

Environmental Protection

There are two main factors that should be addressed in order to make sure that the environment around a proposed facility is protected.

1) Significant affects to the environment.

EMF's proposed facility will be constructed on an existing unregistered tower in an established "antenna farm". The site proposed herein has both registered and unregistered towers on the site. According to 47 C.F.R. Section 1.1306 Note 3, such facilities "will be categorically excluded" from environmental processing except for the RF requirements of Section 1.1307(b).

2) Human exposure to excess levels of radiofrequency radiation.

In order to comply with OET 65, EMF carefully investigated RF sources on the site, and learned that the site is not straightforward. There are multiple towers and multiple radiators on each tower. The proposed modification to KFDN is to be built on a structure that, according to FCC records is within 200 meters of a number of broadcast facilities and applications.

KFDN is currently licensed and radiating at the proposed structure. In order to license the facility at its current location and power, compliance with Special Operating Conditions was required. To satisfy those requirements, a Radio Frequency Exposure Survey was performed and showed that KFDN produced only minimal contribution to the total RF on the site at its current ERP of 430 watts (see copies of the original licensing Exhibits 9 and 9 supplemental attached as Exhibits 22-A & 22-B).

Considering that the previously performed RF study showed that KFDN contributed less than 5% of the Controlled/Occupational Exposure limits of OET-65, and that the overall site was at or below 19% of those limits, EMF believes the instant application will not significantly change the RF environment.

In Exhibit 22-C, EMF compares the existing operation of KFDN with that of the proposed facility, ignoring all other facilities. The highest theoretical exposure caused by the present operation is $45.97 \mu\text{w}/\text{cm}^2$, clearly supporting the findings shown in EMF's license filing (File Number BLED-20041202AGK). The proposed operation increases the highest value by $82.31 \mu\text{w}/\text{cm}^2$ (to $128.28 \mu\text{w}/\text{cm}^2$) which, if added to the maximum value of 19% found during the on-site measurements, would only produce 27.23% overall.

The structure is on private property with a two mile long access road. There is a gate located at the bottom of the mountain (two miles from the structure) and is always locked. The access road terminates at the structure site and does not provide access to any other property. The structure is fenced with locked gates and RF notice signs posted.

Therefore, EMF respectfully requests that the Commission grant the instant Construction Permit. If the Commission feels it necessary, EMF will make RF measurements prior to Commission grant of Program Test Authority.

EMF agrees to continue to fully cooperate with other site users to reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Compliance with Special Operating Conditions

The Construction Permit contains two Special Operating Conditions, summarized as follows:

1. The permittee must make proper radiofrequency electromagnetic (RF) field strength measurements throughout the transmitter site area to determine if there are any areas that exceed the FCC guidelines for human exposure to RF fields, and if necessary, install fencing and signs to preclude casual or inadvertent access.
 2. The permittee/licensee must cooperate with other site users to reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.
- The first condition has been met. The site does not exceed the uncontrolled (public) exposure limits of OET-65, therefore no fencing or signs are necessary. The study documentation may be found in Exhibit 9A. Note that the study was performed with a transmitter power output of 431 watts, and the study states that the ERP would therefore be approximately 400 watts. According to EMF's calculations (see below), the actual ERP would be 529 watts (123% of the authorized 430 watts). Though this was unintentional on the part of the testers, and only in effect for a short time during the testing process, EMF believes that it serves to further demonstrate EMF's minimal contribution to RF on the site since normal operations will be at 100% of the authorized power.
 - TPO calculations (normal operation):
 - $430 \text{ watts ERP} \div \text{the antenna efficiency of } 1.397 = 307.8 \text{ watts into the antenna.}$
 - 90 feet of Andrew 1/2" foam coax is approximately 87.8% efficient at 90.9 MHz.
 - $307.8 \text{ watts} \div 0.878 = 350.6 \text{ (351) watts from transmitter.}$
 - TPO calculations (as tested):
 - $529 \text{ watts} \div 1.397 = 378.7 \text{ watts into antenna.}$
 - $378.7 \text{ watts} \div 0.878 = 431.3 \text{ (431) watts from transmitter.}$
 - EMF agrees to fully cooperate with other site users to reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Therefore, all Special Operating Conditions of the KFDN-FM Construction Permit (FCC File Number BPED-20031114AJH) have been met.

**Pericle Communications Company**

November 28, 2004

Via Email

Mr. Bob Helms
K-LOVE Radio Network
5700 West Oaks Blvd.
Rocklin, CA 95765

Subject: Radio Frequency Exposure Survey for 88.1-FM on Mt. Morrison

Dear Mr. Helms:

The purpose of this letter is to report the results of the radio frequency exposure survey we conducted on November 24, 2004 at the 88.1-FM transmitter site on Mt. Morrison. The purpose of this survey was to verify that 88.1-FM complies with FCC guidelines for exposure to radio frequency energy. Exposure measurements taken on that day show that 88.1-FM does comply.

Background. The applicable standards for human exposure to radio frequency energy are found in CFR Title 47, Parts 1.1307 - 1.1310, October 1, 2004. These guidelines were developed by the FCC in coordination with other Federal Government agencies. In the FM broadcast band where 88.1-FM operates, the occupational exposure limit is 1,000 $\mu\text{watts}/\text{cm}^2$. The public exposure limit is 200 $\mu\text{watts}/\text{cm}^2$. These are time-averaged limits, so momentary exposure above these levels does not necessarily exceed FCC guidelines.

The occupational exposure limit applies to personnel who are trained in the field, but it also applies to the public as long as the exposure is a consequence of traveling through the area, the area is properly marked, and the public can exercise control over their exposure. Mt. Morrison falls into this category because it is a remote site on private property and no public roadways or trails pass through the property. Where measured levels exceed the public limit, but are below the occupational limit, blue "Notice" signs are posted to warn the public of the potential for exposure. The only areas subject to exposure above the occupational limit are above ground on the radio towers. The towers are fenced and the gates are locked. Only authorized, trained personnel are allowed to work on the towers and transmitter power is lowered as necessary before tower work is done. Tower climbers are also required to carry personal RF monitors when working above ground on the radio towers.

The FM station of interest is operating from the Channel 20-TV tower facility which consists of a 278' guyed tower, ice bridge and transmitter building. Other broadcast tenants operating from this facility are Channel 20-TV, Channel 14-TV and KIMN-FM (100.3).

Results of RF Survey. An exposure survey was conducted on November 24, 2004 by Jay Jacobsmeyer (*Pericle Communications Company*) and Bob Helms (*EMF Broadcasting*). The

Exhibit 22 - A

weather was clear with an outside temperature of 20° F and a dusting of snow on the ground. We used a Wandel & Goltermann (W&G) Model EMR 300 broadband exposure meter with a type 25.1 shaped probe. Measurements were conducted in accordance with FCC publication OET-65 and ANSI C95.3-2002. The 88.1-FM antenna is an ERI two-bay, vertically polarized antenna with half-wavelength spacing. Transmitter power is 431 Watts and the ERP is approximately 400 Watts.

Before presenting the survey results, it is helpful to know the theoretical bounds where 88.1-FM could create levels above the applicable limit. The radio site is a controlled environment and the applicable standard is $1,000 \mu\text{watts}/\text{cm}^2$. With an ERP of 400 Watts, the worst-case minimum distance is 8 feet. The antenna is located 15 feet above the ground and one must be on the ice bridge to be within 8 feet of the antenna. The ice bridge is behind an 8' high fence with multiple strands of barbed wire at the top. It is not accessible to the public. Thus, it is not theoretically possible for 88.1-FM alone to create levels on the ground in excess of the FCC limit.

Spatial average measurements were conducted at 27 locations on either side of the ice bridge at ground level. Two sets of measurements were taken at each location, one with 88.1-FM off-air and one with 88.1-FM operating at full power (400 Watts ERP). All measurements were below the occupational limit. In fact, there were negligible differences between the two sets of measurements except directly below the 88.1-FM antenna where the measured contribution from 88.1 was 2.3% of the occupational limit.

The survey results are shown in Figure 1 where the top value is with 88.1-FM off-air and the bottom value (in parentheses) is with 88.1-FM at 400 Watts ERP. Please note that the effective noise floor of the meter is 0.5%, so any recorded levels below this floor are not reliable. Also note that the television stations have time-varying amplitudes which may account for measured levels that are lower with 88.1-FM on-air.

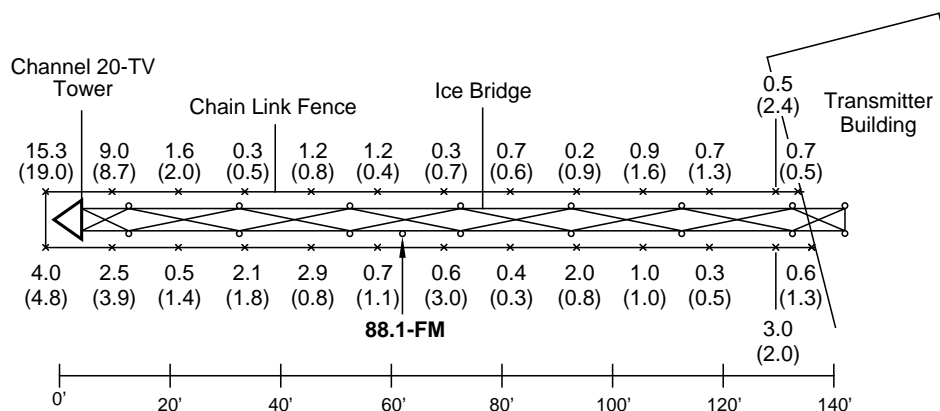


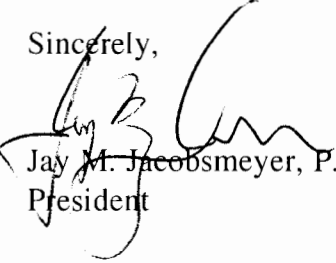
Figure 1 - Spatial Average Measurements (% of FCC Occupational Limit)

Conclusions. The 88.1-FM transmitter and antenna comply with Federal guidelines for radio frequency exposure and do not create a radio frequency safety hazard to the public.

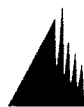
Exhibit 22 - A

If you have any questions regarding this matter, you can reach me at (719) 548-1040 or via email at jacobsmeier@pericle.com.

Sincerely,



Jay M. Jacobsmeier, P.E.
President



Pericle Communications Company

January 19, 2005

Via Email & Fedex

Mr. Sam Wallington
K-LOVE Radio Network
5700 West Oaks Blvd.
Rocklin, CA 95765

Subject: Radio Frequency Exposure Survey for 88.1-FM (KFDN) on Mt. Morrison

Dear Mr. Wallington:

The purpose of this letter is to clarify two points regarding the November 24, 2004 survey at the 88.1-FM transmitter site on Mt. Morrison. These clarifications are made at the request of the FCC staff. For background information, please refer to my November 28, 2004 letter with the same subject. The two points requiring clarification are these:

1. Status of Other Stations. All other broadcast stations were operating at full power on the day of the survey. Thus, the measurements reflect normal conditions on the antenna site. The other broadcasters at this location are KIMN-FM (100.3), Channel 14-TV, and Channel 20-TV. There are also several low-power land mobile radio stations at this site.

2. Basis for Compliance. To show compliance, it is first necessary to categorize the site as a controlled or uncontrolled environment. The definitions from CFR Title 47, Parts 1.1307 - 1.1310 are as follows:

Controlled Environment - "Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure."

Uncontrolled Environment - "General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure."

The antenna site sits on the shoulder of Mt. Morrison at an elevation of 7,686 feet AMSL. The site and the 2 mile long access road are both private property. The gate is located at the bottom of the mountain (2 miles from the site) and it is always locked. The access road terminates at the site and does not provide access to any other property. The approaches to the site from the north, east and south are extremely steep and in some cases sheer cliffs. There are no hiking trails through the site and the adjacent peak of Mt. Morrison is accessible to hikers through public lands and not through the property. The 40 acre antenna site is

surrounded by thousands of acres of open space land and some undeveloped private property. At locations where ground level power densities exceed the public limit, RF Notice signs are posted. The only locations exceeding the occupational limit are above ground level on the towers, which are completely fenced with top strands of barbed wire and locked gates. Thus, by virtue of its rural location on private property and limited access, Mt. Morrison is a controlled environment and the occupational limit applies.

We can make the following conclusions regarding compliance with FCC guidelines for human exposure:

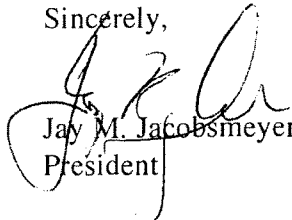
1) Measurements taken on November 24, 2004 show that ground level power densities are well below the occupational limit. The highest reading was 19% of the occupational limit.

2) Although not necessary to show compliance, on-off measurements taken on November 24, 2004 show that the contribution of 88.1-FM (KFDN) is less than 5% of the occupational limit.

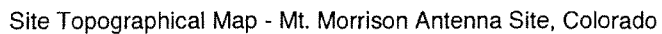
There are locations on the south ridge of the site (330 feet south of the tower and roughly 120 feet above the tower base) with measured power densities above the public limit, but below the occupational limit. These locations are clearly posted with RF Notice signs and have been since March of 1999. Regardless, one can show analytically that 88.1-FM contributes much less than 5% of the *public limit* at these locations because the station operates with an ERP of 430 Watts and is almost 400 feet away. Previous surveys have shown that KIMN-FM is the dominant contributor at these locations.

If you have any further questions regarding this matter, you can reach me at (719) 548-1040 or via email at jacobsmeyer@pericle.com.

Sincerely,


Jay M. Jacobsmeyer, P.E.
President

Attachment:
Site Topographical Map



RF Analysis: Lakewood, CO

KFDN . Proposed

201

C3

Site type: Application

Channel: 201

Class: C3

ERP: 1.2 kw

Antenna: ERI

Dipole

2-bay

.5 wave

COR AGL: 7 m

Polarization: vertical only

Distance From Tower (m)	KFDN.P Facility	Total RF (uW/cm2)	Percent of 1000uW/cm2	Percent of 200uW/cm2
0	0.0000	0.00	0.00	0.00
1	0.1859	0.19	0.02	0.09
2	2.8307	2.83	0.28	1.42
3	12.1386	12.14	1.21	6.07
4	29.1699	29.17	2.92	14.58
5	53.0404	53.04	5.30	26.52
6	73.7092	73.71	7.37	36.85
7	90.3323	90.33	9.03	45.17
8	96.6858	96.69	9.67	48.34
9	110.8876	110.89	11.09	55.44
10	127.6373	127.64	12.76	63.82
11	128.2837	128.28	12.83	64.14
12	126.2104	126.21	12.62	63.11
13	121.2811	121.28	12.13	60.64
14	115.2794	115.28	11.53	57.64
15	108.8537	108.85	10.89	54.43
16	101.1349	101.13	10.11	50.57
17	93.7844	93.78	9.38	46.89
18	86.9043	86.90	8.69	43.45
19	80.5290	80.53	8.05	40.26
20	74.4351	74.44	7.44	37.22
21	68.8178	68.82	6.88	34.41
22	63.7137	63.71	6.37	31.86
23	59.0797	59.08	5.91	29.54
24	54.8726	54.87	5.49	27.44
25	51.0512	51.05	5.11	25.53
26	47.5770	47.58	4.76	23.79
27	44.7304	44.73	4.47	22.37
28	42.1476	42.15	4.21	21.07
29	39.7615	39.76	3.98	19.88
30	37.5553	37.56	3.76	18.78
31	35.5136	35.51	3.55	17.76
32	33.6222	33.62	3.36	16.81
33	31.8682	31.87	3.19	15.93
34	30.2397	30.24	3.02	15.12
35	28.7260	28.73	2.87	14.36
36	27.3172	27.32	2.73	13.66
37	26.0045	26.00	2.60	13.00
38	24.7800	24.78	2.48	12.39
39	23.6362	23.64	2.36	11.82
40	22.5733	22.57	2.26	11.29
41	21.5922	21.59	2.16	10.80
42	20.6713	20.67	2.07	10.34
43	19.8059	19.81	1.98	9.90
44	18.9920	18.99	1.90	9.50
45	18.2255	18.23	1.82	9.11

RF Analysis: Lakewood, CO

KFDN . Current

201

A

Site type: License

Channel: 201

Class: A

ERP: 0.43 kw

Antenna: ERI

Dipole

2-bay

.5 wave

COR AGL: 7 m

Polarization: vertical only

Distance From Tower (m)	KFDN.C Facility	Total RF (uW/cm2)	Percent of 1000uW/cm2	Percent of 200uW/cm2
0	0.0000	0.00	0.00	0.00
1	0.0666	0.07	0.01	0.03
2	1.0143	1.01	0.10	0.51
3	4.3496	4.35	0.43	2.17
4	10.4525	10.45	1.05	5.23
5	19.0062	19.01	1.90	9.50
6	26.4125	26.41	2.64	13.21
7	32.3691	32.37	3.24	16.18
8	34.6457	34.65	3.46	17.32
9	39.7347	39.73	3.97	19.87
10	45.7367	45.74	4.57	22.87
11	45.9683	45.97	4.60	22.98
12	45.2254	45.23	4.52	22.61
13	43.4591	43.46	4.35	21.73
14	41.3084	41.31	4.13	20.65
15	39.0059	39.01	3.90	19.50
16	36.2400	36.24	3.62	18.12
17	33.6061	33.61	3.36	16.80
18	31.1407	31.14	3.11	15.57
19	28.8562	28.86	2.89	14.43
20	26.6726	26.67	2.67	13.34
21	24.6597	24.66	2.47	12.33
22	22.8308	22.83	2.28	11.42
23	21.1702	21.17	2.12	10.59
24	19.6627	19.66	1.97	9.83
25	18.2934	18.29	1.83	9.15
26	17.0484	17.05	1.70	8.52
27	16.0284	16.03	1.60	8.01
28	15.1029	15.10	1.51	7.55
29	14.2479	14.25	1.42	7.12
30	13.4573	13.46	1.35	6.73
31	12.7257	12.73	1.27	6.36
32	12.0480	12.05	1.20	6.02
33	11.4195	11.42	1.14	5.71
34	10.8359	10.84	1.08	5.42
35	10.2935	10.29	1.03	5.15
36	9.7887	9.79	0.98	4.89
37	9.3183	9.32	0.93	4.66
38	8.8795	8.88	0.89	4.44
39	8.4696	8.47	0.85	4.23
40	8.0888	8.09	0.81	4.04
41	7.7372	7.74	0.77	3.87
42	7.4072	7.41	0.74	3.70
43	7.0971	7.10	0.71	3.55
44	6.8054	6.81	0.68	3.40
45	6.5308	6.53	0.65	3.27

RF Analysis: Lakewood, CO

KFDN . Proposed

201

C3

RF Analysis: Lakewood, CO

KFDN . Current

201

A

continued

Distance From Tower (m)	KFDN.P Facility	Total RF (uW/cm2)	Percent of 1000uW/cm2	Percent of 200uW/cm2	Distance From Tower (m)	KFDN.C Facility	Total RF (uW/cm2)	Percent of 1000uW/cm2	Percent of 200uW/cm2
46	17.5031	17.50	1.75	8.75	46	6.2719	6.27	0.63	3.14
47	16.8216	16.82	1.68	8.41	47	6.0277	6.03	0.60	3.01
48	16.1780	16.18	1.62	8.09	48	5.7971	5.80	0.58	2.90
49	15.5697	15.57	1.56	7.78	49	5.5791	5.58	0.56	2.79
50	14.9941	14.99	1.50	7.50	50	5.3729	5.37	0.54	2.69
51	14.4492	14.45	1.44	7.22	51	5.1776	5.18	0.52	2.59
52	13.9327	13.93	1.39	6.97	52	4.9925	4.99	0.50	2.50
53	13.4428	13.44	1.34	6.72	53	4.8170	4.82	0.48	2.41
54	12.9778	12.98	1.30	6.49	54	4.6504	4.65	0.47	2.33
55	12.5359	12.54	1.25	6.27	55	4.4920	4.49	0.45	2.25
56	12.1159	12.12	1.21	6.06	56	4.3415	4.34	0.43	2.17
57	11.7162	11.72	1.17	5.86	57	4.1983	4.20	0.42	2.10
58	11.3356	11.34	1.13	5.67	58	4.0619	4.06	0.41	2.03
59	10.9729	10.97	1.10	5.49	59	3.9319	3.93	0.39	1.97
60	10.6270	10.63	1.06	5.31	60	3.8080	3.81	0.38	1.90
61	10.2970	10.30	1.03	5.15	61	3.6898	3.69	0.37	1.84
62	9.9819	9.98	1.00	4.99	62	3.5768	3.58	0.36	1.79
63	9.6808	9.68	0.97	4.84	63	3.4690	3.47	0.35	1.73
64	9.3929	9.39	0.94	4.70	64	3.3658	3.37	0.34	1.68
65	9.1175	9.12	0.91	4.56	65	3.2671	3.27	0.33	1.63
66	8.8539	8.85	0.89	4.43	66	3.1726	3.17	0.32	1.59
67	8.6014	8.60	0.86	4.30	67	3.0822	3.08	0.31	1.54
68	8.3594	8.36	0.84	4.18	68	2.9954	3.00	0.30	1.50
69	8.1273	8.13	0.81	4.06	69	2.9123	2.91	0.29	1.46
70	7.9047	7.90	0.79	3.95	70	2.8325	2.83	0.28	1.42
71	7.6910	7.69	0.77	3.85	71	2.7559	2.76	0.28	1.38
72	7.4857	7.49	0.75	3.74	72	2.6824	2.68	0.27	1.34
73	7.2884	7.29	0.73	3.64	73	2.6117	2.61	0.26	1.31
74	7.0988	7.10	0.71	3.55	74	2.5437	2.54	0.25	1.27
75	6.9164	6.92	0.69	3.46	75	2.4784	2.48	0.25	1.24
76	6.7408	6.74	0.67	3.37	76	2.4155	2.42	0.24	1.21
77	6.5718	6.57	0.66	3.29	77	2.3549	2.35	0.24	1.18
78	6.4090	6.41	0.64	3.20	78	2.2966	2.30	0.23	1.15
79	6.2522	6.25	0.63	3.13	79	2.2404	2.24	0.22	1.12
80	6.1009	6.10	0.61	3.05	80	2.1862	2.19	0.22	1.09
81	5.9551	5.96	0.60	2.98	81	2.1339	2.13	0.21	1.07
82	5.8143	5.81	0.58	2.91	82	2.0835	2.08	0.21	1.04
83	5.6785	5.68	0.57	2.84	83	2.0348	2.03	0.20	1.02
84	5.5473	5.55	0.55	2.77	84	1.9878	1.99	0.20	0.99
85	5.4205	5.42	0.54	2.71	85	1.9424	1.94	0.19	0.97
86	5.2981	5.30	0.53	2.65	86	1.8985	1.90	0.19	0.95
87	5.1797	5.18	0.52	2.59	87	1.8561	1.86	0.19	0.93
88	5.0652	5.07	0.51	2.53	88	1.8150	1.82	0.18	0.91
89	4.9544	4.95	0.50	2.48	89	1.7753	1.78	0.18	0.89
90	4.8472	4.85	0.48	2.42	90	1.7369	1.74	0.17	0.87
91	4.7434	4.74	0.47	2.37	91	1.6997	1.70	0.17	0.85
92	4.6429	4.64	0.46	2.32	92	1.6637	1.66	0.17	0.83
93	4.5455	4.55	0.45	2.27	93	1.6288	1.63	0.16	0.81
94	4.4512	4.45	0.45	2.23	94	1.5950	1.60	0.16	0.80
95	4.3597	4.36	0.44	2.18	95	1.5622	1.56	0.16	0.78
96	4.2710	4.27	0.43	2.14	96	1.5304	1.53	0.15	0.77
97	4.1850	4.18	0.42	2.09	97	1.4996	1.50	0.15	0.75
98	4.1015	4.10	0.41	2.05	98	1.4697	1.47	0.15	0.73
99	4.0205	4.02	0.40	2.01	99	1.4407	1.44	0.14	0.72
100	3.9418	3.94	0.39	1.97	100	1.4125	1.41	0.14	0.71