</b>	<b>WKY</b>			<b>Frequency (kHz): 930</b>			<b>Power (kW): 5.00</b>				Engineer: Justin Asher
				<b>Bearing (°T): 44.0°</b>							Meter Model: FIM-41 S/N: 844
											Calibration Date: March 28, 2006
<b>Point</b>	<b>Before</b>	<b>Directional</b>		<b>After</b>	<b>Directional</b>		<b>Distance</b>	<b>Direct</b>		<b>Log</b>	
<b>#</b>	<b>mV/m</b>	<b>Time</b>	<b>Date</b>	<b>mV/m</b>	<b>Time</b>	<b>Date</b>	<b>km</b>	<b>Ratio</b>	<b>Remarks</b>	<b>Ratio</b>	<b>Other Notes</b>
1	76.00	1343	10-24-06	85.00	0815	08-29-07	3.91	1.1184	MP	0.1119	
2	76.00	1347	10-24-06	80.00	0828	08-29-07	5.02	1.0526		0.0513	
3	53.00	1350	10-24-06	54.50	0832	08-29-07	6.17	1.0283		0.0279	
4	47.50	1354	10-24-06	48.50	0836	08-29-07	7.33	1.0211		0.0208	
5	22.50	1402	10-24-06	22.00	0840	08-29-07	8.44	0.9778		-0.0225	
6	19.50	1406	10-24-06	21.90	0845	08-29-07	9.53	1.1231		0.1161	
7	17.50	1409	10-24-06	18.80	0850	08-29-07	10.80	1.0743		0.0717	
8	12.80	1432	10-24-06	14.50	0906	08-29-07	15.40	1.1328		0.1247	
9	10.80	1434	10-24-06	10.50	0909	08-29-07	16.30	0.9722		-0.0282	
							<b>Arithmetic Ratio:</b>		<b>1.0556</b>		
							<b>Log Ratio:</b>		<b>1.0540</b>		

<b>Call:</b>	<b>WKY</b>			<b>Frequency (kHz): 930</b>			<b>Power (kW): 5.00</b>				Engineer: Justin Asher
				<b>Bearing (°T): 106.0°</b>							Meter Model: FIM-41 S/N: 844
											Calibration Date: March 28, 2006
<b>Point</b>	<b>Before</b>	<b>Directional</b>		<b>After</b>	<b>Directional</b>		<b>Distance</b>	<b>Direct</b>		<b>Log</b>	
<b>#</b>	<b>mV/m</b>	<b>Time</b>	<b>Date</b>	<b>mV/m</b>	<b>Time</b>	<b>Date</b>	<b>km</b>	<b>Ratio</b>	<b>Remarks</b>	<b>Ratio</b>	<b>Other Notes</b>
1	120.00	1551	10-24-06	130.00	0930	08-29-07	2.81	1.0833	MP	0.0800	
2	26.50	1557	10-24-06	27.50	0938	08-29-07	4.41	1.0377		0.0370	
3	52.00	1601	10-24-06	52.00	0943	08-29-07	6.20	1.0000		0.0000	
4	12.10	1611	10-24-06	12.80	0957	08-29-07	8.67	1.0579		0.0562	
5	16.50	1615	10-24-06	16.50	1001	08-29-07	9.53	1.0000		0.0000	
6	13.20	1620	10-24-06	14.30	1008	08-29-07	11.20	1.0833		0.0800	
7	10.60	1627	10-24-06	11.50	1013	08-29-07	12.90	1.0849		0.0815	
8	11.90	1632	10-24-06	13.10	1018	08-29-07	14.50	1.1008		0.0961	
9	7.90	1636	10-24-06	8.30	1025	08-29-07	15.90	1.0506		0.0494	
							<b>Arithmetic Ratio:</b>		<b>1.0554</b>		
							<b>Log Ratio:</b>		<b>1.0548</b>		

**Munn-Reese, Inc.**

Broadcast Engineering Consultants

Coldwater, MI 49036

## Exhibit 2.2

### Tabulation of Nighttime Radials 271.0°T & 307.0°T

Call:	WKY			Frequency (kHz):		930	Power (kW):		5.00		Engineer: Justin Asher	
				Bearing (°T):		271.0°					Meter Model: FIM-41                      S/N: 844	
											Calibration Date: March 28, 2006	
Point	Before	Directional		After	Directional		Distance	Direct		Log		
#	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks	Ratio	Other Notes	
1	210.00	1329	10-24-06	210.00	1344	08-29-07	2.52	1.0000	MP	0.0000		
2	148.00	1325	10-24-06	159.00	1339	08-29-07	3.23	1.0743		0.0717		
3	138.00	1323	10-24-06	140.00	1336	08-29-07	3.72	1.0145		0.0144		
4	100.00	1231	10-24-06	108.00	1329	08-29-07	5.33	1.0800		0.0770		
5	92.00	1239	10-24-06	95.00	1323	08-29-07	6.00	1.0326		0.0321		
6	53.00	1144	10-24-06	56.00	1303	08-29-07	11.80	1.0566		0.0551		
7	44.00	1132	10-24-06	45.00	1233	08-29-07	13.40	1.0227		0.0225		
8	41.50	1127	10-24-06	42.50	1229	08-29-07	15.00	1.0241		0.0238		
9	27.50	1123	10-24-06	27.50	1225	08-29-07	16.60	1.0000		0.0000		
							Arithmetic Ratio:		1.0339			
							Log Ratio:		1.0335			

Call:	WKY			Frequency (kHz):		930	Power (kW):		5.00		Engineer: Justin Asher	
				Bearing (°T):		307.0°					Meter Model: FIM-41                      S/N: 844	
											Calibration Date: March 28, 2006	
Point	Before	Directional		After	Directional		Distance	Direct		Log		
#	mV/m	Time	Date	mV/m	Time	Date	km	Ratio	Remarks	Ratio	Other Notes	
1	148.00	1001	10-24-06	160.00	1059	08-29-07	2.65	1.0811	MP	0.0780		
2	150.00	1006	10-24-06	154.00	1109	08-29-07	3.47	1.0267		0.0263		
3	132.00	1012	10-24-06	138.00	1115	08-29-07	5.02	1.0455		0.0445		
4	111.00	1018	10-24-06	119.00	1123	08-29-07	6.09	1.0721		0.0696		
5	91.00	1022	10-24-06	92.00	1127	08-29-07	7.02	1.0110		0.0109		
6	74.00	1030	10-24-06	76.00	1132	08-29-07	8.11	1.0270		0.0267		
8	31.50	1044	10-24-06	33.50	1146	08-29-07	11.40	1.0635		0.0616		
9	33.50	1048	10-24-06	36.00	1150	08-29-07	12.80	1.0746		0.0720		
11	29.50	1102	10-24-06	32.00	1157	08-29-07	14.80	1.0847		0.0813		
							Arithmetic Ratio:		1.0540			
							Log Ratio:		1.0537			

**Munn-Reese, Inc.**

Broadcast Engineering Consultants

Coldwater, MI 49036



## Exhibit 3.1

### Tabulation of Ratios

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#### Daytime Operation:

Radial	Arithmetic Ratio	Log Ratio
0.0°T	1.0301	1.0295
60.0°T	1.0612	1.0597
120.0°T	1.0673	1.0668
180.0°T	1.0673	1.0667
240.0°T	1.0490	1.0481
300.0°T	1.0427	1.0422
<b>Average:</b>	<b>1.0529</b>	<b>1.0522</b>

#### Nighttime Operation:

Radial	Arithmetic Ratio	Log Ratio
44.0°T	1.0556	1.0540
106.0°T	1.0554	1.0548
271.0°T	1.0339	1.0335
307.0°T	1.0540	1.0537
<b>Average:</b>	<b>1.0497</b>	<b>1.0490</b>

Radial	MP Limit (mV/m)	Before MP Value (mV/m)	After MP Value (mV/m)
44.0°T	86.6	76.0	85.0
106.0°T	151.1	120.0	130.0
271.0°T	211.0	210.0	210.0
307.0°T	162.1	148.0	160.0

Tower	Before Field	Before Phase	After Field	After Phase
1	1.000	0.0°	1.000	0.0°
2	0.604	+21.9°	0.612	+21.7°
3	0.617	-126.3°	0.623	-125.7°