

FREQUENCY COORDINATION AND INTERFERENCE  
ANALYSIS REPORT

PREPARED FOR

HDNet, LLC  
DENVER, COLORADO

SATELLITE EARTH STATION

PREPARED BY  
COMSEARCH  
19700 JANELIA FARM BOULEVARD  
ASHBURN, VIRGINIA 20147  
JULY 15, 2002

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1. CONCLUSIONS

AN INTERFERENCE STUDY CONSIDERING ALL EXISTING, PROPOSED AND PRIOR COORDINATED MICROWAVE FACILITIES WITHIN THE COORDINATION CONTOURS OF THE PROPOSED EARTH STATION DEMONSTRATES THAT THIS SITE WILL OPERATE SATISFACTORILY WITH THE COMMON CARRIER MICROWAVE ENVIRONMENT. FURTHER, THERE WILL BE NO RESTRICTIONS OF ITS OPERATION DUE TO INTERFERENCE CONSIDERATIONS.

2. SUMMARY OF RESULTS

A NUMBER OF GREAT CIRCLE INTERFERENCE CASES WERE IDENTIFIED DURING THE INTERFERENCE STUDY OF THE PROPOSED EARTH STATION. EACH OF THE CASES WHICH EXCEEDED THE INTERFERENCE OBJECTIVE ON A LINE-OF-SIGHT BASIS WAS PROFILED AND THE PROPAGATION LOSSES ESTIMATED USING NBS TN101 (REVISED) TECHNIQUES. THE LOSSES WERE FOUND TO BE SUFFICIENT TO REDUCE THE SIGNAL LEVELS TO ACCEPTABLE MAGNITUDES IN EVERY CASE.

THE FOLLOWING COMPANIES REPORTED POTENTIAL GREAT CIRCLE INTERFERENCE CONFLICTS WHICH DID NOT MEET THE OBJECTIVES ON A LINE-OF-SIGHT BASIS. WHEN OVER-THE-HORIZON LOSSES ARE CONSIDERED ON THE INTERFERING PATHS, SUFFICIENT BLOCKAGE EXISTS TO NEGATE HARMFUL INTERFERENCE FROM OCCURRING WITH THE PROPOSED TRANSMIT AND RECEIVE EARTH STATION.

COMPANY

QWEST COMMUNICATIONS INTERNATIONAL, INC  
BACKLINK, LLC (DEBTOR-IN-POSSESSION)  
AT&T WIRELESS SERVICES OF COLORADO, LLC

NO OTHER CARRIERS REPORTED POTENTIAL INTERFERENCE CASES.

3. SUPPLEMENTAL SHOWING  
RE: PART 25.203(C)

PURSUANT TO PART 25.203(C) OF THE FCC RULES AND REGULATIONS,  
THE SATELLITE EARTH STATION PROPOSED IN THIS APPLICATION  
WAS COORDINATED BY COMSEARCH USING COMPUTER TECHNIQUES  
AND IN ACCORDANCE WITH PART 25 OF THE FCC RULES AND  
REGULATIONS.

COORDINATION DATA FOR THIS EARTH STATION WAS SENT TO THE  
BELOW LISTED CARRIERS WITH A LETTER DATED MAY 24, 2002.

AT&T COMMUNICATIONS OF MOUNTAIN STATES  
AT&T CORP.  
AT&T Wireless Services of Colorado, LLC  
BACKLINK LLC (debtor-in-possession)  
BASIN ELECTRIC POWER COOPERATIVE  
BOULDER REGIONAL COMMUNICATIONS CENTER  
COLORADO INTERSTATE GAS COMPANY  
COLORADO SPRINGS UTILITIES-BIS TELECOMMU  
COLORADO STATE TELECOMMUNICATIONS SVCS  
CORBAN COMMUNICATIONS INC.  
FONES WEST DIGITAL SYSTEMS INC.  
GREAT PLAINS CABLE TELEVISION  
LARIMER COUNTY SHERIFF'S DEPARTMENT  
LB Tower Company LLC  
MCI WORLDCOM NETWORK SERVICES INC  
NE COLORADO CELLULAR INC  
PATHNET, INC. - DEBTOR IN POSSESSION  
PLATTE RIVER POWER AUTHORITY  
QWEST COMMUNICATIONS INTERNATIONAL INC.  
SMOKY HILL CELLULAR OF COLORADO LP  
SPRINT COMMUNICATIONS CO., LP  
THE BURLINGTON NORTHERN AND SANTA FE  
TRI STATE GENERATION & TRANSMISSION ASSN  
UA CABLE OF CENTRAL WYOMING - CASPER  
VERIZON WIRELESS (VAW) LLC  
VOICESTREAM PCS II LICENSE CORPORATION  
WWC HOLDING CO., INC.  
Xcel Energy Services Inc

4. EARTH STATION COORDINATION DATA

THIS SECTION PRESENTS THE DATA PERTINENT TO FREQUENCY  
COORDINATION OF THE PROPOSED EARTH STATION WHICH WAS  
CIRCULATED TO ALL COMMON CARRIERS WITHIN ITS COOR-  
DINATION CONTOURS.

SATELLITE EARTH STATION  
FREQUENCY COORDINATION DATA  
05/24/2002

Company	HDNET, LLC	
Earth Station Name, State	DENVER, CO	
Latitude (DMS) (NAD83)	39 45 7.6 N	
Longitude (DMS) (NAD83)	104 53 28.5 W	
Ground Elevation AMSL (Ft/m)	5315.0 / 1619.94	
Antenna Centerline AGL (Ft/m)	20.0 / 6.10	
Receive Antenna Type:	VERTEX COMMUNICATIONS	
	9.3 KPC	
4.0 GHz Gain (dBi) / Diameter (m)	50.1 /	9.3
3 dB / 15 dB Half Beamwidth	0.26 /	0.58
Transmit Antenna Type:	VERTEX COMMUNICATIONS	
	9.3 KPC	
6.0 GHz Gain (dBi) / Diameter (m)	53.9 /	9.3
3 dB / 15 dB Half Beamwidth	0.17 /	0.36
Operating Mode	TRANSMIT AND RECEIVE	
Modulation	DIGITAL	
Emission / Receive Band (MHz)	28M8G7W / 3700.0000 - 4200.0000	
Emission / Transmit Band (MHz)	28M8G7W / 5925.0000 - 6425.0000	
Max. Available RF Power (dBW)/4 kHz	-18.60	
(dBW)/MHz	5.40	
Max. EIRP (dBW)/4 kHz	35.30	
(dBW)/MHz	59.30	
Max permissible Interference Power		
4.0 GHz, 20% (dBW/1 MHz)	-154.0	
4.0 GHz, 0.0100% (dBW/1 MHz)	-144.0	
6.0 GHz, 20% (dBW/4 kHz)	-154.0	
6.0 GHz, 0.0025% (dBW/4 kHz)	-131.0	
Range of Satellite Arc (Geostationary)		
Degrees Longitude	60.0 W / 143.0 W	
Azimuth Range (Min/Max)	122.7 / 230.8	
Corresponding Elevation Angles	25.1 / 29.7	
Radio Climate	A	
Rain Zone	2	
Max Great Circle Coordination Distance (Mi/Km)		
4.0 GHz	188.9 /	304.0
6.0 GHz	81.9 /	131.7
Precipitation Scatter Contour Radius (Mi/Km)		
4.0 GHz	306.4 /	493.1
6.0 GHz	62.1 /	100.0

Table of Earth Station Coordination Values  
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 Antenna Centerline (Ft/m) 20.0 / 6.10 AGL  
 Antenna Model VERTEX COMMUNICATIONS 9.3 KPC  
 Objectives: Receive -154.0 (dBW /1 MHz)  
 Transmit -154.0 (dBW /4 kHz) TX Power -18.6 (dBW/4 kHz)

Azimuth (Deg)	Horizon Elevation Angle (Deg)	Antenna Disc. Angle (Deg)	4.0 GHz		6.0 GHz	
			Antenna Gain (dBi)	Coordination Distance (Km)	Antenna Gain (dBi)	Coordination Distance (Km)
0	0.00	119.28	-10.00	272.8	-10.00	120.6
5	0.00	114.89	-10.00	272.8	-10.00	120.6
10	0.00	110.45	-10.00	272.8	-10.00	120.6
15	0.00	105.98	-10.00	272.8	-10.00	120.6
20	0.00	101.48	-10.00	272.8	-10.00	120.6
25	0.00	96.97	-10.00	272.8	-10.00	120.6
30	0.00	92.44	-10.00	272.8	-10.00	120.6
35	0.00	87.92	-10.00	272.8	-10.00	120.6
40	0.00	83.39	-10.00	272.8	-10.00	120.6
45	0.00	78.88	-10.00	272.8	-10.00	120.6
50	0.00	74.38	-10.00	272.8	-10.00	120.6
55	0.00	69.91	-10.00	272.8	-10.00	120.6
60	0.00	65.47	-10.00	272.8	-10.00	120.6
65	0.00	61.07	-10.00	272.8	-10.00	120.6
70	0.00	56.73	-10.00	272.8	-10.00	120.6
75	0.00	52.46	-10.00	272.8	-10.00	120.6
80	0.00	48.29	-10.00	272.8	-10.00	120.6
85	0.00	44.25	-9.15	278.0	-9.15	122.9
90	0.00	40.37	-8.15	284.3	-8.15	125.5
95	0.22	36.58	-7.08	288.2	-7.08	126.4
100	0.20	33.22	-6.03	297.6	-6.03	130.8
105	0.23	30.22	-5.01	301.4	-5.01	131.6
110	0.26	27.75	-4.08	304.0	-4.08	131.7
115	0.31	25.91	-3.34	301.9	-3.34	129.1
120	0.36	24.91	-2.91	298.5	-2.91	126.2
125	0.39	24.84	-2.88	294.8	-2.88	123.8
130	0.43	25.70	-3.25	288.0	-3.25	120.1
135	0.54	27.32	-3.91	272.2	-3.91	110.7
140	0.56	29.74	-4.83	265.0	-4.83	107.4
145	0.53	32.60	-5.83	260.9	-5.83	106.2
150	0.46	35.31	-6.70	262.1	-6.70	108.5
155	0.43	37.69	-7.41	260.8	-7.41	108.7
160	0.43	39.72	-7.98	257.6	-7.98	107.4
165	0.43	41.37	-8.42	255.0	-8.42	106.2
170	0.40	42.61	-8.74	256.8	-8.74	108.0
175	0.41	43.35	-8.92	254.9	-8.92	106.9
180	0.43	43.57	-8.98	251.6	-8.98	104.7



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Azimuth (Deg)	Horizon Elevation Angle (Deg)	Antenna Disc. Angle (Deg)	4.0 GHz		6.0 GHz	
			Antenna Gain (dBi)	Coordination Distance (Km)	Antenna Gain (dBi)	Coordination Distance (Km)
185	0.44	43.31	-8.92	250.8	-8.92	104.0
190	0.32	42.68	-8.76	265.4	-8.76	113.9
195	0.40	41.40	-8.43	259.0	-8.43	109.0
200	0.38	39.77	-7.99	263.6	-7.99	111.5
205	0.37	37.75	-7.42	267.7	-7.42	113.4
210	0.49	35.28	-6.69	258.5	-6.69	106.0
215	0.41	32.92	-5.94	272.3	-5.94	114.2
220	0.46	30.98	-5.28	270.4	-5.28	111.8
225	0.43	29.77	-4.84	277.4	-4.84	115.8
230	0.36	29.32	-4.68	286.5	-4.68	121.5
235	0.35	29.59	-4.78	287.1	-4.78	122.1
240	0.36	30.60	-5.14	283.8	-5.14	120.5
245	0.32	32.33	-5.74	285.3	-5.74	122.4
250	0.00	34.86	-6.56	294.6	-6.56	129.7
255	0.00	37.58	-7.37	289.3	-7.37	127.5
260	0.00	40.67	-8.23	283.8	-8.23	125.3
265	0.00	44.05	-9.10	278.3	-9.10	123.0
270	0.00	47.67	-9.96	273.1	-9.96	120.8
275	0.00	51.47	-10.00	272.8	-10.00	120.6
280	0.00	55.40	-10.00	272.8	-10.00	120.6
285	0.00	59.45	-10.00	272.8	-10.00	120.6
290	0.00	63.58	-10.00	272.8	-10.00	120.6
295	0.00	67.77	-10.00	272.8	-10.00	120.6
300	0.00	72.02	-10.00	272.8	-10.00	120.6
305	0.00	76.31	-10.00	272.8	-10.00	120.6
310	0.00	80.62	-10.00	272.8	-10.00	120.6
315	0.00	84.96	-10.00	272.8	-10.00	120.6
320	0.00	89.30	-10.00	272.8	-10.00	120.6
325	0.00	93.64	-10.00	272.8	-10.00	120.6
330	0.00	97.98	-10.00	272.8	-10.00	120.6
335	0.00	102.30	-10.00	272.8	-10.00	120.6
340	0.00	106.60	-10.00	272.8	-10.00	120.6
345	0.00	110.86	-10.00	272.8	-10.00	120.6
350	0.00	115.07	-10.00	272.8	-10.00	120.6
355	0.00	119.23	-10.00	272.8	-10.00	120.6

5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED  
PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY  
COORDINATION DATA CONTAINED IN THIS APPLICATION,  
THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC  
RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED  
OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED  
WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND  
CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

*Jeffrey E. Cowles*

BY: \_\_\_\_\_

JEFFREY E. COWLES  
SENIOR FREQUENCY COORDINATOR  
COMSEARCH  
19700 JANELIA FARM BOULEVARD  
ASHBURN, VIRGINIA 20147

DATE: July 15, 2002

