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EX PARTE OR LATE FILED

October 17, 2001

RECEIVED

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA HAND DELIVERY **EX PARTE**

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Ex Parte Communication in ET Docket No. 98-206; RM-9147; RM-9245; Applications of Broadwave USA et al., PDC Broadband Corporation, and Satellite Receivers, Ltd., to provide a fixed service in the 12.2-12.7 GHz Band; Requests of Broadwave USA et al. (DA 99-494), PDC Broadband Corporation (DA 00-1841), and Satellite Receivers, Ltd. (DA 00-2134) for Waiver of Part 101 Rules.

Dear Ms. Salas,

On October 16, 2001, Sophia Collier and Antoinette Cook Bush of Northpoint Technology, Ltd. ("Northpoint") met with Julius Knapp of the Commission's Office of Engineering and Technology. During the meeting Northpoint discussed various technical issues relating to terrestrial/satellite sharing of the 12.2-12.7 GHz frequency band, as reflected in the attached handout, which was used at the meeting.

Also on October 16, 2001, the same Northpoint representatives met with Monica Desai, Legal Advisor to Commissioner Martin. At this meeting, Northpoint likewise discussed various technical issues but focused on the issue of on-site mitigation. Northpoint first noted that, although the DBS industry has been pushing for a 2.86 % increase-in-unavailability criterion for determining a mitigation zone, the industry did not actually use the 2.86% zone when it conducted its test of Northpoint's technology. Instead, the DBS representatives took readings only in the smaller mitigation zone proposed by Northpoint. Moreover, as the Commission has recognized, the DBS industry was not able to demonstrate that any existing DBS customer in either the DBS-proposed zone or the Northpoint-proposed zone received harmful interference during the DBS tests. *See* First Report and Order and Further Notice of Proposed Rulemaking

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¶ 215, ET Docket No. 98-206, FCC 00-418 (FCC rel. Dec. 8, 2000). Northpoint used page 27 of the attached handout to illustrate these points.

Northpoint also observed that the DBS industry's proposed 2.86% criterion unnecessarily increases the size of the mitigation zone and thus increases the number of DBS customers who could potentially be candidates for on-site mitigation. Correctly sizing the zone would, by contrast, reduce the number of customers who could be considered for on-site mitigation, thus reducing the potential for conflict between terrestrial and DBS operators.

Northpoint noted that it anticipates visiting DBS customers' homes only rarely, if ever, and only after off-site measures had been implemented. Northpoint outlined the following steps it would take to avoid visiting DBS customers' homes when designing and building each cell:

1. Select sites that minimize the number of homes within the mitigation zone;

2. Use engineering techniques of the Northpoint system (e.g., tilting the antenna, increasing the antenna height, and beam forming) to minimize the number of homes in the mitigation zone;

3. Take measurements at a variety of locations within the cell prior to commencing operations to ensure compliance with the FCC requirements;

4. If, after commencing operations Northpoint receives a DBS customer complaint, then Northpoint would go to the customer's home and take readings outside that home to determine whether Northpoint is in compliance with the FCC power requirements;

5. If the measurements show that Northpoint is not in compliance, then Northpoint would first go back to its transmitter and try to remedy the problem by making adjustments there;

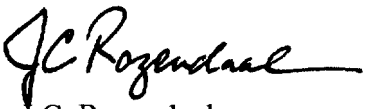
6. Only in the rare instance where Northpoint could not fix the problem at its transmitter would it ask the customer for permission to have access to his or her dish to resolve the problem at Northpoint's expense.

7. If the customer refused, then it would be up to Northpoint to avoid harmful interference through off-site measures, up to and including relocation of the terrestrial transmitter, if necessary.

Northpoint concluded by noting that during all of the testing of Northpoint's system by Northpoint and the DBS operators, neither Northpoint nor the DBS operators needed to visit any DBS customers' homes to perform mitigation.

Eighteen copies of this letter are enclosed – two for inclusion in each of the above-referenced files. Please contact me if you have any questions.

Yours sincerely,



J.C. Rozendaal
Counsel for Northpoint Technology, Ltd.

cc: Julius Knapp, Office of Engineering and Technology
Monica Desai, Office of Commissioner Martin
Peter Tenhula, Office of the Chairman
Bryan Tramont, Office of Commissioner Abernathy
Paul Margie, Office of Commissioner Copps
Thomas Sugrue, Chief, Wireless Telecommunications Bureau

Topics in Today's Briefing

- Spectrum sharing - general technical overview
- Appropriate interference criterion for sharing between DBS and Northpoint
  - Northpoint proposal for EPFD based on 20 dB C/I
    - Fully protects DBS and prevents harmful interference
    - Precedents for this proposal
  - DBS proposal (2.86%)
    - Severely constrains Northpoint
    - No corresponding benefit to public

What is Harmful Interference in the Digital Age?

- FCC rules define harmful interference as “serious degradation” or “repeated interruption” to a radiocommunication service. (S 2.1)
- Analog television services - static or snow on the screen.
- Digital technologies are more robust than analog - provide a consistent, high quality user experience over a wider range of operating values.
- Harmful interference to digital services – abrupt failure with a very brief (seconds only) transition time between perfect reception and outage.

Carrier to Interference Ratio (C/I)

- Interference - the signal of one service is sufficiently strong that it overpowers the other signal and causes an outage.
- The relative strength of one signal to another is calculated as a ratio of "Carrier to Interference" ("C/I") using a logarithmic scale called decibels ("dB").
- DBS - outage occurs at C/I ratios between 3.5 – 6.5 dB.
- Northpoint proposes it provide all DBS customers with a minimum 20 dB of protection.
- DBS argues that Northpoint be required to provide a minimum of approximately 28 dB of protection.

The Decibel Scale (dB)	
dB	Ratio
0	1 to 1
3	1 to 2
7	1 to 5
10	1 to 10
17	1 to 50
20	1 to 100
28	1 to 600
30	1 to 1,000
40	1 to 10,000

A scale commonly used to measure the ratio of one signal power to another

All Parties' Technical Filings Agree Northpoint Would Never Cause An Outage in Clear Air

- Heavy rain storms clouds, lightning and large rain drops can cause DBS outages in some cases.
- DBS contends that Northpoint could "increase unavailability" by adding incrementally to the duration of rain outages.

DBS Stated Availability and Unavailability in Washington D.C. (per year)					
Available	Unavailable	Total hours in a year	Total hours unavailable	Annual average television hrs (Nielsen)*	Annual television hours unavailable
99.95%	0.05%	8,768	4.4	2,557	1.28

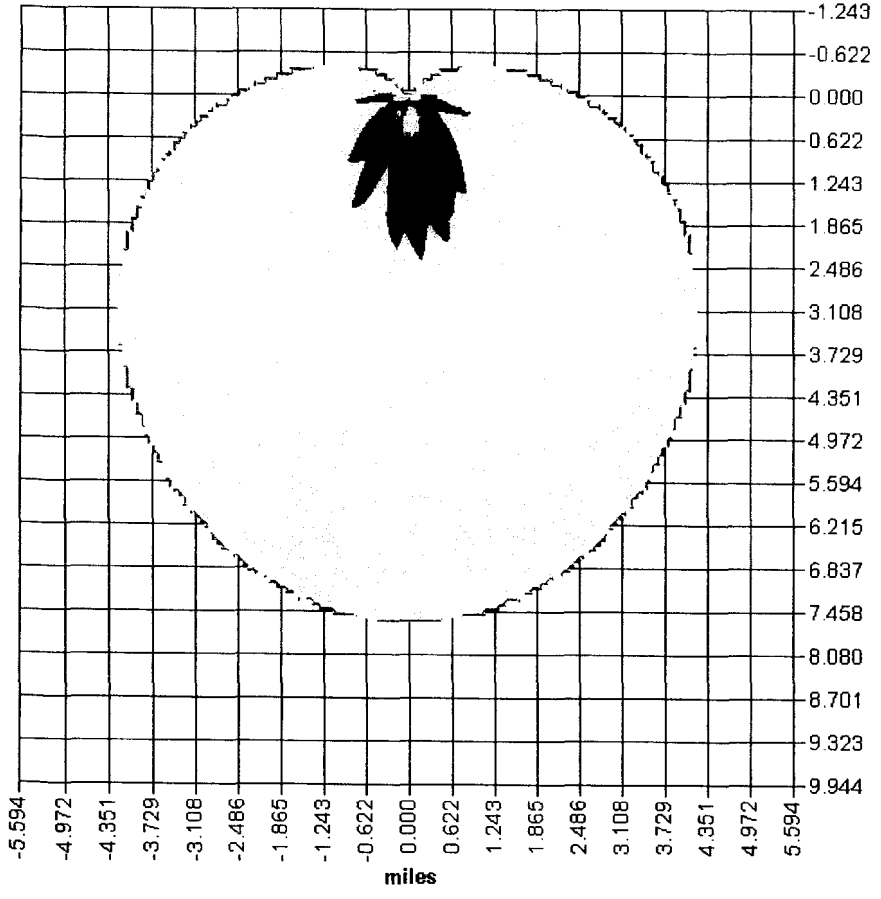
- Availability is a statistical estimate only - based on input assumptions.

* Nielsen studies have shown television is on in the home 7 out of 24 hours (29%)

Contours Define Mitigation Regions in Spectrum Sharing Studies

- "Contour" diagrams plot the degree of overlap between signals and highlight any "mitigation zones" – areas where the overlap exceeds a targeted C/I ratio.
- Contours diagrams account for:
  - Specific system characteristics (transmit and receive antennas etc.)
  - "Free space loss" - the fact that when a radio signal doubles its distance its intensity is quartered
    - Signals near the transmitter are dramatically higher than signals even 100 yards away.
- When spectrum is shared, signals emanate from several sources, each with a different strength due to differences in original power and distance from its source.
- Contour maps make it easy to visualize and understand these factors.

Example of Contour Plot



0.0-2.0	2.0-4.0
4.0-6.0	6.0-8.0
8.0-10.0	10.0-12.0
12.0-14.0	14.0-16.0
16.0-18.0	18.0-20.0
20.0-22.0	22.0-24.0
24.0-26.0	26.0-28.0
28.0-30.0	30.0-32.0
32.0-34.0	34.0-36.0
36.0-38.0	38.0-40.0
40.0-42.0	42.0-44.0
44.0-46.0	46.0-48.0

C/I Contours in Washington, DC
Satellites: 119W, 110W, 101W, 61.5W

Northpoint Parameters
EIRP = -17.5 dBW
Bearing = 180 Degrees
Tilt = 0 Degrees
HAAT = 200 ft
Antenna Pattern = 10

Contour -- Area
20 dB -- 0.2 sq mi
7 dB -- 0 sq mi

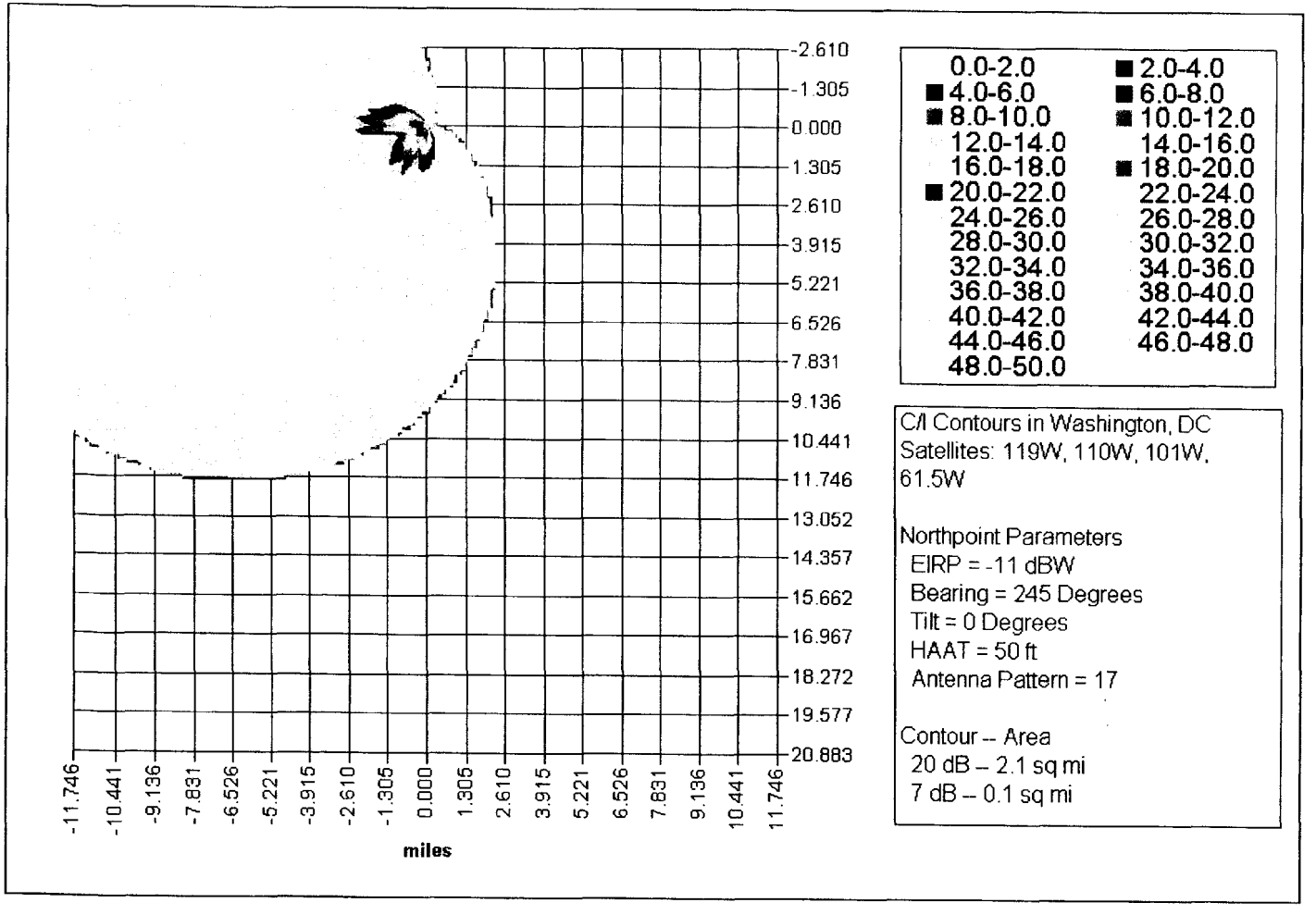
Special Issues In Satellite and Terrestrial Sharing Contours

- Satellite signals - fairly uniform across a service area.
- Terrestrial signals are much closer to their source transmitter and therefore show a much greater degree of variability across the service area.
- When satellite and terrestrial signals are plotted together, the highest terrestrial power will be in the immediate vicinity of the transmitter.
- Summary of areas of agreement:
  - No interference potential during clear air – potential for concern is on rain days only (increased unavailability).
  - Interference concern is confined to a contour around Northpoint transmitter.

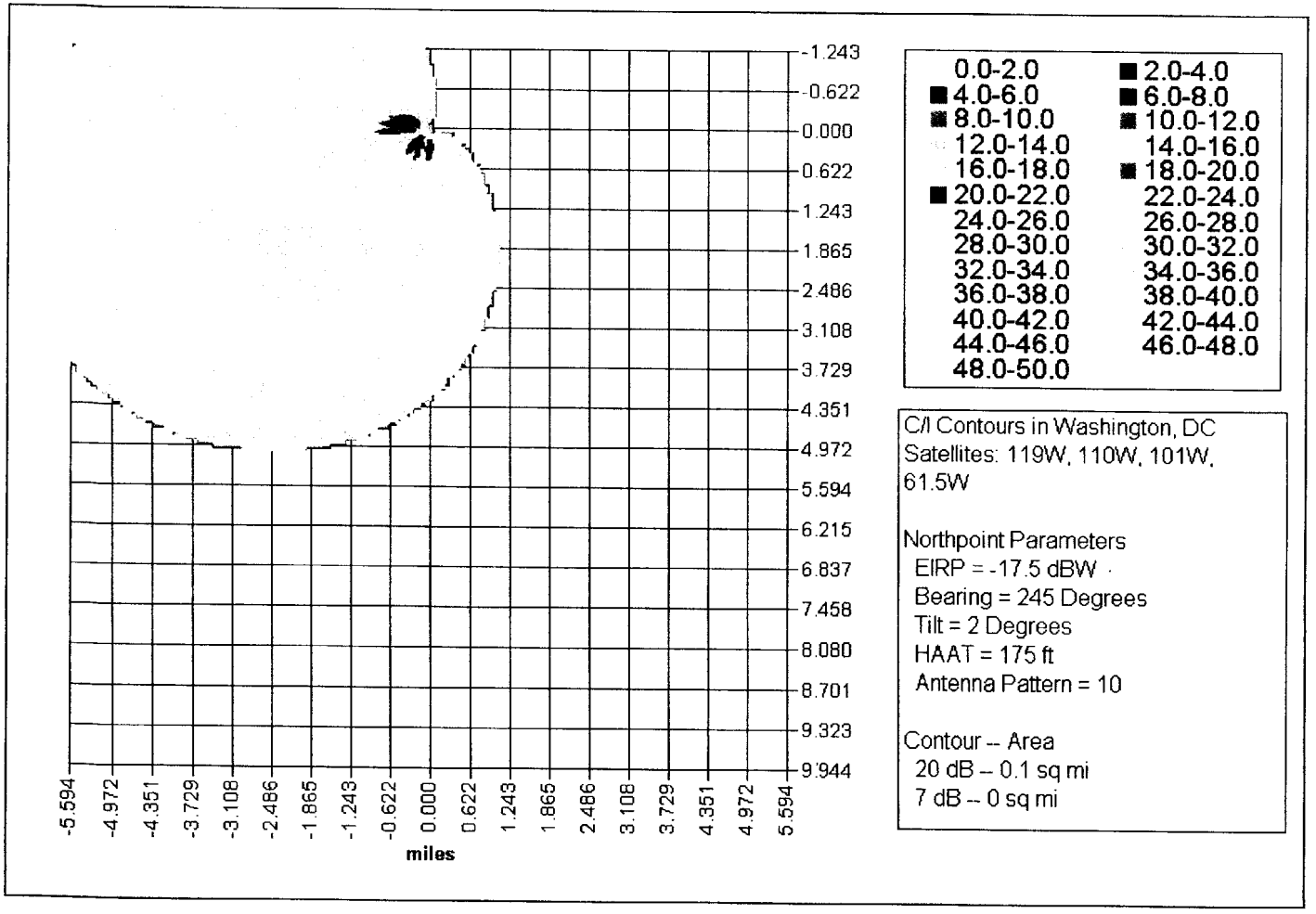
Contour Studies

- Contour studies are used as a design tool when individual cells are planned for an actual deployment.
- Contour studies can also provide a vivid demonstration of how Northpoint technology works:
  - Wide variety of options to design cells.
    - Achieve a substantial, reliable service area for Northpoint customers.
    - Prevent harmful interference to DBS.
- Demonstration – basic cases.

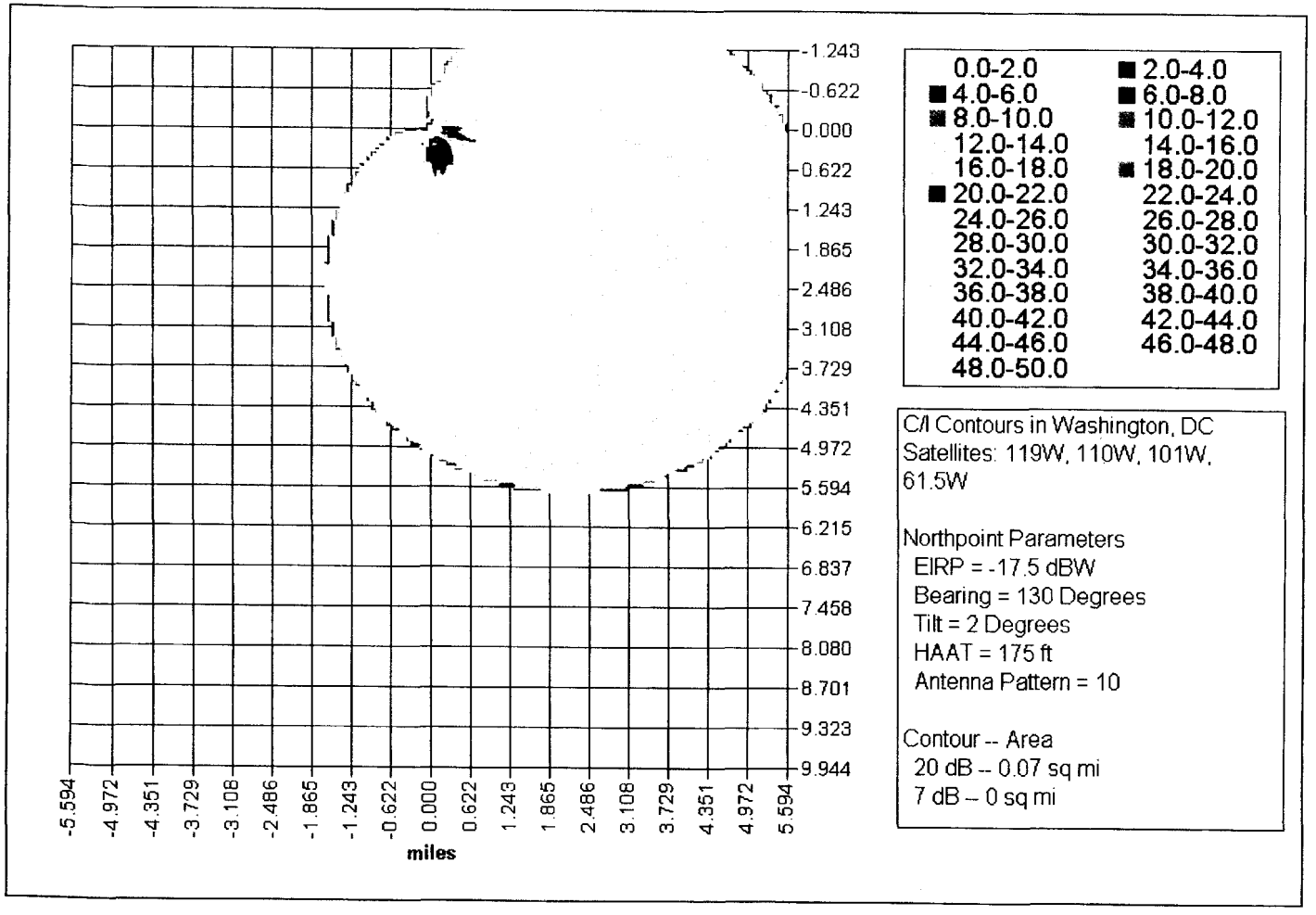
Sample Site 1: Without Northpoint Optimization



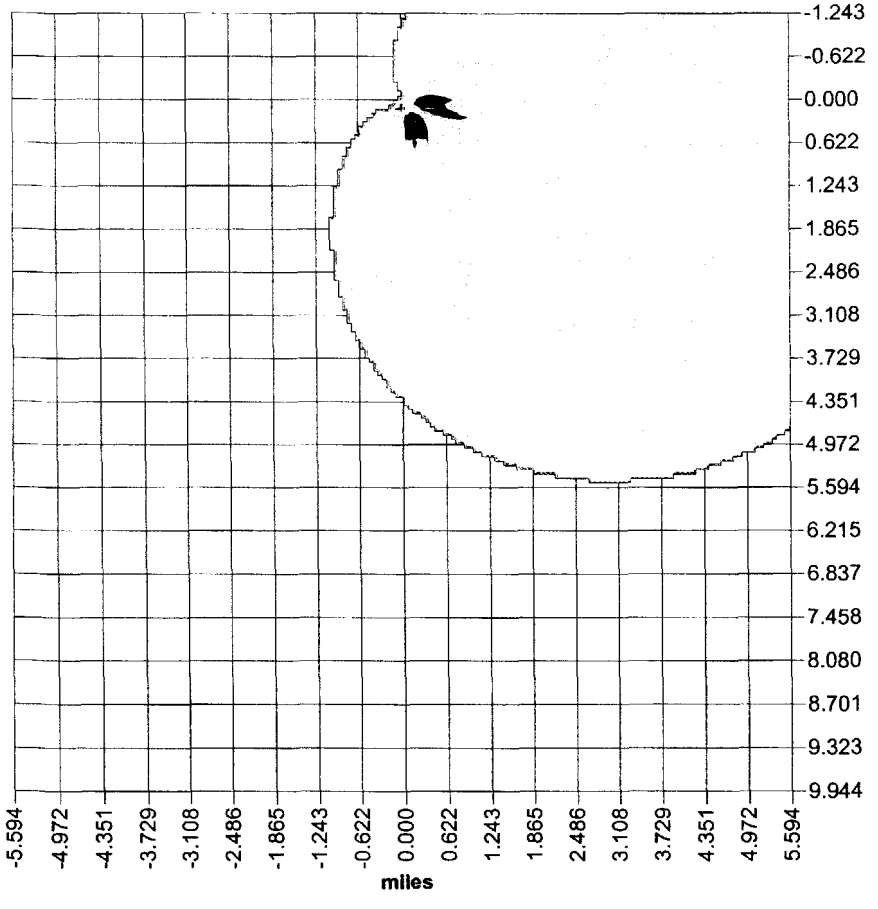
Sample Site 1: With Northpoint Optimizations



Sample Site 1 – Demonstration of Moving the Mitigation Zone



Northpoint Deployment at USA Today During Washington Operations in 1999



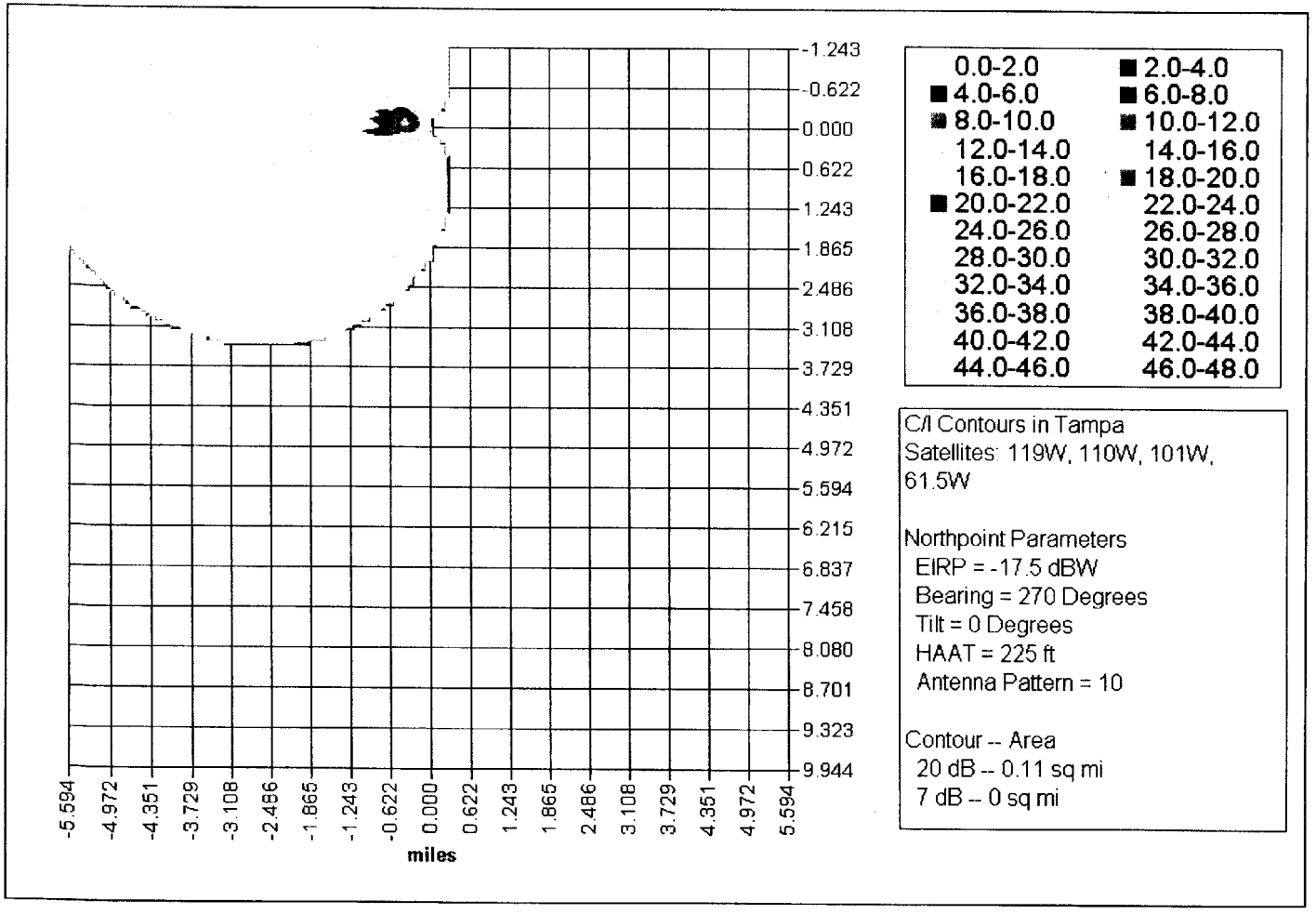
0.0-2.0	2.0-4.0
4.0-6.0	6.0-8.0
8.0-10.0	10.0-12.0
12.0-14.0	14.0-16.0
16.0-18.0	18.0-20.0
20.0-22.0	22.0-24.0
24.0-26.0	26.0-28.0
28.0-30.0	30.0-32.0
32.0-34.0	34.0-36.0
36.0-38.0	38.0-40.0
40.0-42.0	42.0-44.0
44.0-46.0	46.0-48.0
48.0-50.0	

C/I Contours in Washington, DC
Satellites: 119W, 110W, 101W, 61.5W

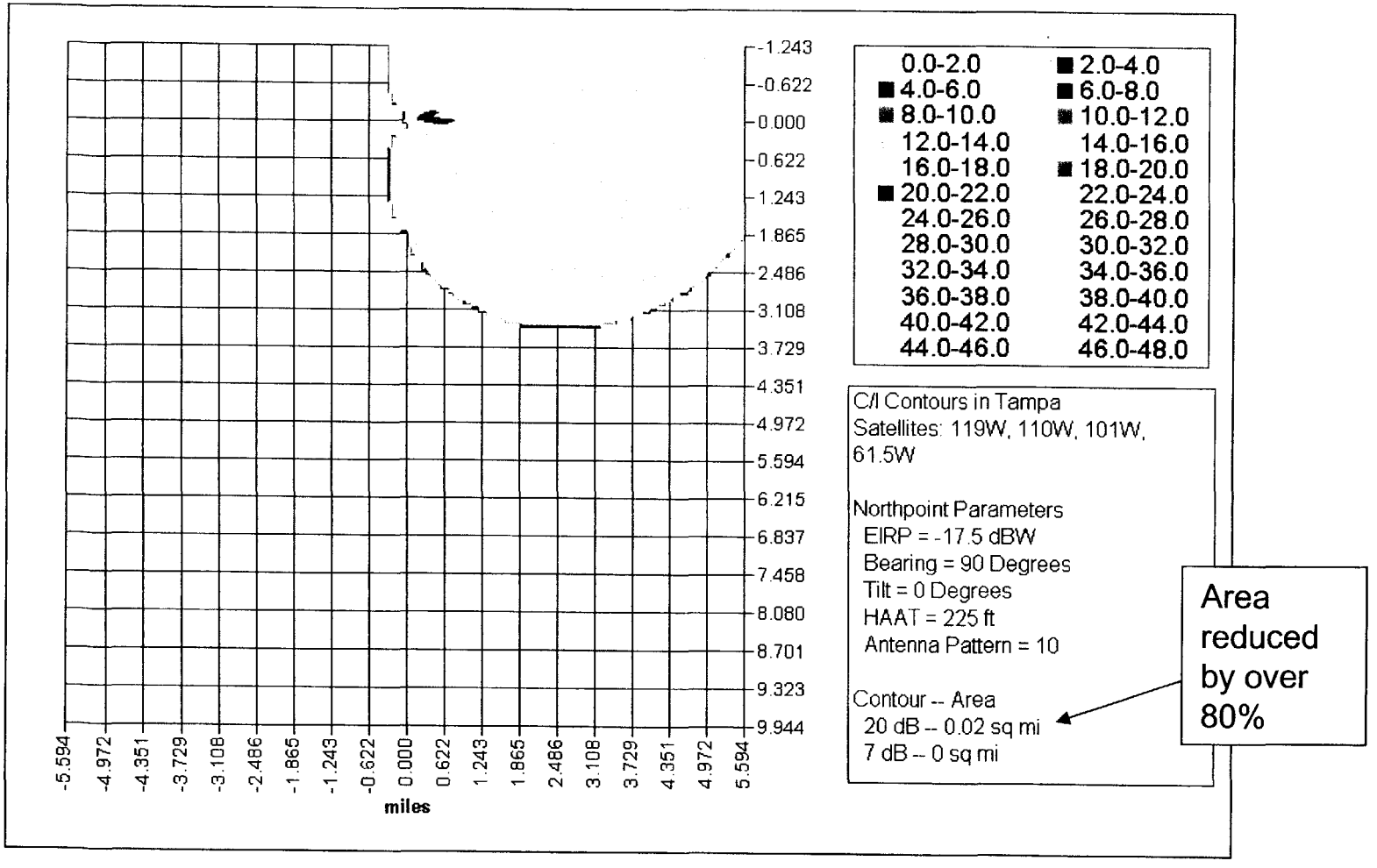
Northpoint Parameters
EIRP = -17.5 dBW
Bearing = 113 Degrees
Tilt = 0 Degrees
HAAT = 375 ft
Antenna Pattern = 10

Contour -- Area
20 dB -- 0.03 sq mi
7 dB -- 0 sq mi

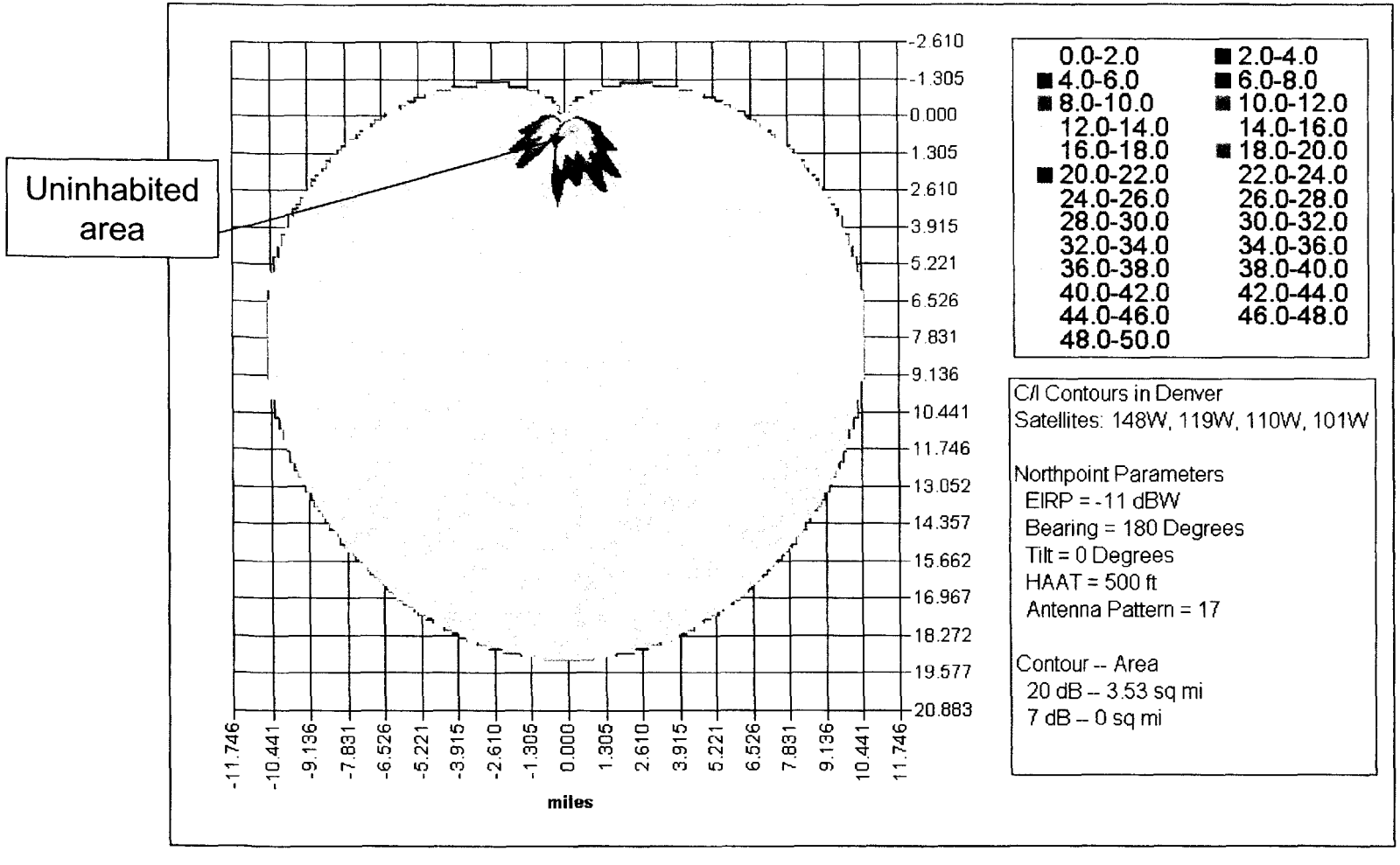
Tampa: Transmitter Bearing = 270 Degrees



Tampa: Transmitter Bearing = 90 Degrees Demonstration of Using Rotation to Reduce Mitigation Zone



Rural Area: Transmission from a Mountain



The Washington Conceptual Deployment

- Conceptual Deployment demonstrates Northpoint principals used in a large area
  - Over 1,300,000 total households in Conceptual Deployment region
  - Over 1,800 square miles in total area
  - 24 Northpoint cells
    - Total households within mitigation zone: 289 households
    - On the average fewer than 20% (58 households) would be likely to have DBS*

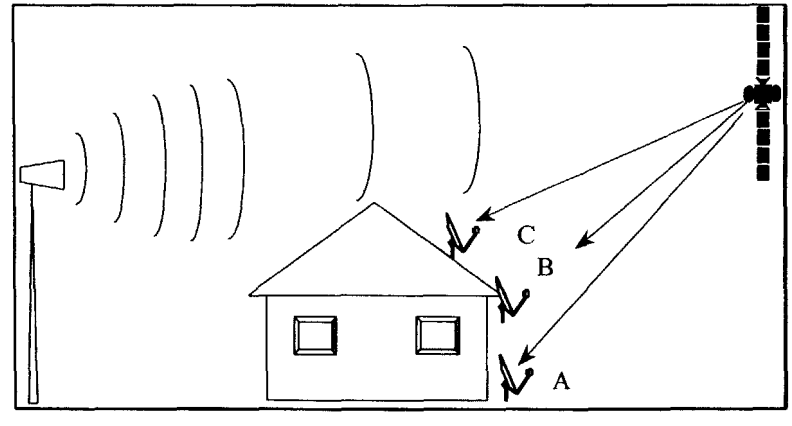
*Actual DBS usage among all households in Washington, D.C. is 8.3% according to Sky Trends 4/01 (9.22% multiplied by a 90% SkyTrend multi-receiver factor)

Natural Shielding – A Real World Factor Present at 86% of All DBS Consumers

- Contour maps are drawn in an idealized way - as if the earth were flat.
  - Real landscapes have natural features that significantly reduce the potential for interference.
- Most DBS dishes are located on porches, chimneys, low points on roofs, etc., with an obstacle between the Northpoint transmitter and the consumer dish.
- A national consumer survey of DBS consumers* conducted for Northpoint in July 1999 showed that 86% of all DBS dishes have natural shielding from a Northpoint signal.

* Bennett, Petis & Blumenthal

86% of satellite dishes are positioned as shown

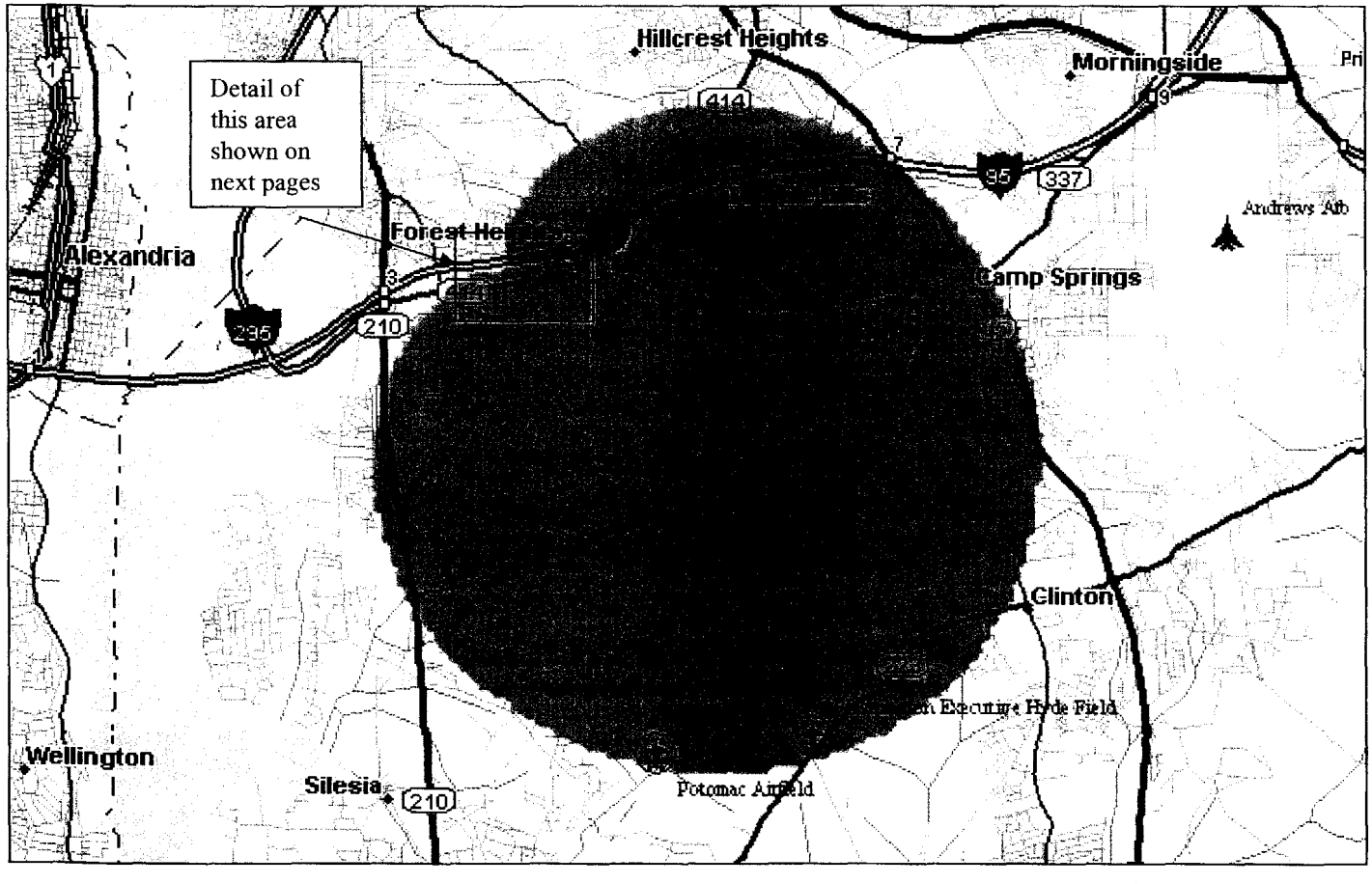


Washington, D.C.	HH Current 8.3% DBS	HH 20% DBS
Total households	1.3M	1.3M
HH within 20 dB contour	289	289
Potential DBS subscribers*	24	58
No natural shielding (14%)	3	8

Examination of a Particular Mitigation Zone

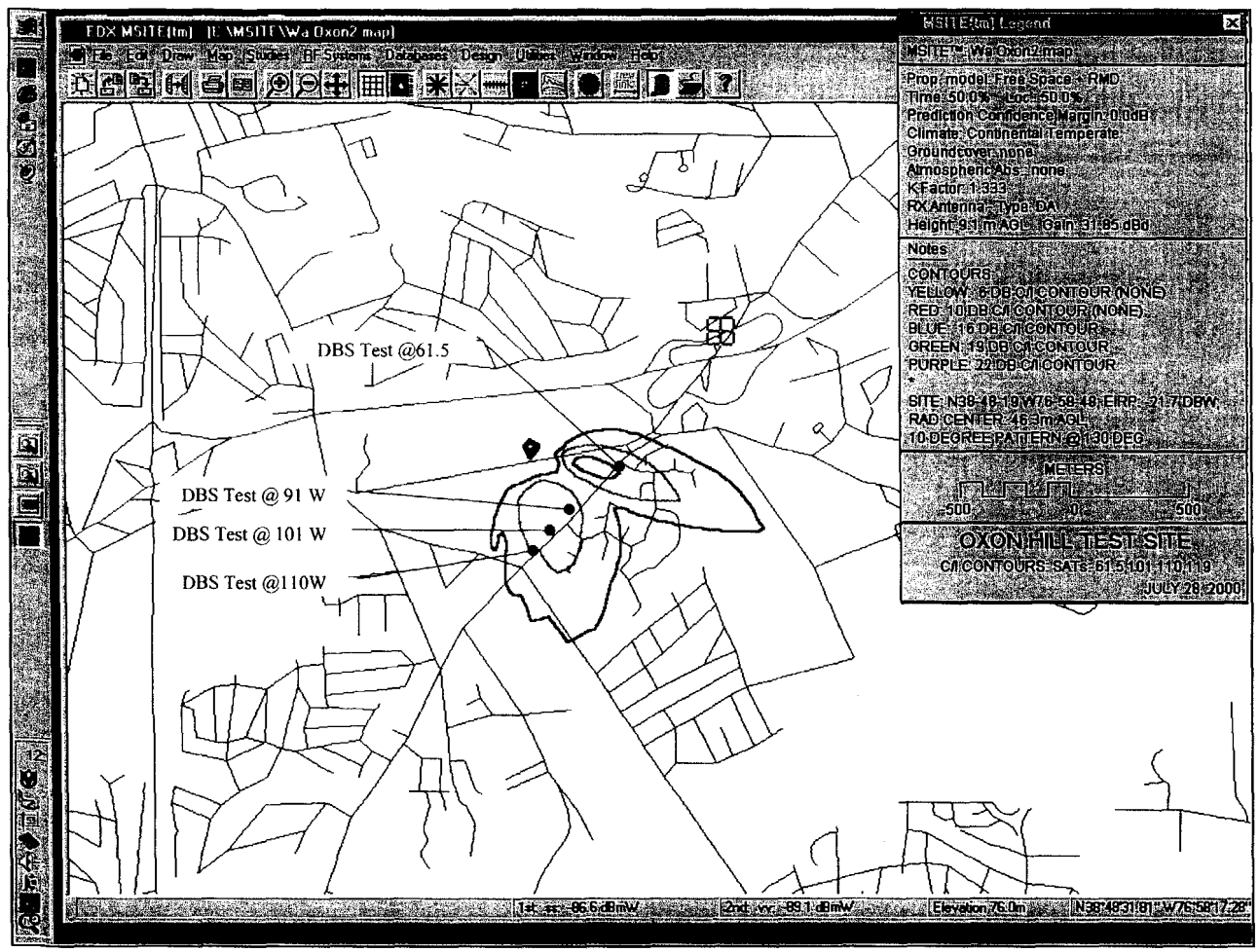
- In 2000 DBS performed its own "tests" and operated its own "Northpoint transmitter" at one of the locations in the Northpoint Conceptual Deployment:
  - Office building in Oxon Hill, Maryland
  - Worst case location in the Conceptual Deployment (highest number of potential households in mitigation area)

The Oxon Hill Service Area



The green area defines the approximate border of the service area of the Oxon Hill cell, an area of approximately 32 square miles.

Oxon Hill Deployment as Specified by Northpoint



Results of DBS Oxon Hill Operations

- *DBS did not identify even a single DBS customer whose service would be impaired in any way from Northpoint operations at Oxon Hill.*
- DBS readings were taken very near transmitter in parking lots and along the road where no DBS customers could be located.
- In a final effort to show harmful interference from Northpoint, DBS turned up its power approximately 30 times the level specified by Northpoint causing DBS test dishes to fail to receive.
  - Northpoint used DBS test-to-failure transmissions to demonstrate the use of flat panel antennas to mitigate interference.
    - Flat panel never failed even at highest DBS power.
    - Proof that Northpoint has available the means to mitigate even very high power operations.

MITRE Report

- The MITRE report confirms Northpoint filings and Commission Decision.
- Handout

Northpoint Proposal

- Northpoint proposal:
- Adopt a power limit (called an EPFD) as an interference criterion.
  - 20 dB C/I ratio (23 dB for high powered DBS links) to all DBS customers.
  - Analysis shows that 20 dB will ensure that no DBS customer have greater than 10% increase in unavailability and most will have much higher protection as a result of free space loss.
  - 10% is same allowance afforded to NGSO systems in this proceeding.
- Consistent with current FCC proceeding:
  - Northpoint EPFD proposal meets "10 minutes in worst month" Commission proposal found in NFPRM.
  - NGSOs interference criterion is an EPFD based on a 10% increase in unavailability.

There Is Ample FCC Precedent and Other Support for the Northpoint Proposal

- Consistent with digital television rules:
  - DTV rules specify C/I ratios of 21 and 23 dB respectively for analog and digital co-channel operations.[1]
- Consistent with MITRE:
  - Northpoint's criterion is equal to the 10% "increase in outages" standard recommended by MITRE.[2]
- Consistent with the way DBS treats itself and other DBS providers:
  - DBS to DBS interference uses a 20 dB C/I ratio.[3]

1. 47 CFR 73.623
2. MITRE Report at 6-6
3. FCC R&O Appendix G (20.7 dB C/I for DirecTV; 20 dB C/I for EchoStar)

Previous DBS Proposals Were Based on C/I Similar to that Proposed by Northpoint

- DirecTV used a C/I ratio of 19 dB (a 20% increase in unavailability) in "Terrestrial Interference in the DBS Downlink Band." (DirecTV, April 11, 1994)
- "Tempo believes the TI DBS report by DirecTV, which specified a C/I ratio of 19 dB, causing a reduction of 20% availability in subscriber systems is more accurate [as a standard for protection]." (Comments of Tempo Satellite, Inc. in RM 9245, April 20, 1998, paragraph 5a)
- "Echostar estimates that a more acceptable Carrier-to-Interference level would be at least 20 dB (equal to the cross polarization isolation level of the Low Noise Block Down Converter with Integrated Feedhorn)." (Opposition of Echostar Communications Corporation, RM 9245, April 20, 1998, page 9)

What's Wrong With the DBS Proposal?

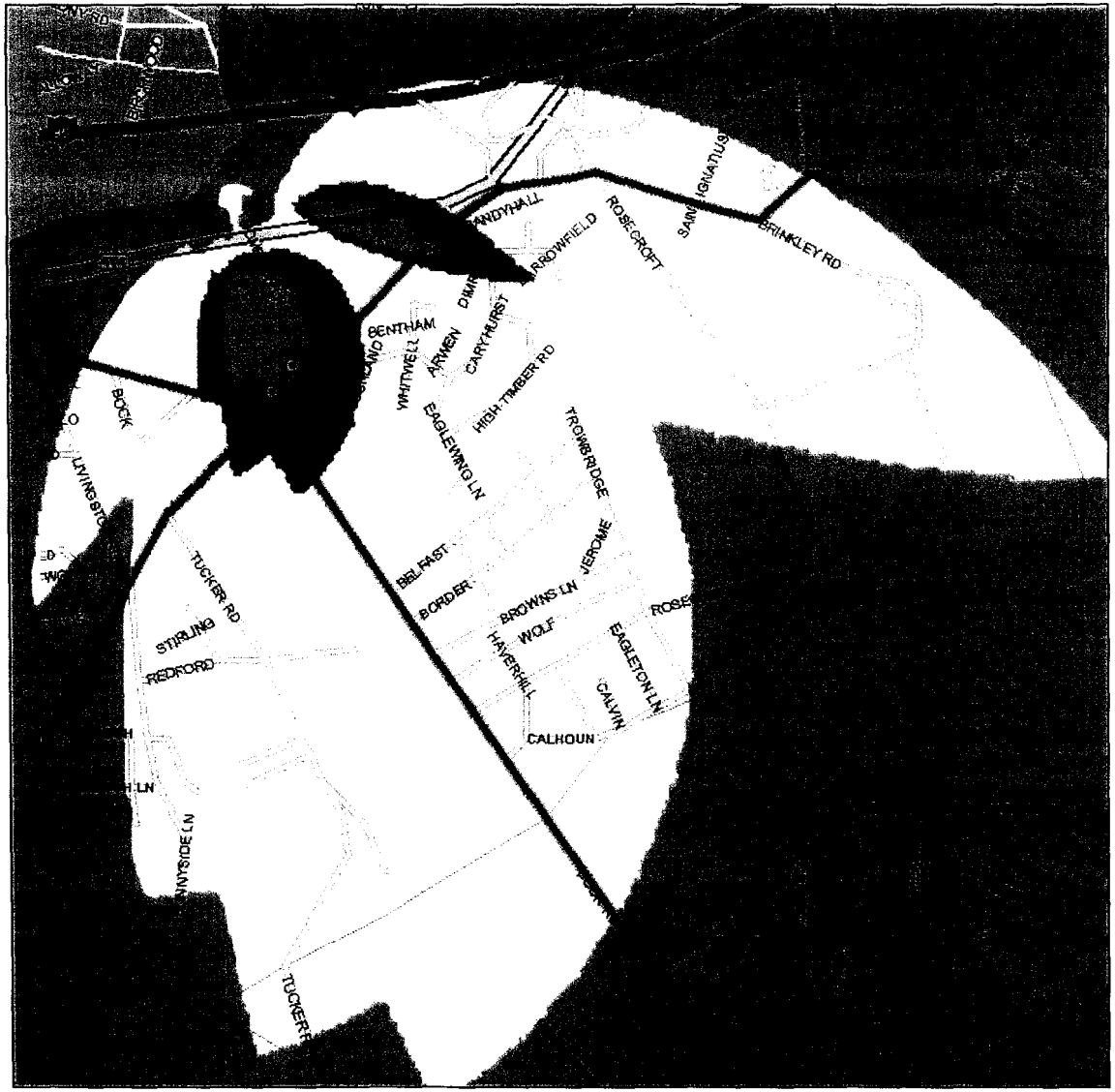
- DBS (DirecTV) latest proposal:
  - EPFD limit based 28 dB C/I
  - Equivalent to 2.86% "increase in unavailability" (DBS estimate)
- Why was 2.86% chosen?
  - Mathematical result of dividing 10% by 3.5!
    - 10% was the negotiated "increase in unavailability" that DBS offered NGSO systems
    - 3.5 was an arbitrary number of NGSOs
- Thus, the 2.86% was not even based on any real *satellite* systems - much less any analysis of the Northpoint *terrestrial* system.
- There is not a single statement in the record that provides any rationale for this specific criterion from a consumer perspective.

DBS Failed to Support 2.86% Proposal at Oxon Hill Tests

Location of DBS Oxon Hill Readings

Yellow region represents the incremental area where DBS proposes that Northpoint mitigate DBS consumers.

DBS did not take a single reading in this incremental area or document any consumer in this area (or in *any* area of Oxon Hill) that would have any impairment whatsoever from Northpoint operations.



The 2.86% DBS Proposal is Arbitrary and Without Precedent

- 2.86% was explicitly rejected by MITRE, the Congressionally mandated independent testing body charged with examining this very issue.
- As MITRE noted when it rejected the 2.86% DBS proposal, "2.86% is very small."
- However, exactly how small bears examination: According to A.C. Nielsen, television is on in the home an average of 7 hours per day (153,300 minutes).

Annual Television Minutes - Washington D.C.					
Available	Unavailable	Current minutes unavailable	2.86% of current minutes	10% of current minutes	Minutes difference
99.95%	0.05%	76.65	2.19	7.66	5.47

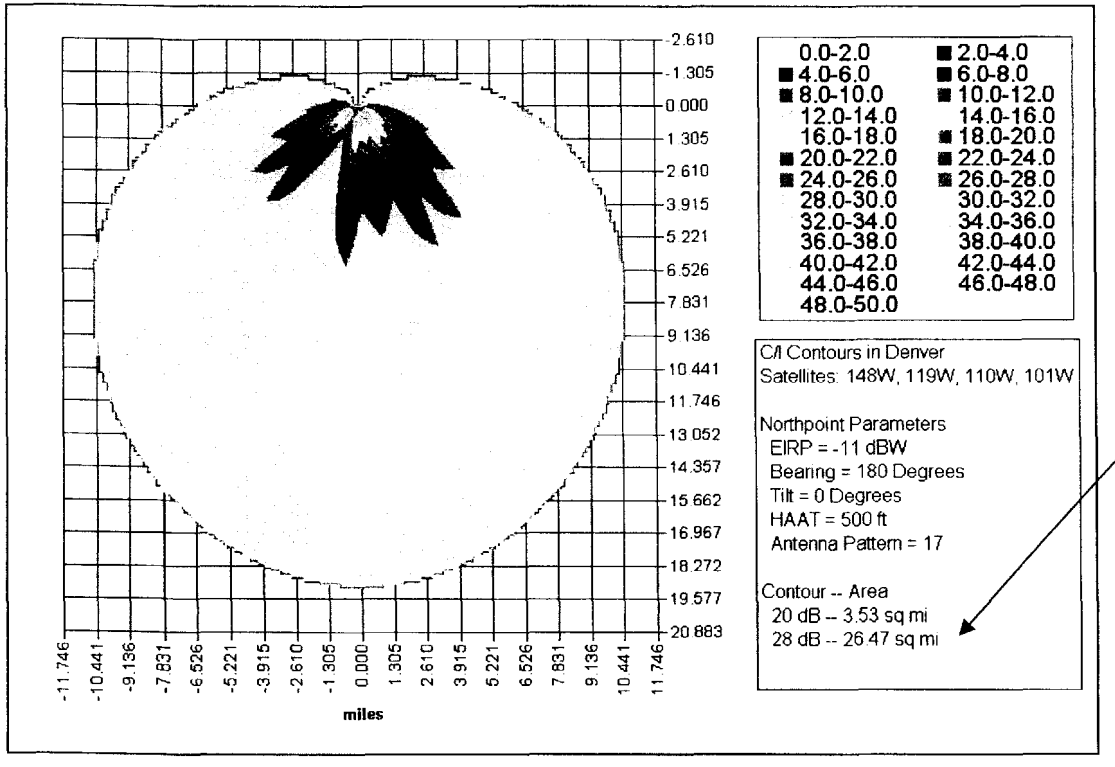
- Remember this amount is the *worst* case: for the few homes near the transmitter that do not have natural shielding. All other consumers have less or no impact.

Difference Between DBS and Northpoint Proposal

- Consumer television experience – no difference
  - No one can detect an incremental 5 minutes (or 1 minute!) out of 153,300 minutes of television viewing; It is certainty not harmful interference.
- Difference between the two is potentially enormous for Northpoint
  - 20 dB contour = 0.0 – 1.0% of service area
  - 28 dB contour = 5 - 10% of service area
  - 14 – 25K cells nationwide 28 dB = over 100,000 sq. mi of additional mitigation
- Increase the cost of every Northpoint deployment throughout the country
  - Northpoint's service would be more expensive for every consumer
  - In some rural areas (particularly in the Southwest) the costs of implementing the proposal could be so significant that deployment could be precluded.
- Northpoint believes the 2.86% proposal is an effort by an incumbent to burden a new competitor with unprecedented obligations that provide no consumer benefit.

* Mitigation estimate is based on 20K cells averaging 70 sq. mi each with an average of 6.5% additional mitigation area

Rural Areas in Southwest: Comparison of DBS and Northpoint Proposals



DBS Proposal would require 23 incremental sq. mi. of mitigation to prevent incremental outages of 66 seconds per year.

Annual Television Minutes - Southwest					
Available	Unavailable	Current minutes unavailable	2.86% of current minutes	10% of current minutes	Minutes difference
99.99%	0.01%	15.3	0.4	1.5	1.1

Commission Proposals Supported by Northpoint

- The Commission has proposed and Northpoint supports:
  - Northpoint's mitigation obligations (regardless of the interference criterion used) be limited to the first 18 months after deployment.
  - Required mitigation based on "consumer complaints" rather than house to house measurement or surveys.

Conclusion

- The 20 dB C/I interference criterion proposed by Northpoint:
  - Consistent with current Commission proposal (10 minutes in worst month option)
  - Provides sufficient protection to DBS customers
  - Does not require an excessively large mitigation region
  - Easily measurable and consistent with the FCC's rules for other services, including broadcast television, DBS and NGSOs.
  - Will enable Northpoint's Broadwave affiliates to deploy throughout the United States, including all of the Southwest.
- Deployment of Northpoint
  - Hasten new services to consumers, including local signals to subscribers of satellite television services and broadband to rural areas.
  - Provide cable competition where there presently is little or none.
- Northpoint is the only applicant to provide MVDDS service before the Commission that has passed the statutory independent testing – Northpoint is ready to go.

CERTIFICATE OF SERVICE

I, Shannon Thrash, hereby certify that on this 17th day of October, 2001, copies of the foregoing were served by hand delivery* or first class United States mail, postage prepaid, on the following:

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