

***COMPREHENSIVE TECHNICAL EXHIBIT  
APPLICATION FOR CONSTRUCTION PERMIT***

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**FM TRANSLATOR STATION K269FB  
SAUSALITO, CALIFORNIA  
101.7 MHz / 0.250 kW DA**

**IHR EDUCATIONAL BROADCASTING**

**DECEMBER, 2013**

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**JEREMY RUCK & ASSOCIATES, INC.**

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

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jeremyruck.com

**12.17.2013**

## **APPLICATION FOR CONSTRUCTION PERMIT**

The following engineering statement and attached exhibits have been prepared for **IHR Educational Broadcasting** ("IHR"), licensee of FM translator station K269FB at Sausalito, California, and are in support of their application for construction permit to modify that facility.<sup>1</sup>

This application seeks to relocate the facility from its current licensed location. As part of the relocation, the technical parameters associated with the facility would necessarily change. This change is being proposed due to less than optimal performance of the translator from its current licensed location to its intended coverage area.

The proposed facility would operate with a maximum effective radiated power of 250 Watts at a center of radiation of 146.7 meters AMSL. In order to provide the requisite protection to other facilities in the region, a directional antenna would continue to be employed. At present, the facility utilizes a custom Kathrein-Scala directional array. The proposed facility would change to the use of a single Kathrein-Scala HDCA-5CP/RM Yagi style antenna oriented at an azimuth of 310 degrees true. The interference situation to several of the other facilities in the region would be considered under simple contour overlap pursuant to Section 74.1204 of the Commission's Rules. To others, a more complex approach is required, thus several facilities will be considered pursuant to Section 74.1204(d).

The proposed facility would continue to serve as a fill-in translator for AM station KSFB at San Francisco, California.<sup>2</sup> KSFB is also licensed to IHR. Exhibit E-1 illustrates the proposed 60

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<sup>1</sup> The Facility ID for K269FB at Sausalito, California is 147348.

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dBu service contour of KSFB along with the 2.0 mV/m daytime service contour for that facility, and a twenty-five mile site radius centered on the KSFB transmitter site. As this exhibit demonstrates, the predicted 60 dBu service contour of the translator would be wholly contained within both of these additional constructs.

The proposed relocation of the translator would constitute a minor change to the facility. There is no change in the channel of operation. In addition, the change in location would result in overlap between the licensed 60 dBu service contour and the proposed 60 dBu service contour. Exhibit E-2 illustrates both the proposed and licensed 60 dBu service contours for K269FB. As this map demonstrates, there would be a large area of overlap between the two contours.

The proposed facility complies with the provisions of Section 74.1204 of the Commission's Rules to relevant facilities in the region. Section 74.1205 is not applicable to the facility due to the channel of operation. As previously mentioned, demonstration of compliance with the interference standards within the Commission's Rules will be accomplished through a contour overlap study, as well as additional 74.1204(d) studies.

Exhibit E-3 is a tabular allocation study for the proposed K269FB facility. This tabulation demonstrates that the proposed facility would comply with the contour overlap provisions of the Commission's Rules to all facilities with the exception of KIOI(FM) and KUZX(FM), both at San Francisco, California, KHTH(FM) at Santa Rosa, California, and KUZX-FM2 at San Francisco, California. This tabular allocation study is graphically depicted in the contour map in Exhibit E-4, with Exhibit E-5 illustrating greater detail in the vicinity of the Bay area.

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<sup>2</sup> The Facility ID for KSFB at San Francisco, California is 6369.

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The first two facilities to be considered pursuant to Section 74.1204(d) of the Commission's Rules are KIOI(FM) and KUZX(FM), both licensed to San Francisco. Exhibit E-6 illustrates the proposed translator site along with the KUZX 98.3 dBu service contour and the KIOI 97.5 dBu service contour. As this map demonstrates, both of these contours intersect the proposed translator site.

Both KIOI and KUZX are authorized to operate on channels second adjacent to that of K269FB. As a result of this frequency separation, interference to either full power facility would potentially occur in regions where the translator field strength is at least 40 dB higher than the field strength of the full power facility under consideration. Specifically interference to KIOI may occur in regions where the translator field strength is at least 137.5 dBu and to KUZX where the K269FB field strength is at least 138.3 dBu. Since the former limit is the lesser, and therefore more restrictive, of the two limits, its value will be utilized.

The power density for the proposed facility at the interfering field strength is given by the following equation:

$$S = \frac{E^2}{Z_0}$$

In this equation, S represents the calculated power density in Watts per square meter, E is the electric field intensity, and Z<sub>0</sub> is the characteristic impedance of free space of 377 ohms.

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The power density is also given by:

$$S = \frac{P}{4\pi R^2}$$

Where S is the same units, P is the power in Watts, and R is the distance. Rearranging the terms in the equation, it can be solved for the distance to the desired power density as follows:

$$R^2 = \frac{P}{4\pi S}$$

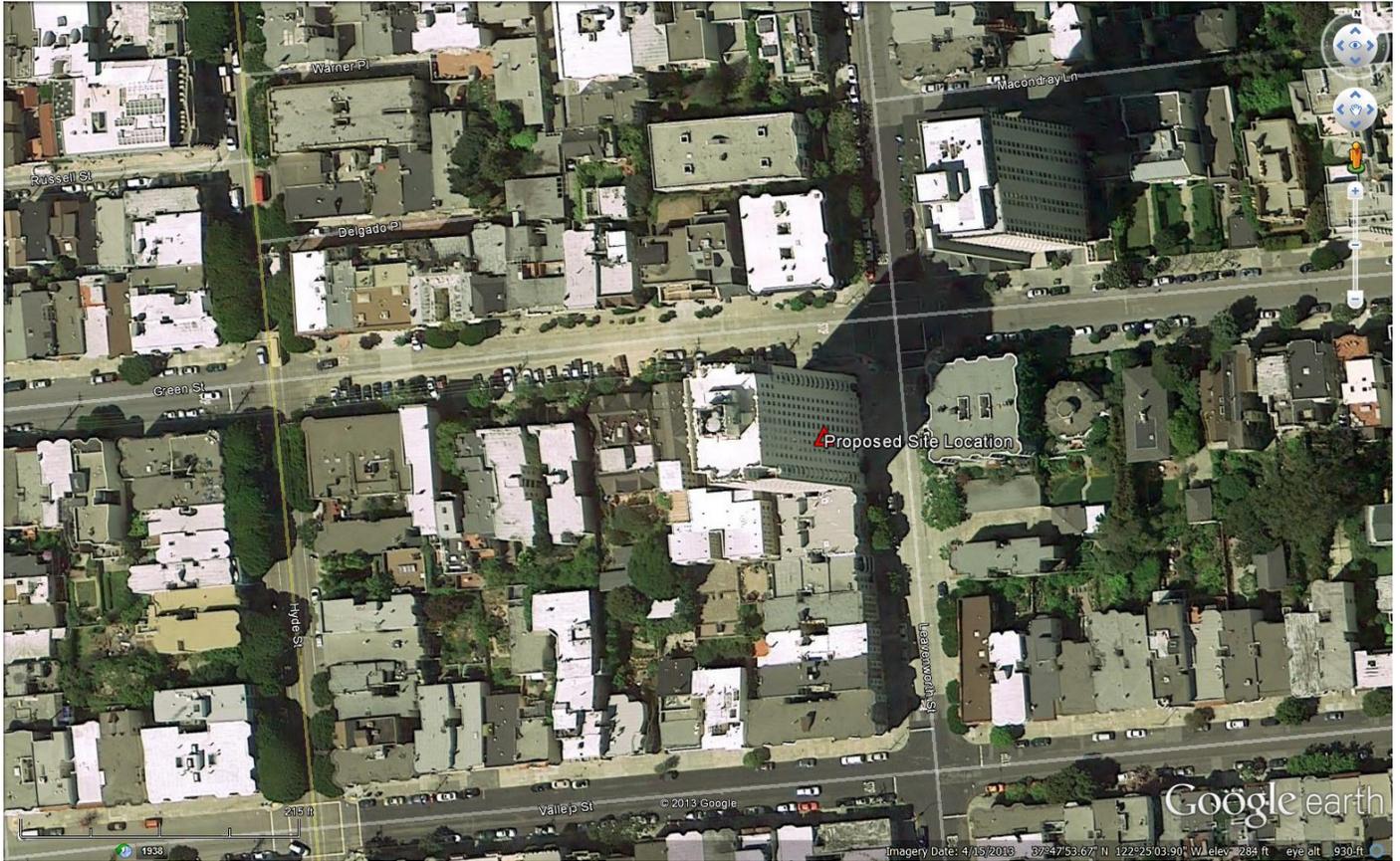
The results of these calculations for depression angles of 0 degrees to 90 degrees are tabulated in Exhibit E-7. In addition to the tabular data in that exhibit, Exhibit E-7 also provides several graphs illustrating the calculated interference information. The calculations in this exhibit assume the maximum ERP occurs at all azimuths.

As the form pages indicate, the center of radiation is located at 62 meters above ground level. The data in Exhibit E-7 demonstrate that the closest approach to the site elevation of the interference region exists at 56.6 meters AGL, or 5.4 meters below the antenna. The following satellite image illustrates the structure on which the antenna would be mounted.

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This image demonstrates that the supporting structure would be a hi-rise residential building. Due to the angle at which the overhead image was acquired, a circle cannot be easily drawn on the image to illustrate the interference radius with accuracy. However, it can be reasonably inferred from this image that the interference region would not reach the ground, or any populated area.

To the northeast of this structure across the intersection of Green and Leavenworth streets is another high-rise structure of similar height. This building is, however, located at a distance of approximately 50 meters from the base of the tower supporting the antenna. Since the tabulation in Exhibit E-7 lists a maximum distance to the interference region of 14.8 meters at any depression angle, it is respectfully submitted that this building will not experience the interference region. The

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**6**

following image illustrates the building on which the translator antenna would be mounted from a street level perspective looking northward.



This image demonstrates that the structure on which the antenna would be mounted is substantially higher than all surrounding buildings, especially the building to the northeast previously referenced. The antenna would be mounted essentially at rooftop level pointing at an azimuth of 310 degrees true. Because of this location, and the minimal distance from the antenna at high depression angles, any occupied areas of the building would similarly be unaffected by the potential interference region.

The next facility under consideration is the on-channel booster for KUZX-FM2 licensed to San Francisco. In the case of this facility, interference to be considered would be limited to areas

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within the 54 dBu service contour of the booster where the K269FB field strength is at least 40 dB greater than the booster.<sup>3</sup> Exhibit E-8 demonstrates that by the FCC contour methodology, the KUZX-FM2 field strength in the vicinity of the translator is 63 dBu. Thus, interference to the booster may occur in regions where the translator field strength is 103 dBu or greater.

The booster, however, operates co-channel to KUZX, which in Exhibit E-6 was demonstrated to have a field strength of 98.3 dBu in the vicinity of the proposed K269FB transmitter site. Since the co-channel interference definition is a -20 dB U/D ratio, it can be reasonably inferred that in the immediate vicinity of the proposed K269FB site, the interference to the reception of KUZX-FM2 will be dominated by KUZX(FM), such that K269FB would not be a factor.

Exhibits E-3 and E-4 demonstrated that predicted contour overlap would occur between K269FB and KHTH(FM) at Santa Rosa, California, and also between K269FB and KHTH-FM1 at Petaluma, California. This predicted contour overlap is a result of the mechanics of the Commission's standard contour methodology. However, in practice, interference is not predicted to occur to either KHTH(FM) or KHTH-FM1 from K269FB.

Exhibit E-9 illustrates the proposed K269FB 37 dBu F(50,10) contour along with the 57 dBu service contours of both KHTH and KHTH-FM1. As this map demonstrates, the arc across which overlap by the Commission's standard method is predicted to occur spans azimuths of 312 degrees true to 349 degrees true. The following image illustrates a perspective shot from the area

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<sup>3</sup> The 54 dBu service contour for the booster is being considered, as the primary station, KUZX(FM), is a class B facility.

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in the vicinity of the proposed K269FB transmitter site looking northwest in the direction of the predicted overlap area.

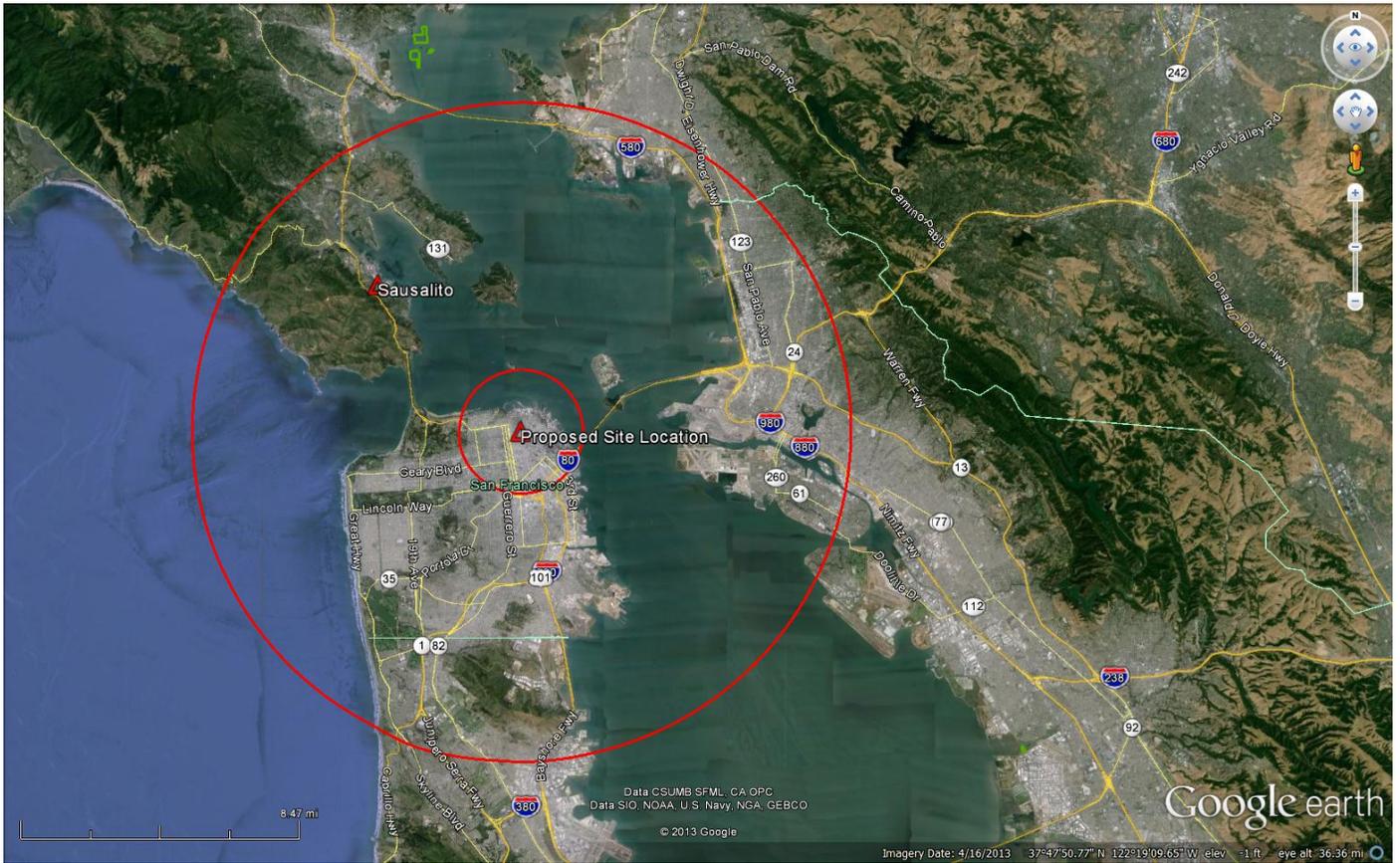


This image illustrates that there are substantial variations in the terrain in those directions. The following satellite image illustrates the location of the proposed K269FB site, along with two circles. These radii of these circles are 3 kilometers and 16 kilometers. These represent the range over which terrain is averaged to determine the contour distances.

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Across the range of azimuths of interest, it is clear that the majority of the sampled elevation points used to determine the distance to the 37 dBu F(50,10) contour from the proposed K269FB site occur over the Bay. Across the Bay, the terrain rises rapidly; however, the greatest elevations do not occur until areas *beyond* the 16 kilometer sample radius. As a result, the elevations at mean sea level plus the lack of sampling of the terrain beyond the 16 kilometer radius are skewing the predicted distance to the 37 dBu F(50,10) contour, and are making it appear *larger* than it would be in practice.<sup>4</sup>

<sup>4</sup> For a qualitative analysis the "notch" in the 37 dBu F(50,10) contour in Exhibit E-9 counterclockwise from the 312 degree true azimuth radial is a practical extent to which the 37 dBu contour would be expected to travel, as much of the declivitous terrain north of the Golden Gate would be sampled along this radial. Nevertheless, the distance to the contour along these azimuths is overstated.

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The table in Exhibit E-10 summarizes the predicted distance to the 37 dBu F(50,10) interfering contour from the proposed K269FB site. As was the case with all FM band contours in this application, 3-second linearly interpolated terrain was utilized due to terrain irregularities. Exhibit E-11, then utilizes the map in Exhibit E-9, but adds an additional dashed green circle. This green circle, which has a radius of 40 kilometers centered on the proposed K269FB site demonstrates that any region of contour overlap between K269FB and either KHTH or KHTH-FM1 exists at a distance of *at least* 40 kilometers from the proposed K269FB site.

Exhibit E-12 provides terrain profile graphs across the arc of predicted contour overlap. Specifically, a profile graph was drawn every one degree of azimuth from 312 degrees true to 349 degrees true. These graphs correspond to the radials tabulated in Exhibit E-10, and the endpoint of each graph is at the predicted distance to the 37 dBu contour by the Commission's standard method as tabulated in Exhibit E-109.

These profiles demonstrate that along each azimuth, significant and substantial terrain obstructions exist at a distance much less than 40 kilometers distant from the proposed K269FB site. Since these obstructions occur at distances *less* than 40 kilometers from the K269FB site, it can reasonably be inferred that the 37 dBu F(50,10) contour cannot exist at a distance of 40 kilometers from the K269FB site. Since 40 kilometers is the closest point at which any predicted contour overlap would occur, and no overlap would occur here due to intervening terrain, it can be concluded that overlap would not occur on *any* azimuth across the arc of consideration due to the intervening terrain. As a result, the proposed K269FB facility would not be predicted to cause interference to either KHTH or KHTH-FM1.

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The proposed facility is exempt from environmental processing, as it would not constitute a substantial environmental impact. The proposed facility would utilize the rooftop of an existing building that is also registered as an antenna structure with the Commission. The addition of the K269FB antenna to this building would not increase the existing environmental impact from its presence.

In addition, the proposed facility would not constitute an RF exposure hazard to persons in the vicinity. Under a worst case scenario, the predicted power density at 2 meters above ground level would be  $4.96 \mu\text{W}/\text{cm}^2$ . This value is considerably less than the uncontrolled environment condition of the applicable safety standard. At the roof level, which is a controlled environment, the controlled environment condition of the safety standard may be exceeded at distances less than 4.0 meters from the proposed antenna. IHR certifies that it will coordinate with other users of the site, including building personnel, and reduce power or cease operation as necessary to protect workers in the vicinity of the antenna.

The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature  
License Expires November 30, 2015

Jeremy D. Ruck, PE  
December 17, 2013

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**K269FB.X**  
BLFT20120410AEF  
Latitude: 37-47-54.30 N  
Longitude: 122-24-59.10 W  
ERP: 0.25 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 146.7 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

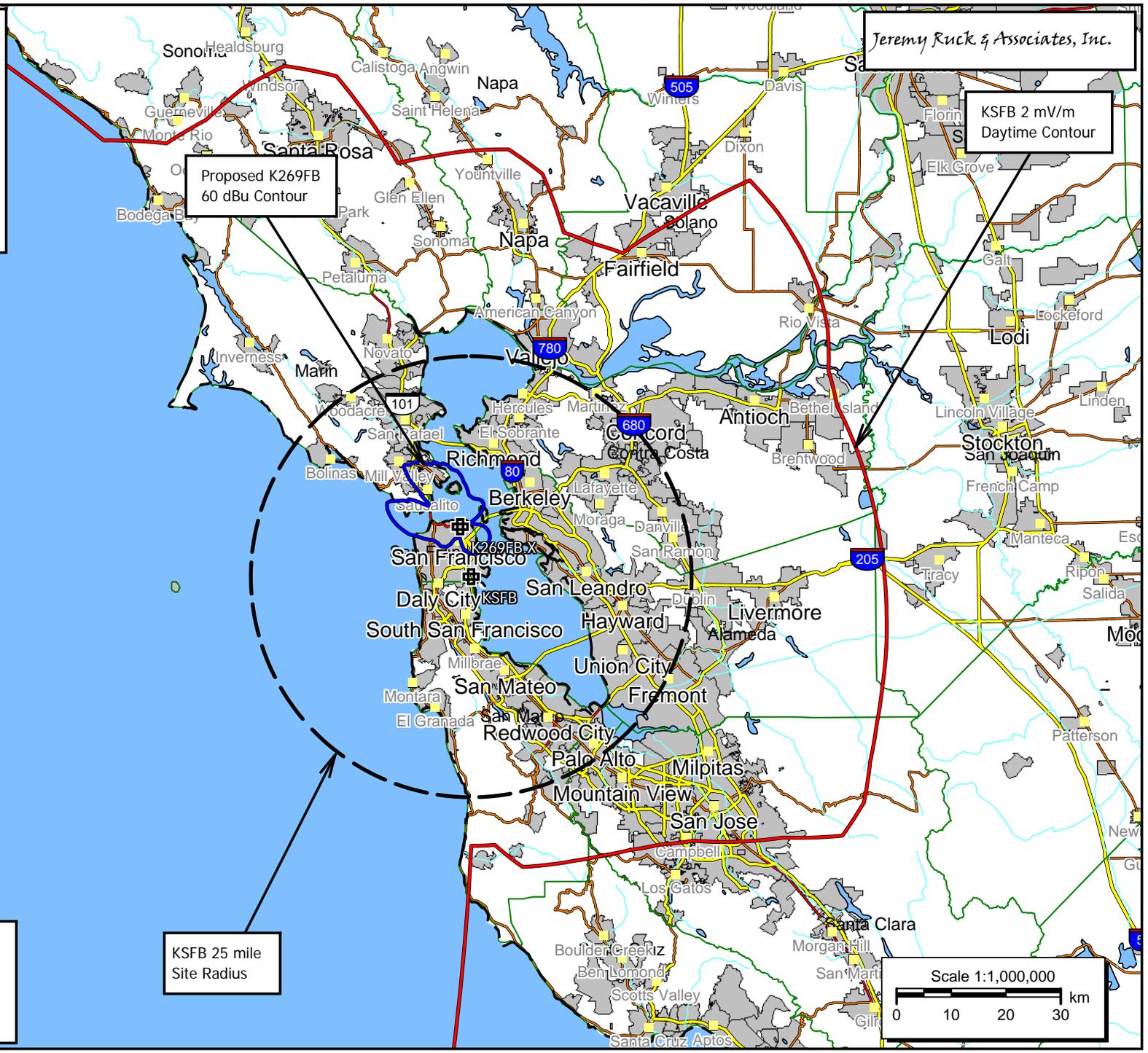
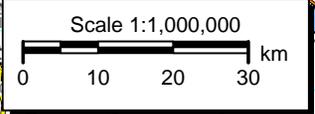
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KSFB 2 mV/m  
Daytime Contour

Proposed K269FB  
60 dBu Contour

KSFB 25 mile  
Site Radius

Exhibit E-1  
Service Contour Comparison  
K269FB - Sausalito, California  
IHR Educational Broadcasting  
December, 2013



**K269FB.X**  
BLFT20120410AEF  
Latitude: 37-47-54.30 N  
Longitude: 122-24-59.10 W  
ERP: 0.25 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 146.7 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

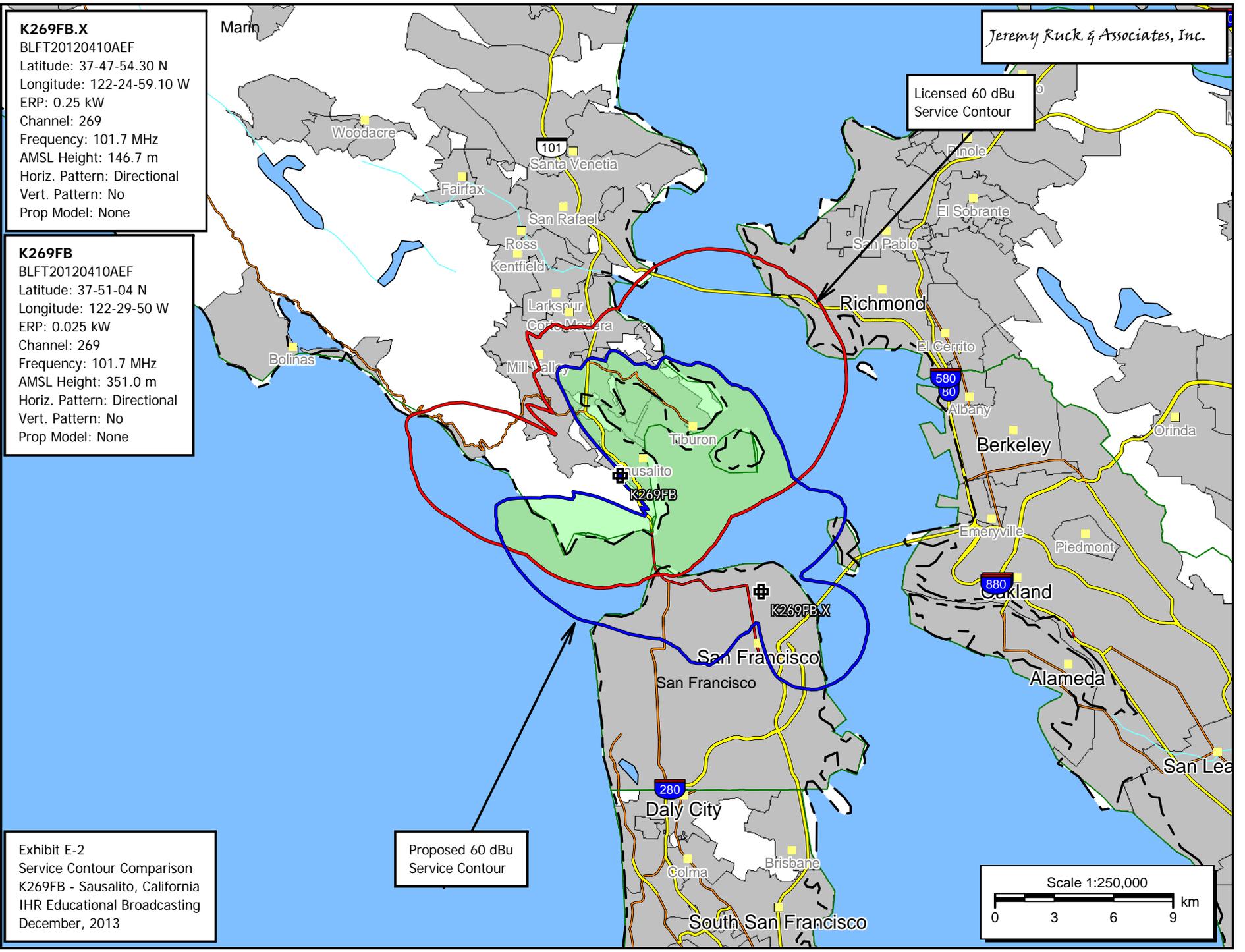
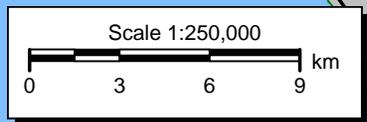
**K269FB**  
BLFT20120410AEF  
Latitude: 37-51-04 N  
Longitude: 122-29-50 W  
ERP: 0.025 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 351.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

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Licensed 60 dBu  
Service Contour

Proposed 60 dBu  
Service Contour

Exhibit E-2  
Service Contour Comparison  
K269FB - Sausalito, California  
IHR Educational Broadcasting  
December, 2013



Jeremy Ruck & Associates, Inc.  
Consulting Engineers - Canton, Illinois

Exhibit E-3 - Tabular Allocation Study  
K269FB - Sausalito, California  
CH# 269D - 101.7 MHz, Pwr= 0.25 kW DA, HAAT= 120.4 M, COR= 146.7 M  
Average Protected F(50-50)= 14.09 km  
Standard Directional

REFERENCE  
37 47 54.3 N.  
122 24 59.1 W.

DISPLAY DATES  
DATA 12-17-13  
SEARCH 12-17-13

CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
267B San Francisco	KIOI	LIC DCN CA		188.5 8.5	12.18 BLH6225	37 41 24.0 122 26 13.0	125.000 354	10.6 418	89.6 Amfm Broadcasting	-3.8	-77.5*
271B San Francisco	KUZX	LIC _CX CA		309.3 129.3	9.20 BMLH20120530ALA	37 51 03.0 122 29 51.0	33.000 319	8.1 386	80.5 Entercom License, LIc	-8.3*	-72.9*
269A Livermore	KKIQ	LIC _CN CA		108.6 289.0	70.14 BMLH19900130KA	37 35 42.0 121 39 42.0	4.500 116	119.6 631	48.3 Kkiq, Inc.	-55.1*	3.0
269D Sausalito	K269FB	LIC DC_ CA		309.6 129.5	9.20 BLFT20120410AEF	37 51 04.0 122 29 50.0	0.025 306	21.9 351	5.9 Ihr Educational Broadcasti	-21.9*	-46.8
269B1 Santa Rosa	KHTH	LIC ZCN CA		344.9 164.7	81.81 BLH19920818KG	38 30 31.0 122 39 41.0	2.200 332	95.5 546	37.9 Amaturo Sonoma Media Group	-26.9*	-14.6
271D San Francisco	KUZX-FM2	LIC DV_ CA		77.9 258.2	44.72 BLFTB20060209AAG	37 52 54.0 121 55 05.0	1.000 1122	2.0 1122	52.0 Entercom License, LIc	37.8	-7.3*
269D Petaluma	KHTH-FM1	LIC DCN CA		345.3 165.2	61.37 BLFTB19930712TD	38 19 56.0 122 35 42.0	0.045 400	54.2 579	13.5 Amaturo Sonoma Media Group	-5.8	2.1
269D Hayward	KKIQ-FM1	LIC DV_ CA		114.3 294.5	32.20 BLFTB20130625AAO	37 40 43.4 122 04 58.4	0.600 1122	29.1 71	7.1 Kkiq, Inc.	1.2	4.3
216B1 San Mateo	KCSM	LIC _CX CA		165.9 346.0	30.12 BLED20100921ACN	37 32 08.1 122 20 00.0	11.000 113	12.0 225	82.5 San Mateo County Communi ty	11.5R	18.6M
267D Walnut Creek	KIOI-FM1	LIC DVN CA		59.9 240.1	29.81 BLFTB19990225UC	37 55 57.0 122 07 20.0	0.150 300	0.0 427	3.5 Amfm Broadcasting Li censes	24.0	25.4
267D Pleasanton	KIOI-FM2	LIC DVN CA		109.8 290.1	45.34 BLFTB19990225UB	37 39 34.0 121 55 54.0	0.900 1122	0.1 543	9.0 Amfm Broadcasti ng Li censes	39.4	33.7
269D Tracy	KKIQ-FM2	LIC DCN CA		90.9 271.5	92.81 BLFTB19930614TA	37 46 52.0 121 21 37.0	1.200 85	53.4 101	15.5 Kkiq, Inc.	34.1	60.8
269A Carmel	KCDU	LIC _CN CA		157.9 338.3	149.28 BLH19941228KG	36 33 09.0 121 47 17.0	2.350 161	101.0 387	39.6 Mapleton License Of Monter	42.6	92.3

Terrain database is NED 03 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM  
In & Out distances between contours are shown at closest points. Reference zone= East Zone 2A, Co to 3rd adjacent.  
All separation margins (if shown) include rounding  
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polari zation (C,H,V,E), Beamtil t(Y,N,X)  
"\*"affixed to 'IN' or 'OUT' values = site inside protected contour.

**K269FB.X**  
 BLFT20120410AEF  
 Latitude: 37-47-54.30 N  
 Longitude: 122-24-59.10 W  
 ERP: 0.25 kW  
 Channel: 269  
 Frequency: 101.7 MHz  
 AMSL Height: 146.7 m  
 Horiz. Pattern: Directional  
 Vert. Pattern: No  
 Prop Model: None

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- 60 dBu F(50,50) Service Contour
- 57 dBu F(50,50) Service Contour
- 54 dBu F(50,50) Service Contour
- 94 dBu F(50,10) Interference Contour
- 40 dBu F(50,10) Interference Contour
- 37 dBu F(50,10) Interference Contour

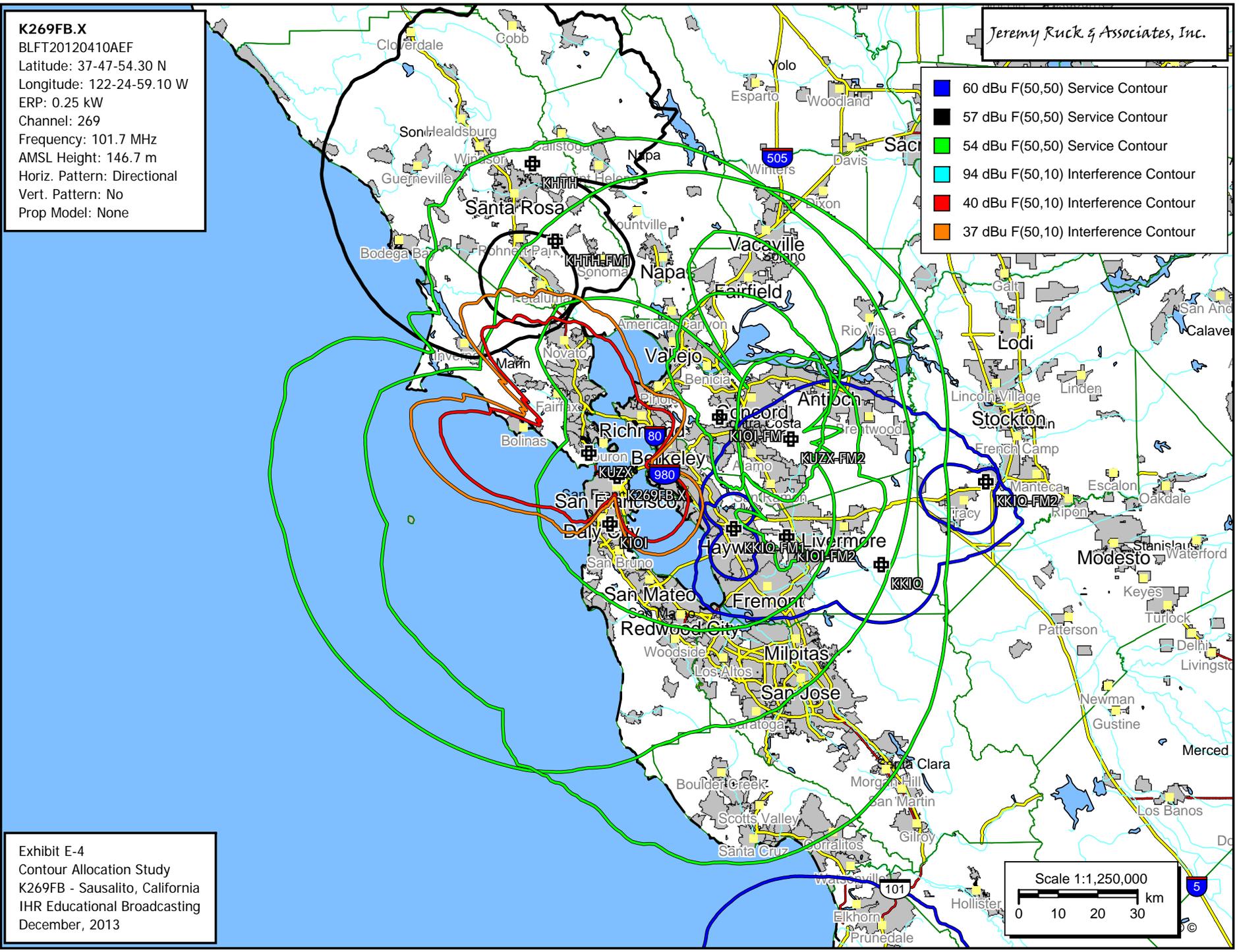


Exhibit E-4  
 Contour Allocation Study  
 K269FB - Sausalito, California  
 IHR Educational Broadcasting  
 December, 2013



**K269FB.X**  
BLFT20120410AEF  
Latitude: 37-47-54.30 N  
Longitude: 122-24-59.10 W  
ERP: 0.25 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 146.7 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

*Jeremy Ruck & Associates, Inc.*

- 60 dBu F(50,50) Service Contour
- 57 dBu F(50,50) Service Contour
- 54 dBu F(50,50) Service Contour
- 94 dBu F(50,10) Interference Contour
- 40 dBu F(50,10) Interference Contour
- 37 dBu F(50,10) Interference Contour

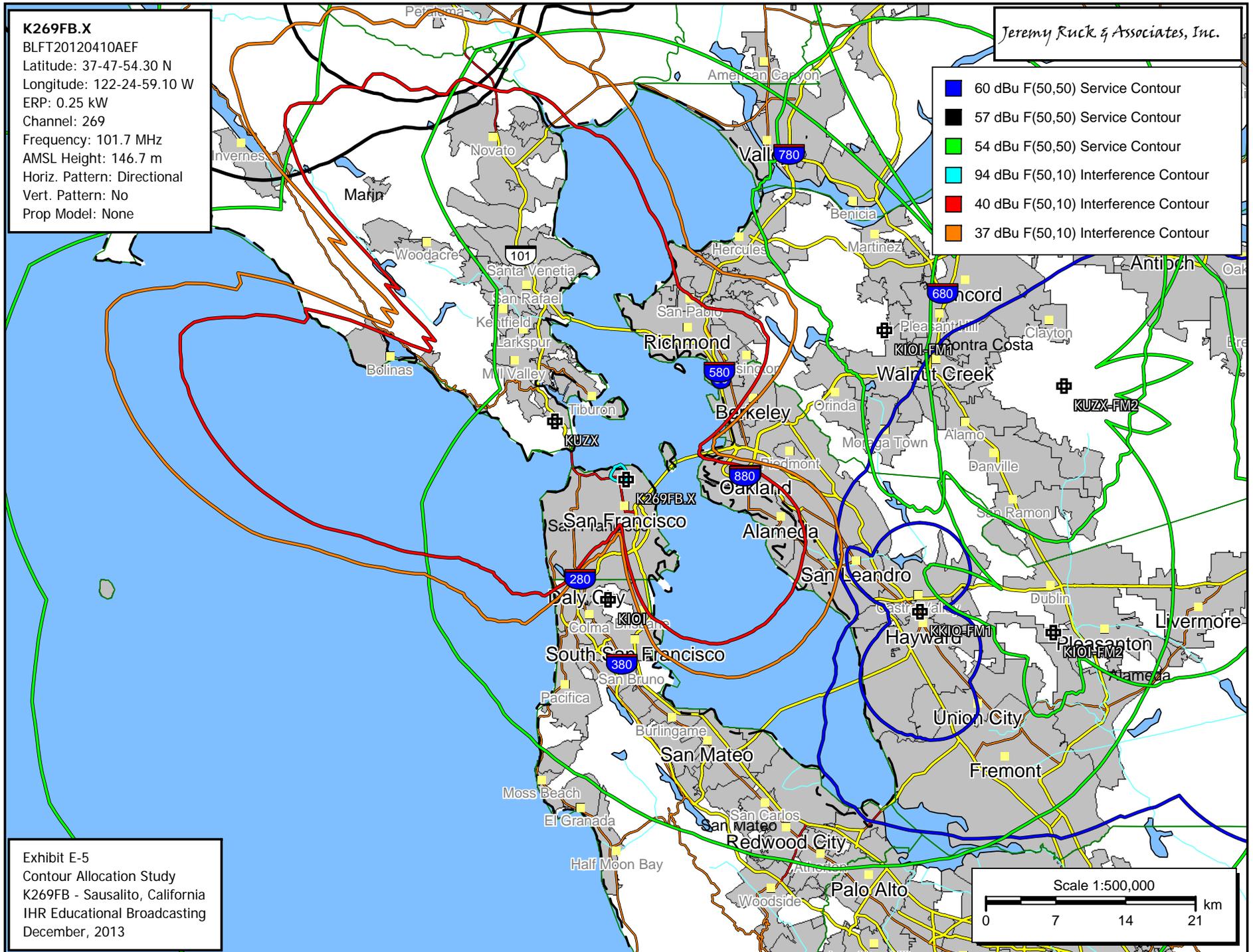


Exhibit E-5  
Contour Allocation Study  
K269FB - Sausalito, California  
IHR Educational Broadcasting  
December, 2013



**K269FB.X**

BLFT20120410AEF  
Latitude: 37-47-54.30 N  
Longitude: 122-24-59.10 W  
ERP: 0.25 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 146.7 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**K10I**

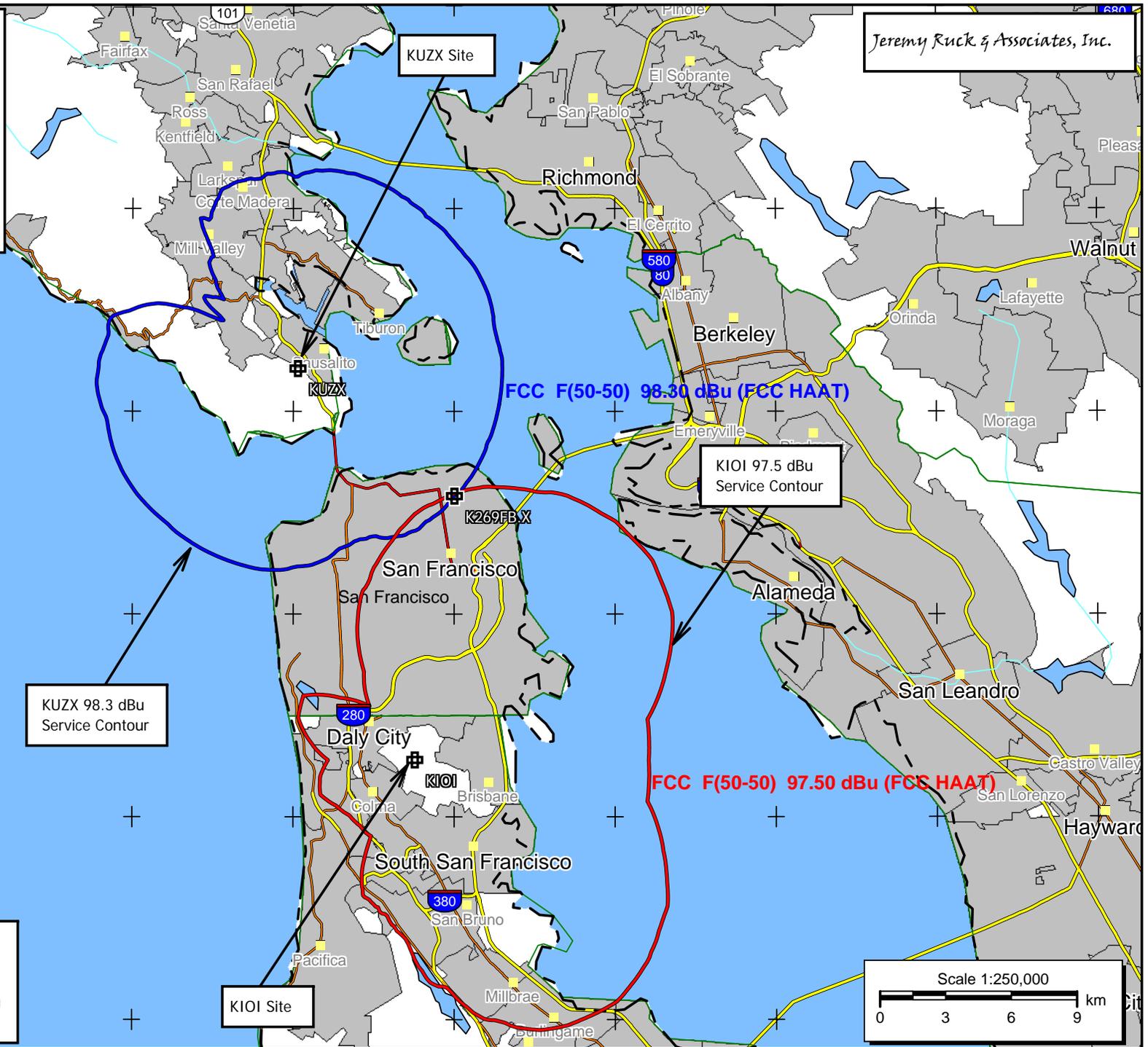
BLH6225  
Latitude: 37-41-24 N  
Longitude: 122-26-13 W  
ERP: 125.00 kW  
Channel: 267  
Frequency: 101.3 MHz  
AMSL Height: 418.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**KUZX**

BMLH20120530ALA  
Latitude: 37-51-03 N  
Longitude: 122-29-51 W  
ERP: 33.00 kW  
Channel: 271  
Frequency: 102.1 MHz  
AMSL Height: 386.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: None

Exhibit E-6  
Interference Study  
K269FB - Sausalito, California  
IHR Educational Broadcasting  
December, 2013

Jeremy Ruck & Associates, Inc.

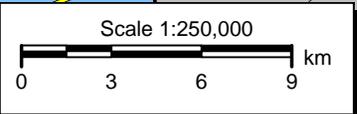


KUZX 98.3 dBu  
Service Contour

K10I 97.5 dBu  
Service Contour

FCC F(50-50) 98.30 dBu (FCC HAAT)

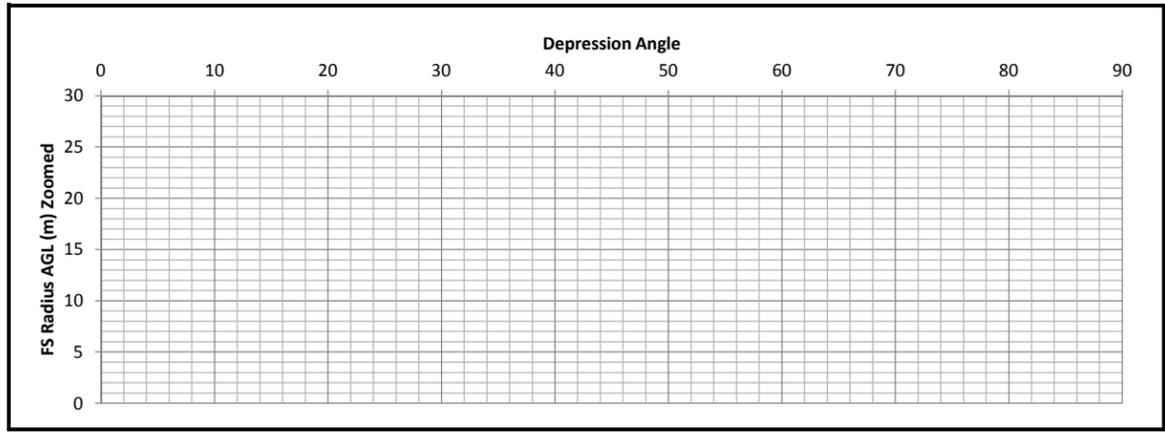
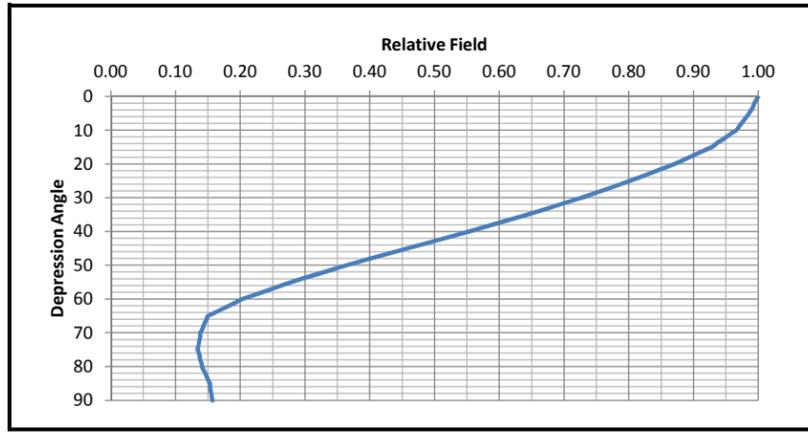
FCC F(50-50) 97.50 dBu (FCC HAAT)



Scale 1:250,000

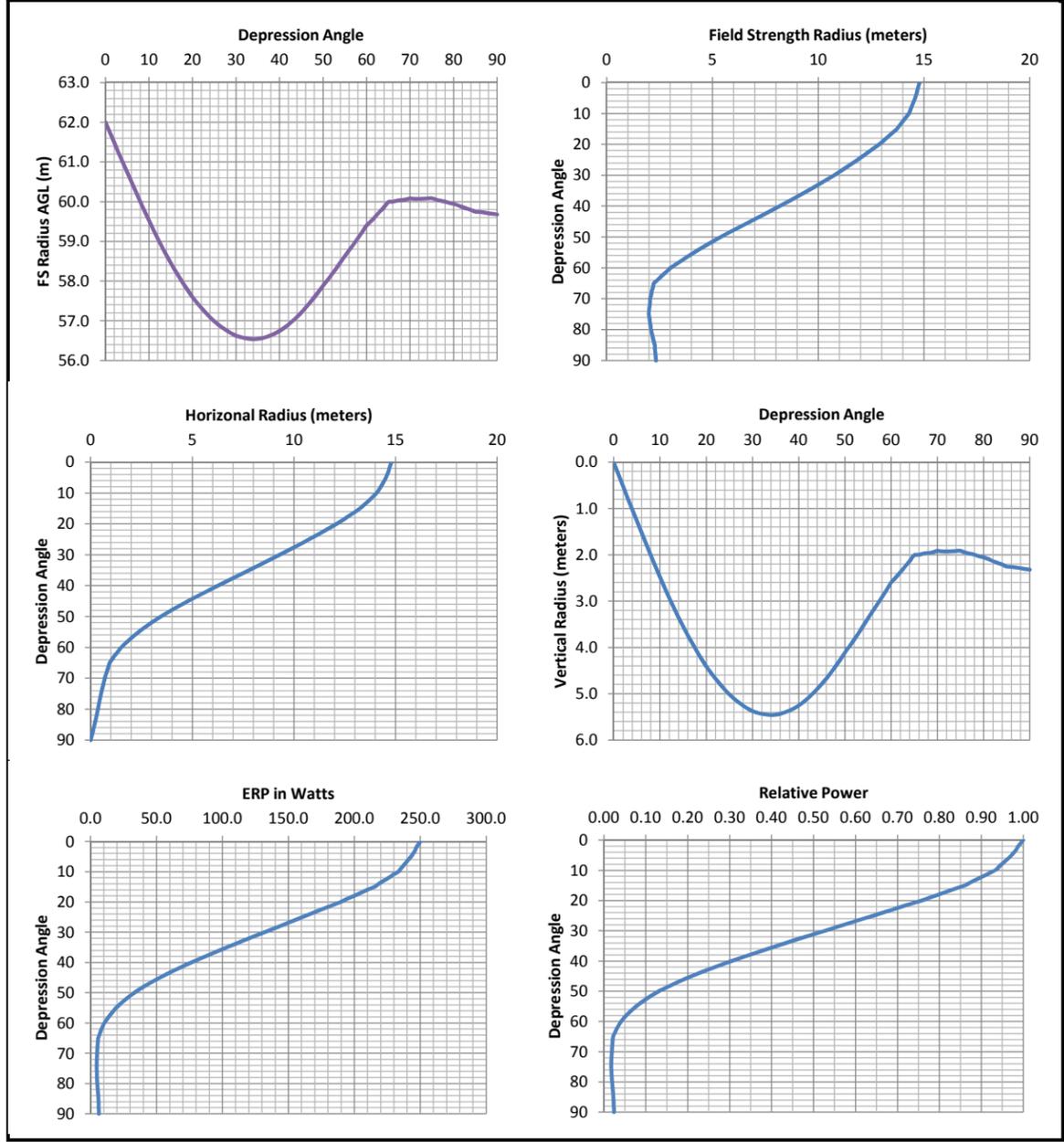
**Exhibit E-7**  
**Proximity Interference Analysis**  
 K269FB - Sausalito, California

Antenna No:	68	Center of Radiation:	62 m AGL
Manufacturer:	Scala	Effective Radiated Power:	250 Watts
Model:	HDCA-SCP	FS Contour:	137.5 dBu
Number of Bays:	N/A	E Field Strength:	7.49894 V/m
Bay Spacing:	Log	Z0 (Ohms):	377 Ohms
		Power Density:	0.149162155 W/m <sup>2</sup>



Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
0	1.0000	1.0000	250.00	14.79	14.79	0.00	62.00
1	0.9970	0.9940	248.50	14.75	14.74	0.26	61.74
2	0.9940	0.9880	247.01	14.70	14.69	0.51	61.49
3	0.9920	0.9841	246.02	14.67	14.65	0.77	61.23
4	0.9890	0.9781	244.53	14.63	14.59	1.02	60.98
5	0.9860	0.9722	243.05	14.58	14.53	1.27	60.73
6	0.9820	0.9643	241.08	14.52	14.44	1.52	60.48
7	0.9780	0.9565	239.12	14.46	14.36	1.76	60.24
8	0.9740	0.9487	237.17	14.41	14.26	2.00	60.00
9	0.9700	0.9409	235.23	14.35	14.17	2.24	59.76
10	0.9660	0.9332	233.29	14.29	14.07	2.48	59.52
11	0.9580	0.9178	229.44	14.17	13.91	2.70	59.30
12	0.9510	0.9044	226.10	14.06	13.76	2.92	59.08
13	0.9430	0.8892	222.31	13.95	13.59	3.14	58.86
14	0.9350	0.8742	218.56	13.83	13.42	3.35	58.65
15	0.9280	0.8612	215.30	13.72	13.26	3.55	58.45
16	0.9160	0.8391	209.76	13.55	13.02	3.73	58.27
17	0.9050	0.8190	204.76	13.38	12.80	3.91	58.09
18	0.8940	0.7992	199.81	13.22	12.57	4.09	57.91
19	0.8820	0.7779	194.48	13.04	12.33	4.25	57.75
20	0.8710	0.7586	189.66	12.88	12.10	4.41	57.59
21	0.8570	0.7344	183.61	12.67	11.83	4.54	57.46
22	0.8430	0.7106	177.66	12.47	11.56	4.67	57.33
23	0.8300	0.6889	172.23	12.28	11.30	4.80	57.20
24	0.8160	0.6659	166.46	12.07	11.02	4.91	57.09
25	0.8020	0.6432	160.80	11.86	10.75	5.01	56.99
26	0.7870	0.6194	154.84	11.64	10.46	5.10	56.90
27	0.7720	0.5960	149.00	11.42	10.17	5.18	56.82
28	0.7570	0.5730	143.26	11.20	9.89	5.26	56.74
29	0.7420	0.5506	137.64	10.97	9.60	5.32	56.68
30	0.7270	0.5285	132.13	10.75	9.31	5.38	56.62
31	0.7100	0.5041	126.03	10.50	9.00	5.41	56.59
32	0.6930	0.4802	120.06	10.25	8.69	5.43	56.57
33	0.6770	0.4583	114.58	10.01	8.40	5.45	56.55
34	0.6600	0.4356	108.90	9.76	8.09	5.46	56.54
35	0.6430	0.4134	103.36	9.51	7.79	5.45	56.55
36	0.6250	0.3906	97.66	9.24	7.48	5.43	56.57
37	0.6070	0.3684	92.11	8.98	7.17	5.40	56.60
38	0.5890	0.3469	86.73	8.71	6.86	5.36	56.64
39	0.5710	0.3260	81.51	8.44	6.56	5.31	56.69
40	0.5530	0.3058	76.45	8.18	6.27	5.26	56.74
41	0.5340	0.2852	71.29	7.90	5.96	5.18	56.82
42	0.5150	0.2652	66.31	7.62	5.66	5.10	56.90
43	0.4960	0.2460	61.50	7.34	5.36	5.00	57.00
44	0.4770	0.2275	56.88	7.05	5.07	4.90	57.10
45	0.4580	0.2098	52.44	6.77	4.79	4.79	57.21

Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	0.4580	0.2098	52.44	6.77	4.79	4.79	57.21
46	0.4390	0.1927	48.18	6.49	4.51	4.67	57.33
47	0.4200	0.1764	44.10	6.21	4.24	4.54	57.46
48	0.4010	0.1608	40.20	5.93	3.97	4.41	57.59
49	0.3820	0.1459	36.48	5.65	3.71	4.26	57.74
50	0.3630	0.1318	32.94	5.37	3.45	4.11	57.89
51	0.3460	0.1197	29.93	5.12	3.22	3.98	58.02
52	0.3290	0.1082	27.06	4.87	3.00	3.83	58.17
53	0.3120	0.0973	24.34	4.61	2.78	3.69	58.31
54	0.2950	0.0870	21.76	4.36	2.56	3.53	58.47
55	0.2780	0.0773	19.32	4.11	2.36	3.37	58.63
56	0.2630	0.0692	17.29	3.89	2.18	3.22	58.78
57	0.2480	0.0615	15.38	3.67	2.00	3.08	58.92
58	0.2330	0.0543	13.57	3.45	1.83	2.92	59.08
59	0.2180	0.0475	11.88	3.22	1.66	2.76	59.24
60	0.2030	0.0412	10.30	3.00	1.50	2.60	59.40
61	0.1930	0.0372	9.31	2.85	1.38	2.50	59.50
62	0.1820	0.0331	8.28	2.69	1.26	2.38	59.62
63	0.1710	0.0292	7.31	2.53	1.15	2.25	59.75
64	0.1610	0.0259	6.48	2.38	1.04	2.14	59.86
65	0.1500	0.0225	5.63	2.22	0.94	2.01	59.99
66	0.1480	0.0219	5.48	2.19	0.89	2.00	60.00
67	0.1450	0.0210	5.26	2.14	0.84	1.97	60.03
68	0.1430	0.0204	5.11	2.11	0.79	1.96	60.04
69	0.1410	0.0199	4.97	2.09	0.75	1.95	60.05
70	0.1380	0.0190	4.76	2.04	0.70	1.92	60.08
71	0.1380	0.0190	4.76	2.04	0.66	1.93	60.07
72	0.1370	0.0188	4.69	2.03	0.63	1.93	60.07
73	0.1360	0.0185	4.62	2.01	0.59	1.92	60.08
74	0.1350	0.0182	4.56	2.00	0.55	1.92	60.08
75	0.1340	0.0180	4.49	1.98	0.51	1.91	60.09
76	0.1360	0.0185	4.62	2.01	0.49	1.95	60.05
77	0.1370	0.0188	4.69	2.03	0.46	1.97	60.03
78	0.1380	0.0190	4.76	2.04	0.42	2.00	60.00
79	0.1400	0.0196	4.90	2.07	0.40	2.03	59.97
80	0.1410	0.0199	4.97	2.09	0.36	2.05	59.95
81	0.1430	0.0204	5.11	2.11	0.33	2.09	59.91
82	0.1460	0.0213	5.33	2.16	0.30	2.14	59.86
83	0.1480	0.0219	5.48	2.19	0.27	2.17	59.83
84	0.1500	0.0225	5.63	2.22	0.23	2.21	59.79
85	0.1530	0.0234	5.85	2.26	0.20	2.25	59.75
86	0.1530	0.0234	5.85	2.26	0.16	2.26	59.74
87	0.1540	0.0237	5.93	2.28	0.12	2.27	59.73
88	0.1550	0.0240	6.01	2.29	0.08	2.29	59.71
89	0.1560	0.0243	6.08	2.31	0.04	2.31	59.69
90	0.1570	0.0246	6.16	2.32	0.00	2.32	59.68



**K269FB.X**

BLFT20120410AEF  
Latitude: 37-47-54.30 N  
Longitude: 122-24-59.10 W  
ERP: 0.25 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 146.7 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**KUZX-FM2**

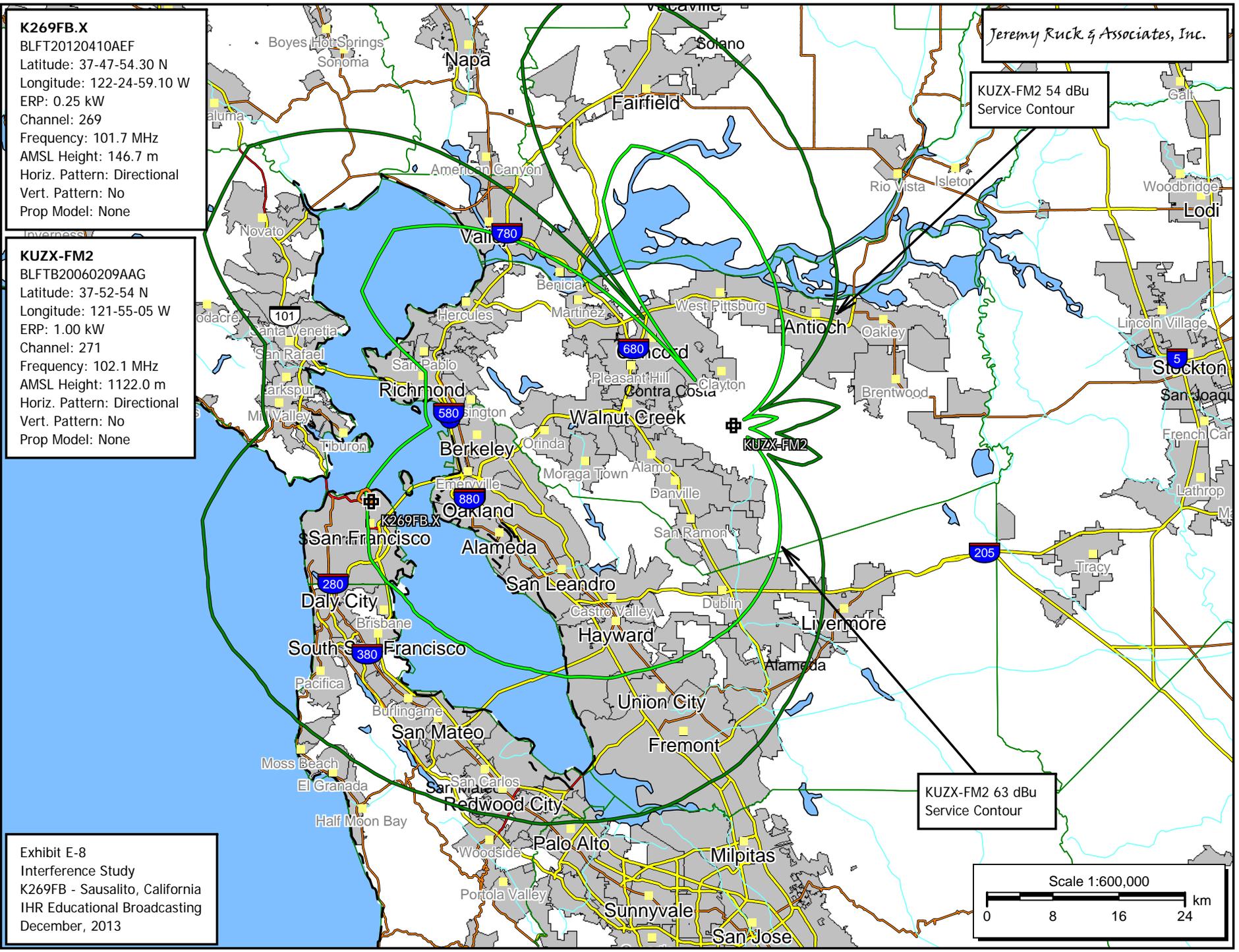
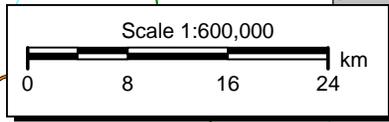
BLFTB20060209AAG  
Latitude: 37-52-54 N  
Longitude: 121-55-05 W  
ERP: 1.00 kW  
Channel: 271  
Frequency: 102.1 MHz  
AMSL Height: 1122.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

*Jeremy Ruck & Associates, Inc.*

KUZX-FM2 54 dBu  
Service Contour

KUZX-FM2 63 dBu  
Service Contour

Exhibit E-8  
Interference Study  
K269FB - Sausalito, California  
IHR Educational Broadcasting  
December, 2013



**K269FB.X**

BLFT20120410AEF  
Latitude: 37-47-54.30 N  
Longitude: 122-24-59.10 W  
ERP: 0.25 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 146.7 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**KHTH**

BLH19920818KG  
Latitude: 38-30-31 N  
Longitude: 122-39-41 W  
ERP: 2.20 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 546.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**KHTH-FM1**

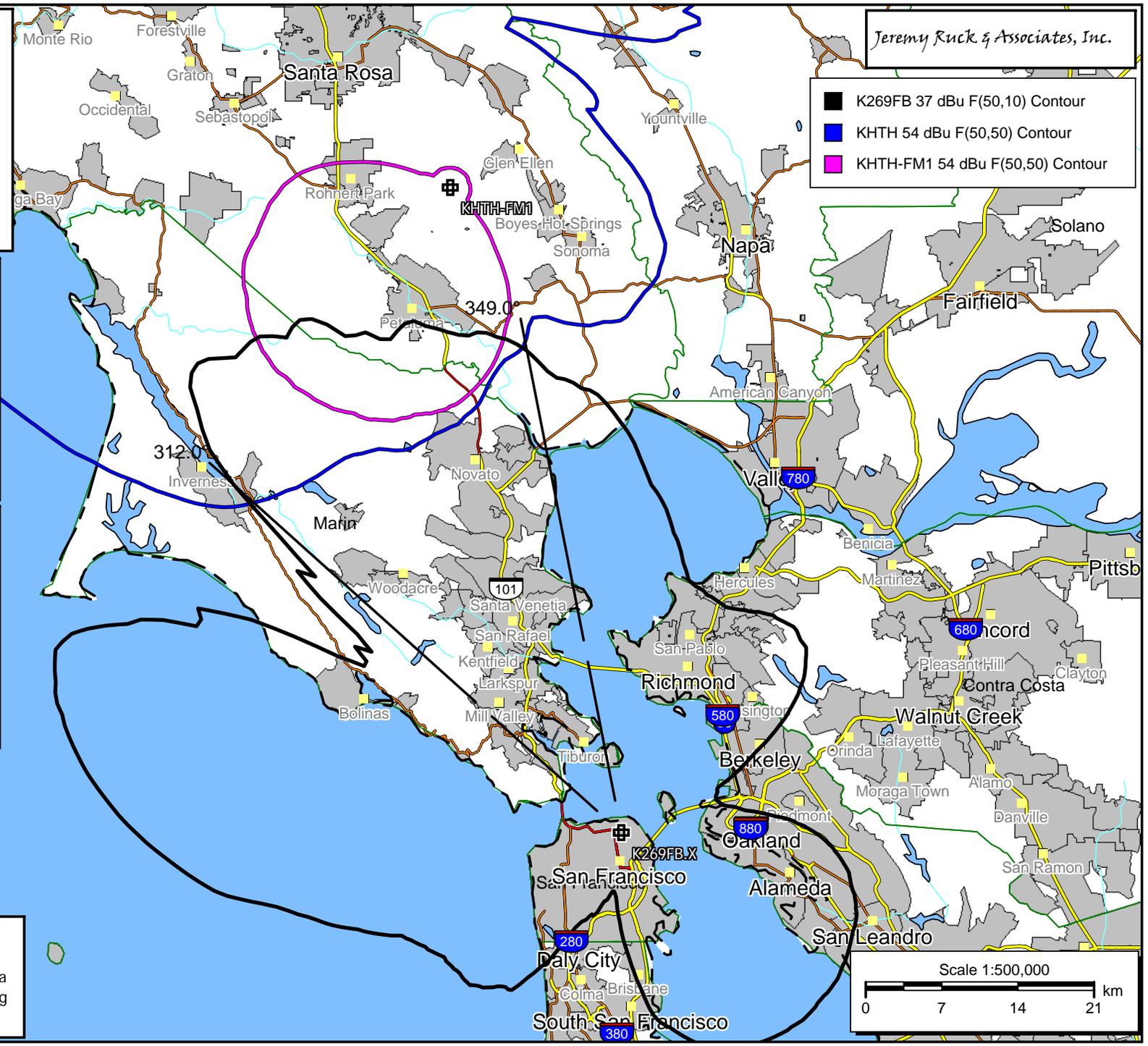
BLFTB19930712TD  
Latitude: 38-19-56 N  
Longitude: 122-35-42 W  
ERP: 0.045 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 579.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**Exhibit E-9**

Interference Study  
K269FB - Sausalito, California  
IHR Educational Broadcasting  
December, 2013

Jeremy Ruck & Associates, Inc.

- K269FB 37 dBu F(50,10) Contour
- KHTH 54 dBu F(50,50) Contour
- KHTH-FM1 54 dBu F(50,50) Contour



## Exhibit E-10 - Partial Tabulation of K269FB 37 dBu F(50,10) Contour

Distance to Contour Report

Type of contour: FCC  
Location Variability: 50.0 %  
Time Variability: 10.0 %  
# of Radials Calculated: 360  
FCC Matching HAAT Calculation Used  
Field Strength: 37.00 dBuV/m

Primary Terrain: NED 3 Second US Terrain  
Secondary Terrain: FCC 30 Second US Database

-----  
Transmitter Information:

Call Letters: K269FB.X  
File Number: BLFT20120410AEF  
Latitude: 37-47-54.30 N  
Longitude: 122-24-59.10 W  
ERP: 0.25 kW  
EIRP: 0.41 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 146.7 m  
Elevation: 87.827 m  
HAAT: 122.93 m  
Horiz. Antenna Pattern: Directional  
Vert. Elevation Pattern: No  
-----

Azimuth (deg)	Distance (km)	HAAT (m)
312.0	47.86	81.7
313.0	51.64	98.6
314.0	53.46	109.1
315.0	55.05	119.7
316.0	56.96	133.8
317.0	57.81	140.3
318.0	58.08	142.8
319.0	57.73	141.1
320.0	56.97	136.5
321.0	56.24	132.8
322.0	56.37	134.8
323.0	56.51	137.1
324.0	56.39	137.7
325.0	55.74	134.3
326.0	54.90	130.5
327.0	55.40	135.9
328.0	55.59	139.2
329.0	55.09	137.9
330.0	53.92	131.6
331.0	52.18	121.6
332.0	51.79	121.4
333.0	51.62	122.7
334.0	50.48	117.3
335.0	50.04	117.0
336.0	50.46	122.8
337.0	50.81	128.5
338.0	50.72	131.0
339.0	49.87	128.1
340.0	49.28	127.1
341.0	48.64	126.3
342.0	48.09	126.3
343.0	47.76	127.6
344.0	47.83	132.3
345.0	47.54	134.4
346.0	46.93	134.5
347.0	46.51	136.1
348.0	45.87	136.1
349.0	45.10	135.2

JEREMY RUCK & ASSOCIATES, INC.

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jeremyruck.com

**K269FB.X**

BLFT20120410AEF  
Latitude: 37-47-54.30 N  
Longitude: 122-24-59.10 W  
ERP: 0.25 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 146.7 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**KHTH**

BLH19920818KG  
Latitude: 38-30-31 N  
Longitude: 122-39-41 W  
ERP: 2.20 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 546.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**KHTH-FM1**

BLFTB19930712TD  
Latitude: 38-19-56 N  
Longitude: 122-35-42 W  
ERP: 0.045 kW  
Channel: 269  
Frequency: 101.7 MHz  
AMSL Height: 579.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

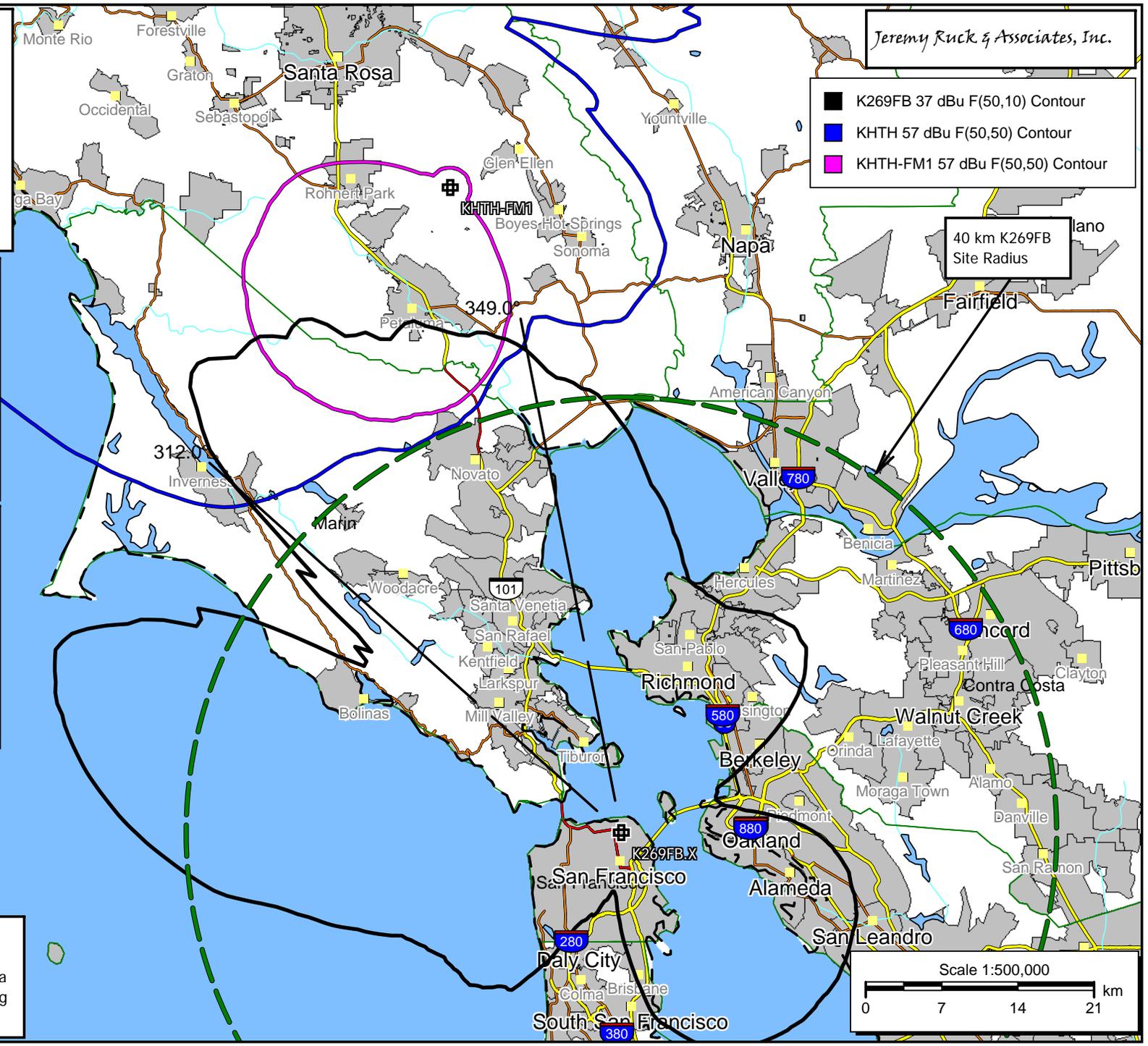
**Exhibit E-11**

Interference Study  
K269FB - Sausalito, California  
IHR Educational Broadcasting  
December, 2013

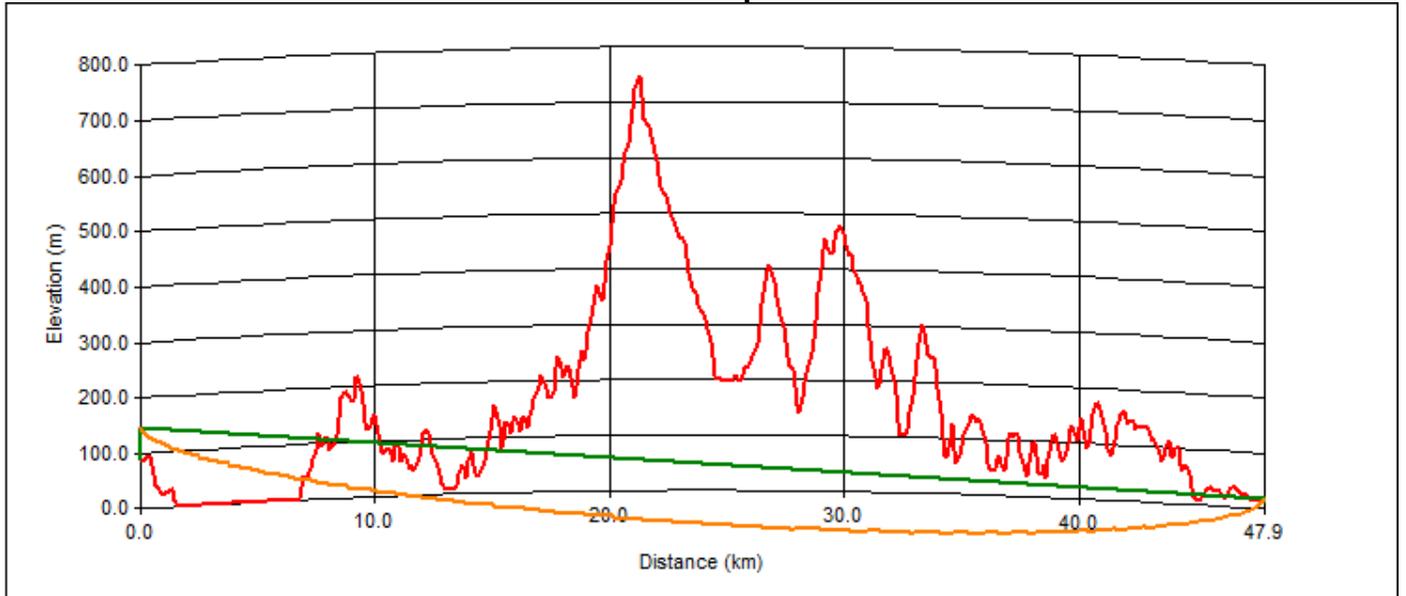
Jeremy Ruck & Associates, Inc.

- K269FB 37 dBu F(50,10) Contour
- KHTH 57 dBu F(50,50) Contour
- KHTH-FM1 57 dBu F(50,50) Contour

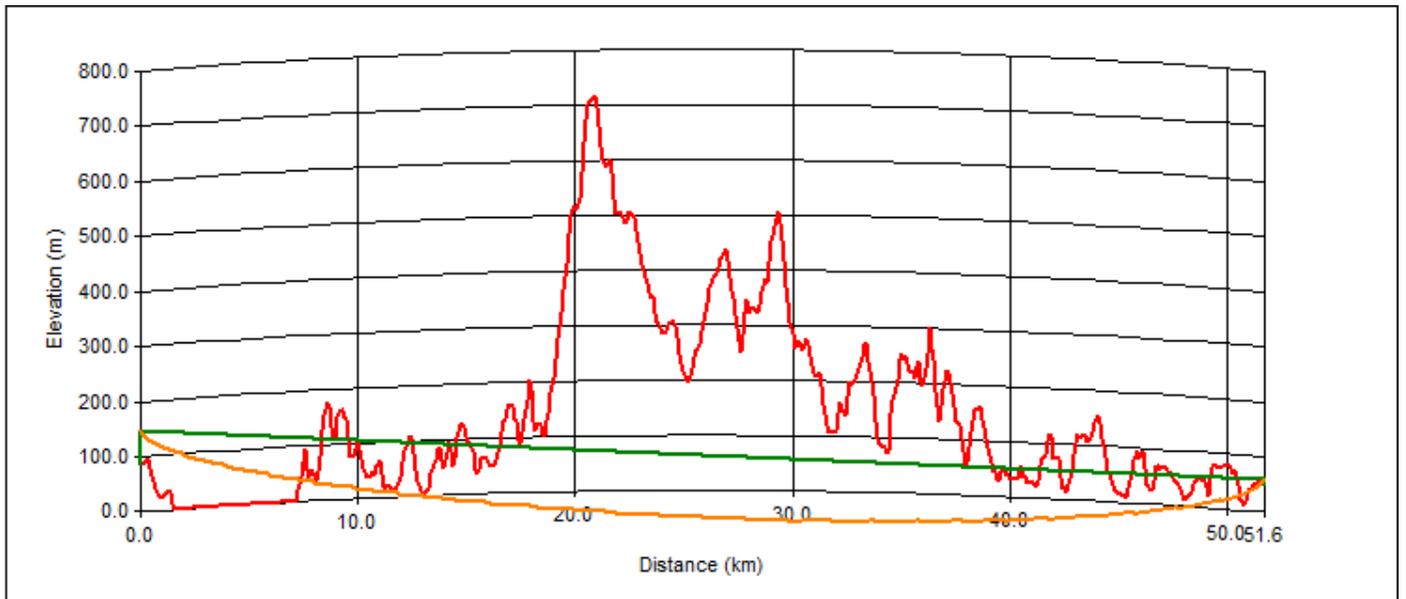
40 km K269FB Site Radius



### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



312 Degree True Terrain Profile Graph



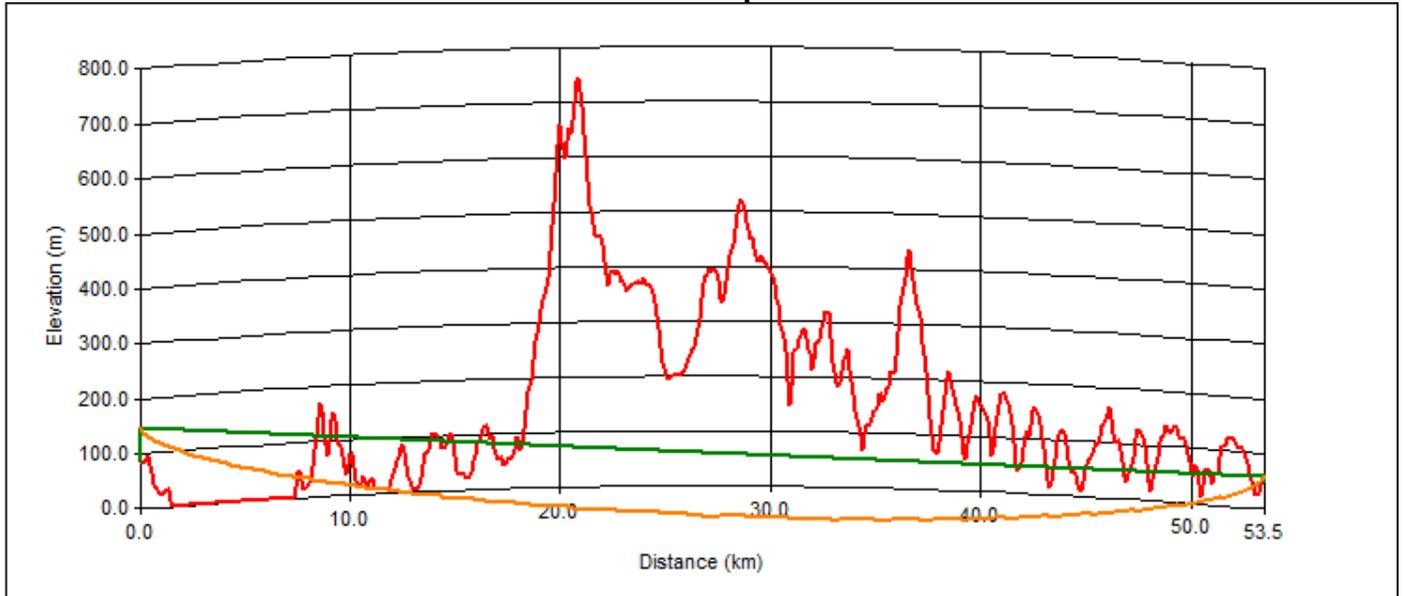
313 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

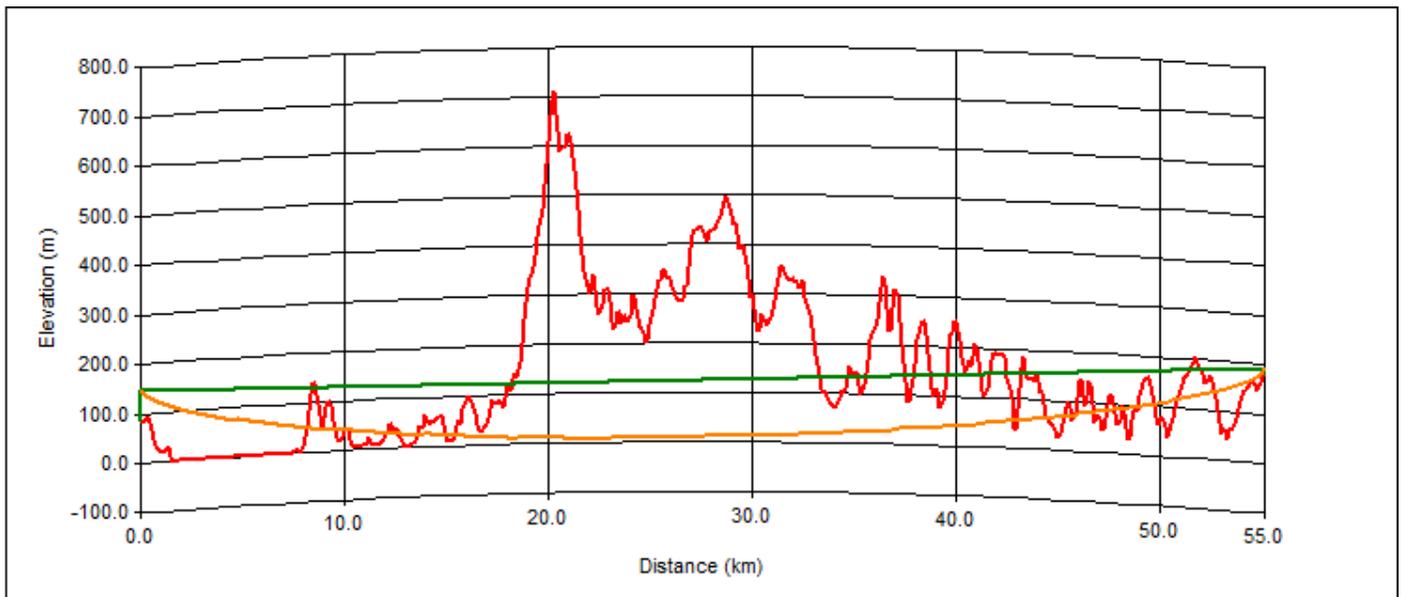
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Fax: 855.332.9537  
jeremyruck.com

### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



314 Degree True Terrain Profile Graph.



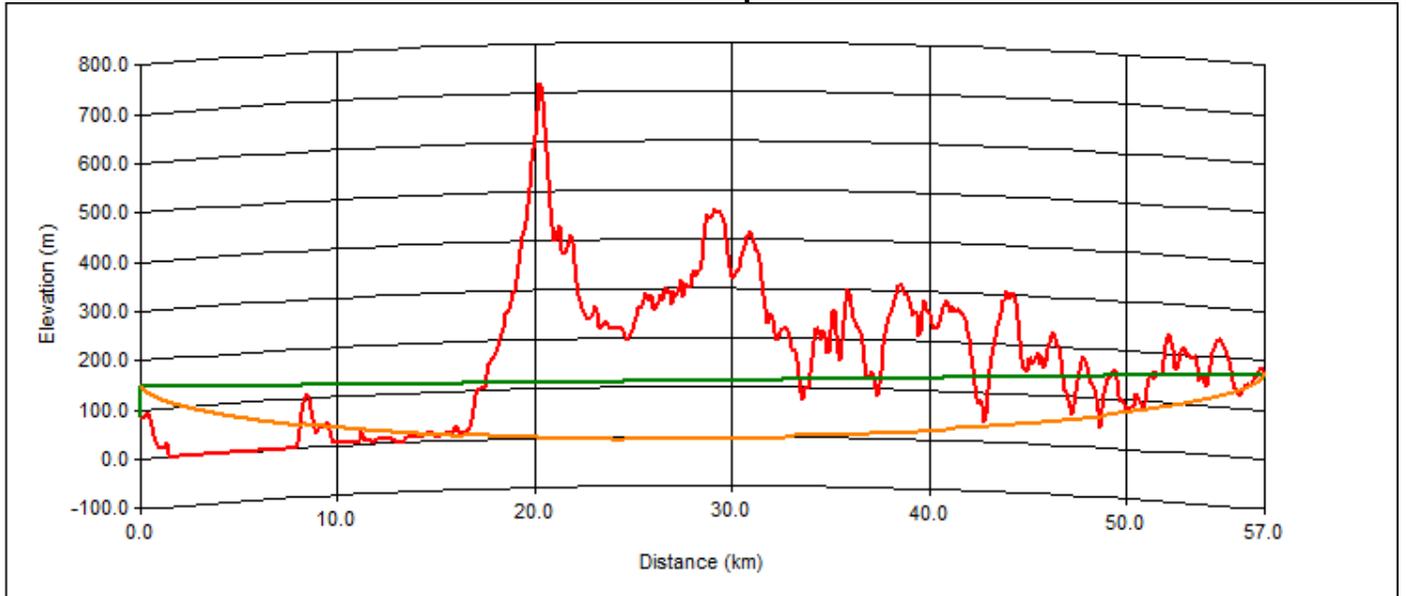
315 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

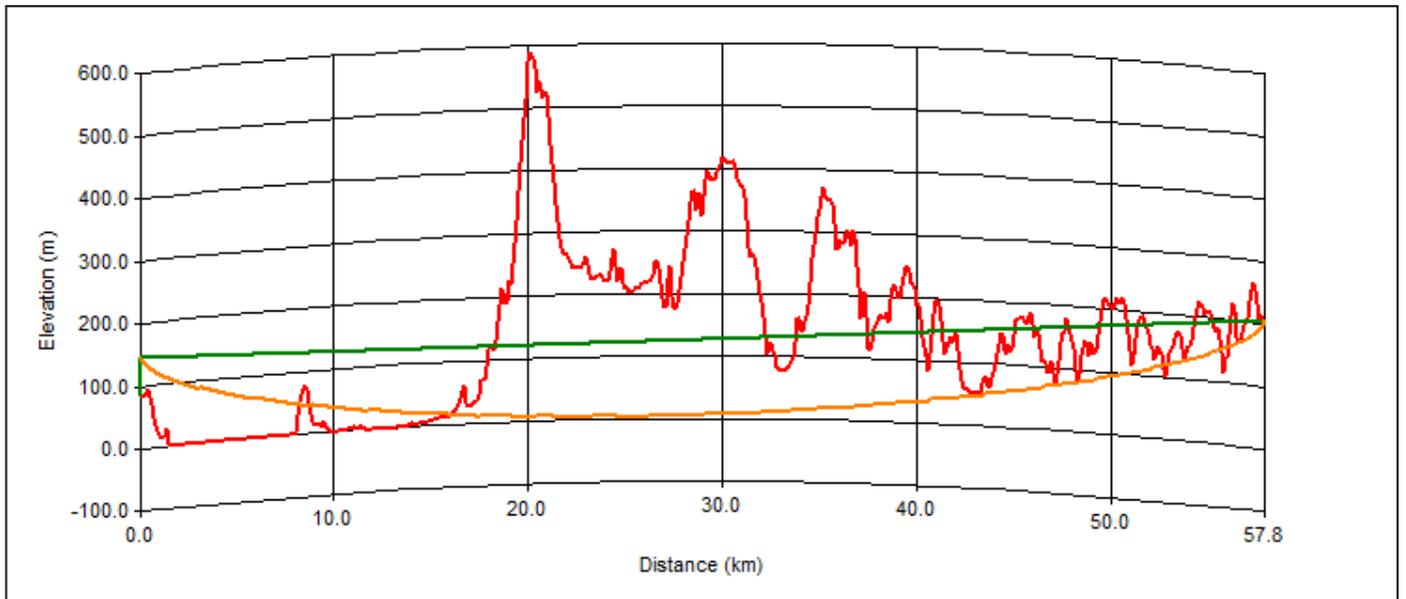
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### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



316 Degree True Terrain Profile Graph.



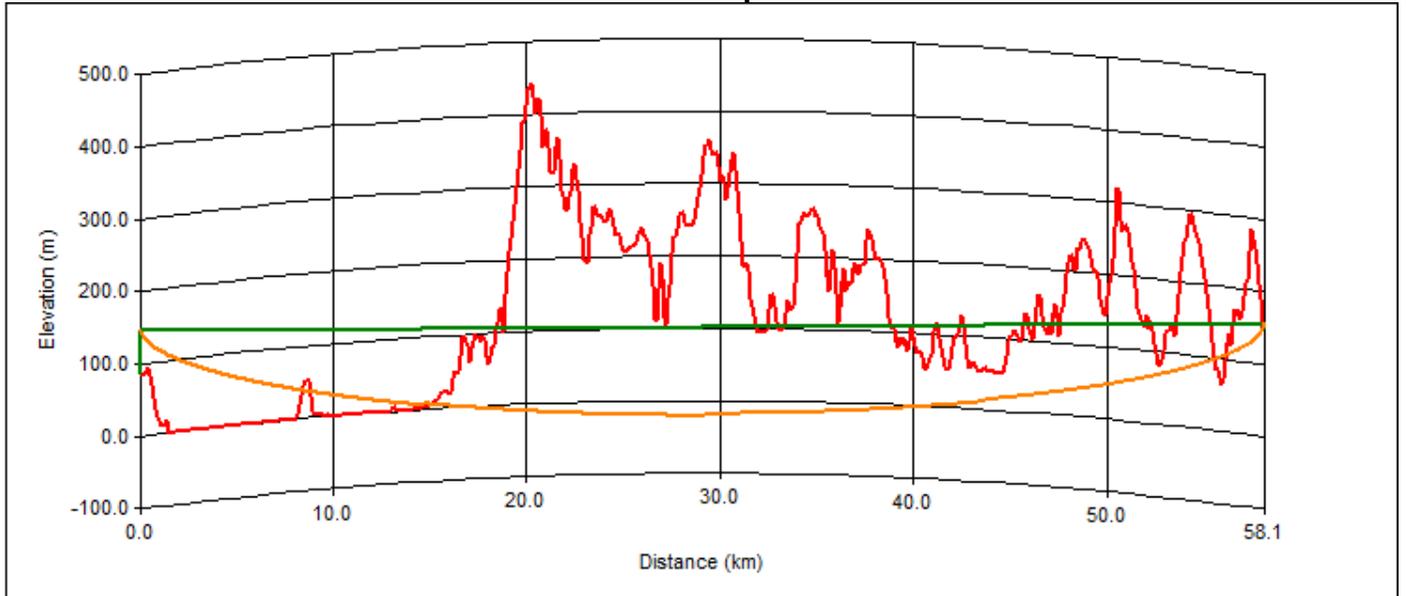
317 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

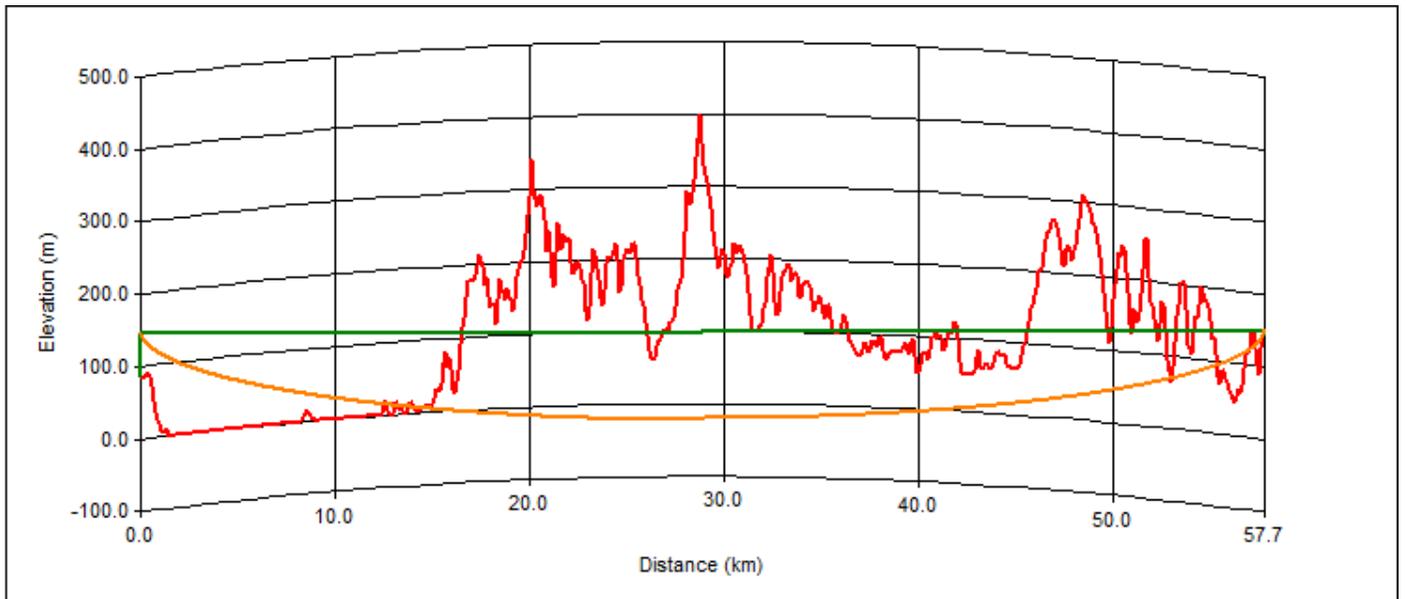
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### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



318 Degree True Terrain Profile Graph.



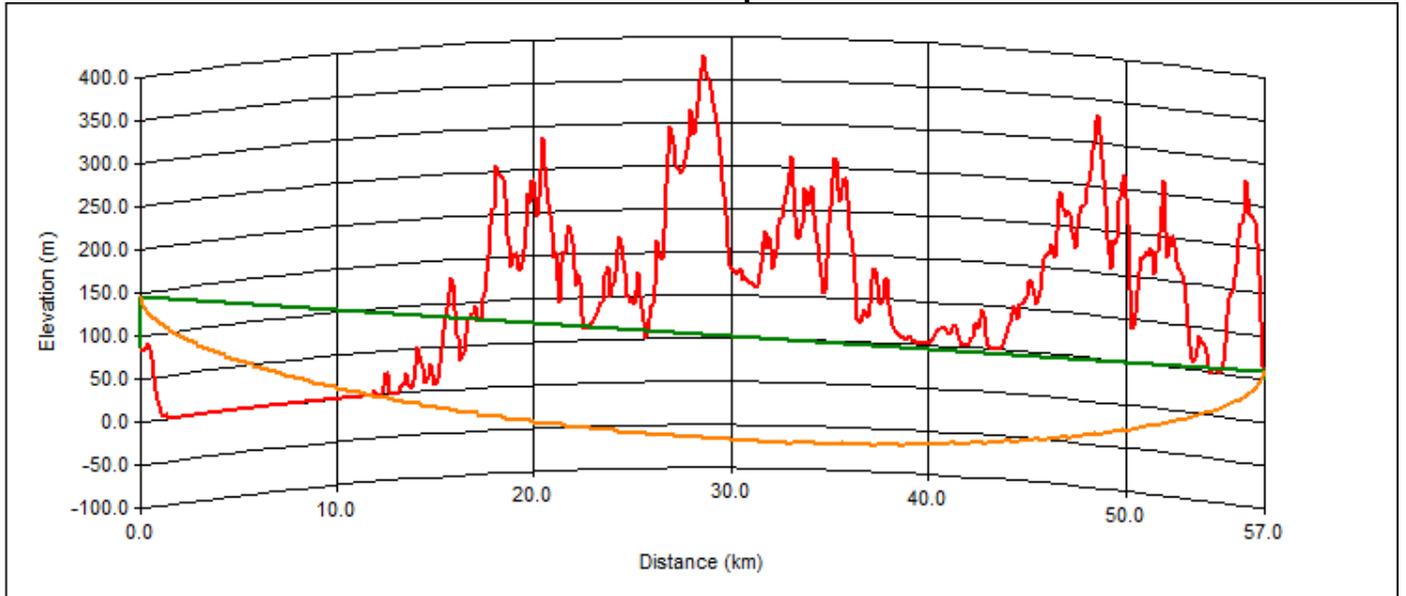
319 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

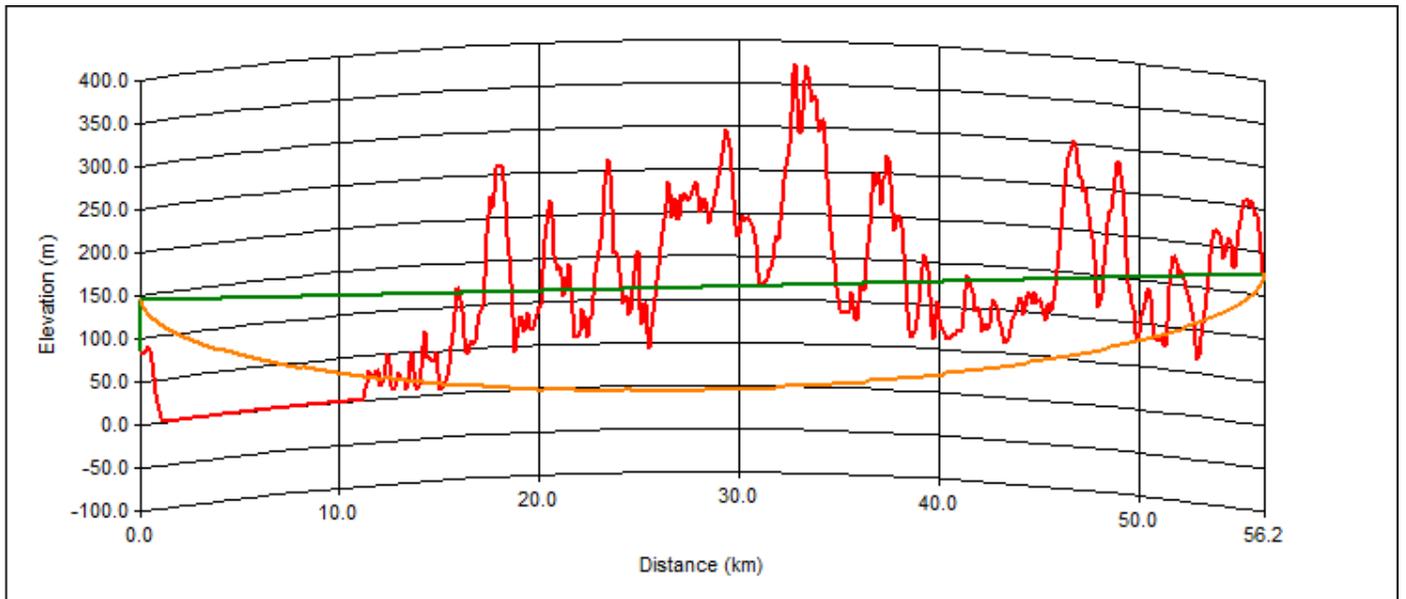
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### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



320 Degree True Terrain Profile Graph.



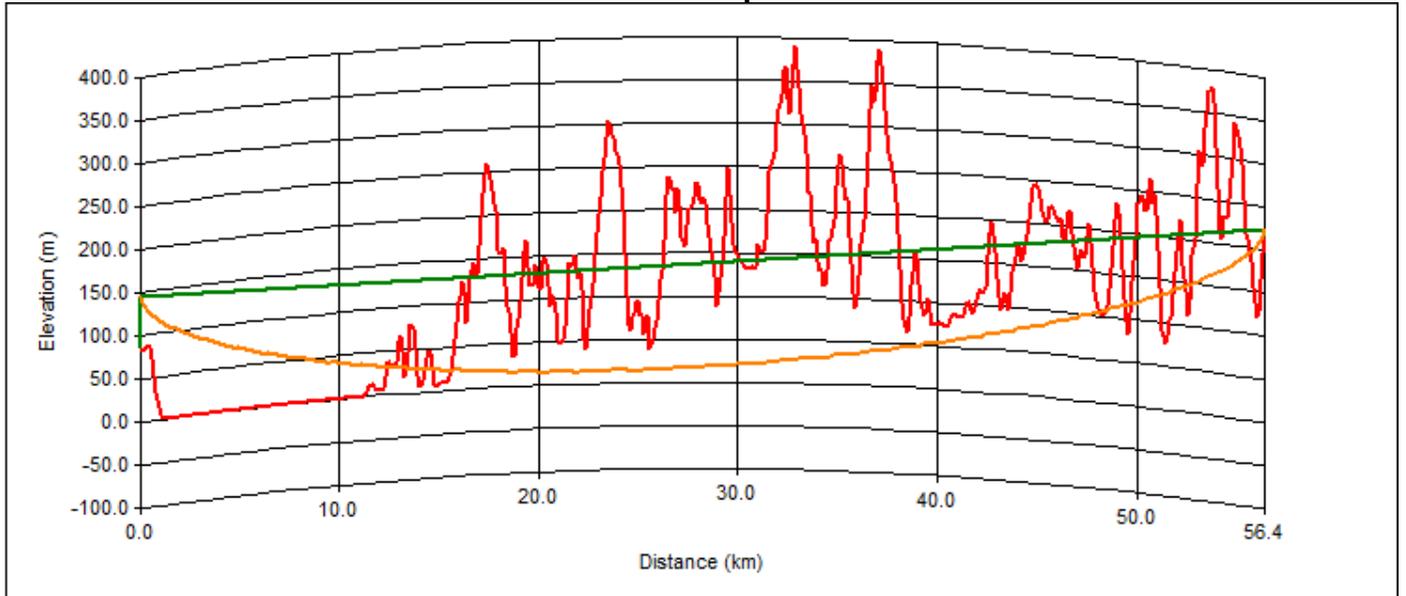
321 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

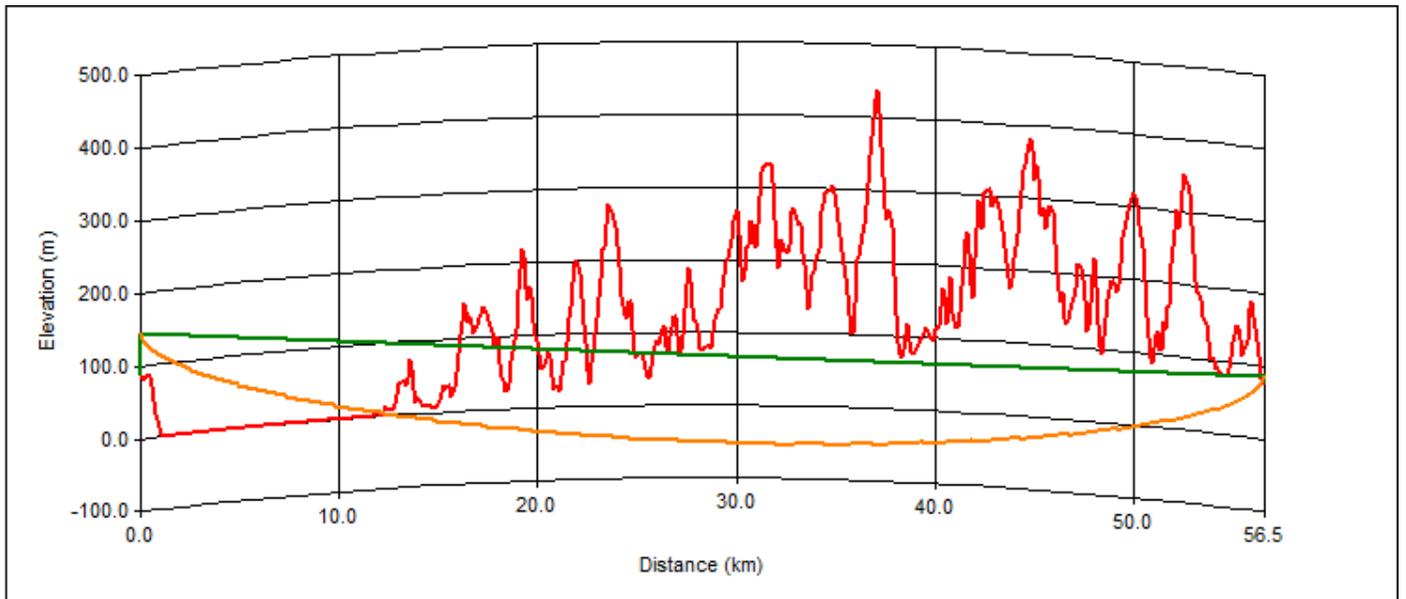
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### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



322 Degree True Terrain Profile Graph.



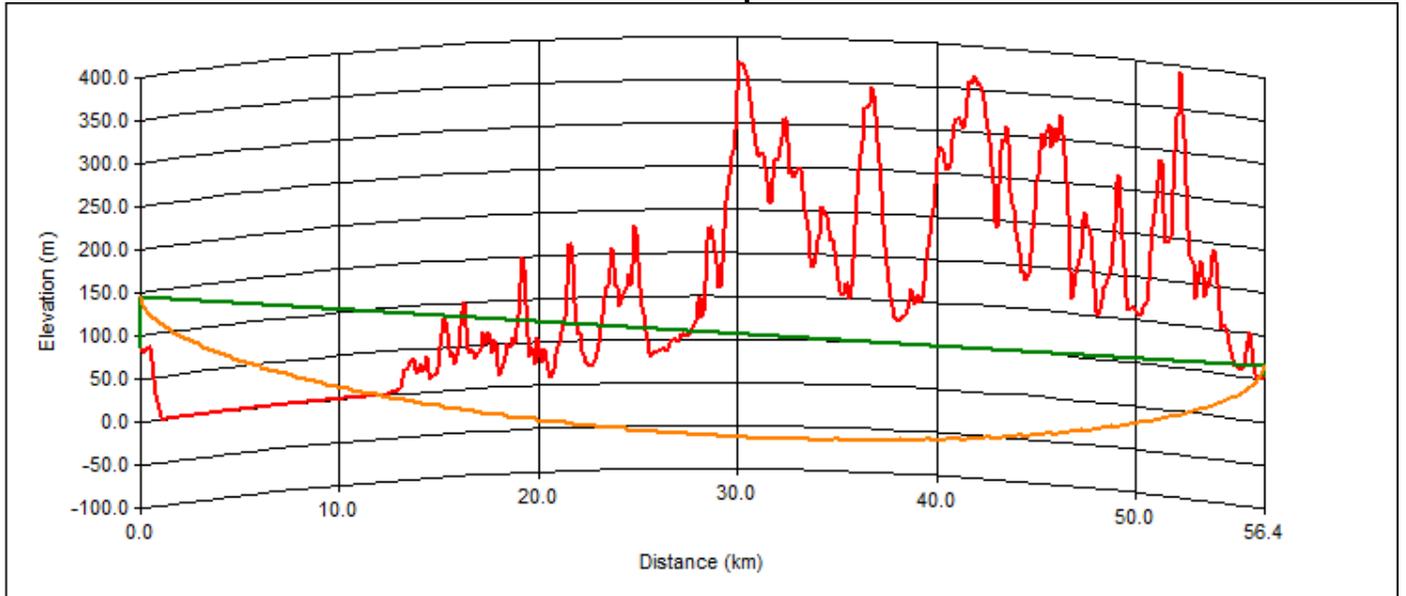
323 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

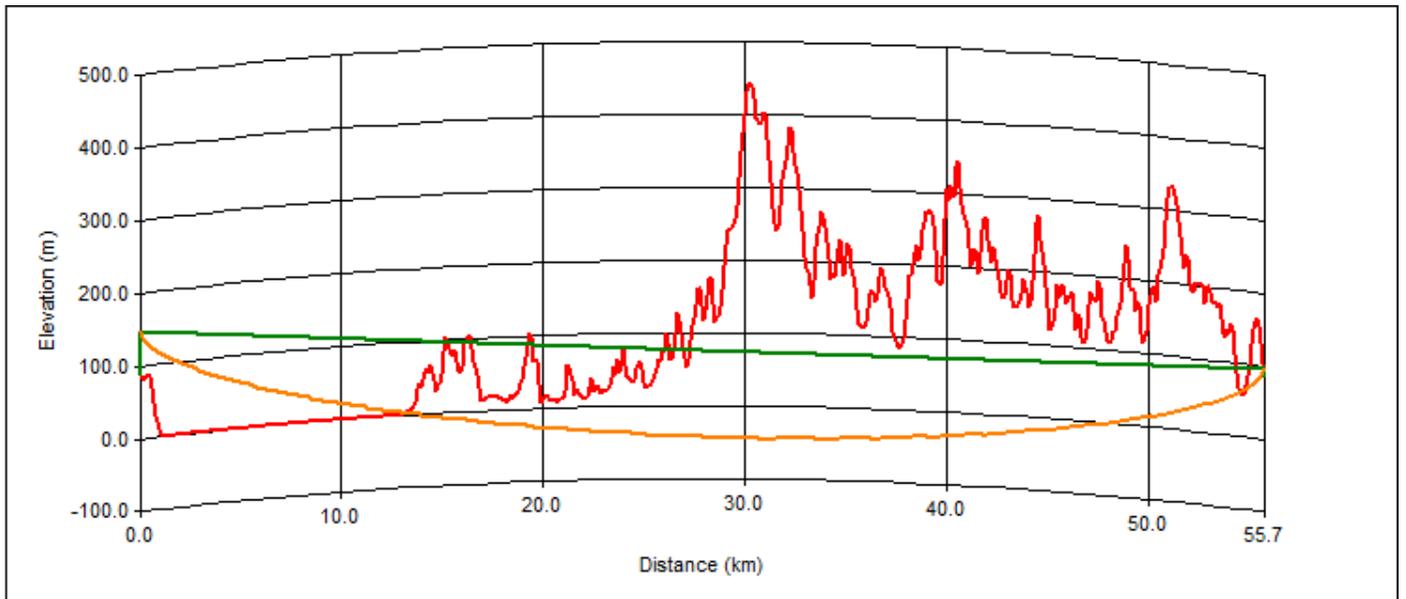
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### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



324 Degree True Terrain Profile Graph.



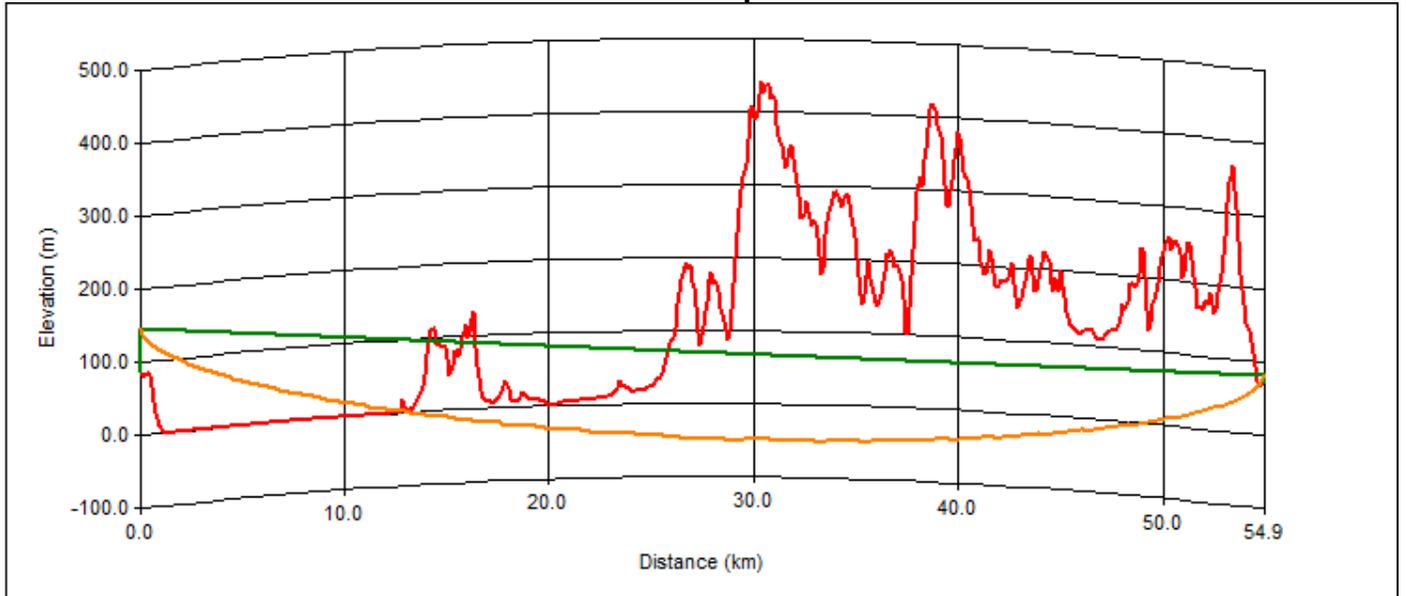
325 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

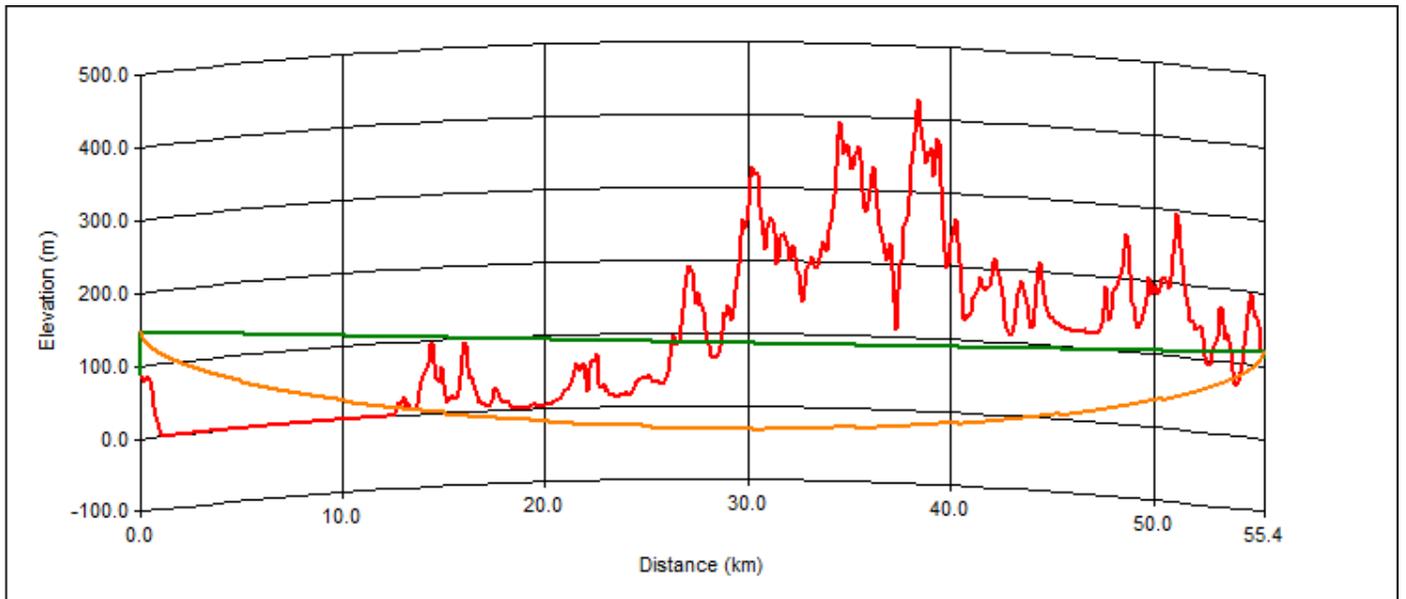
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Tel: 309.647.1200  
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### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



326 Degree True Terrain Profile Graph.



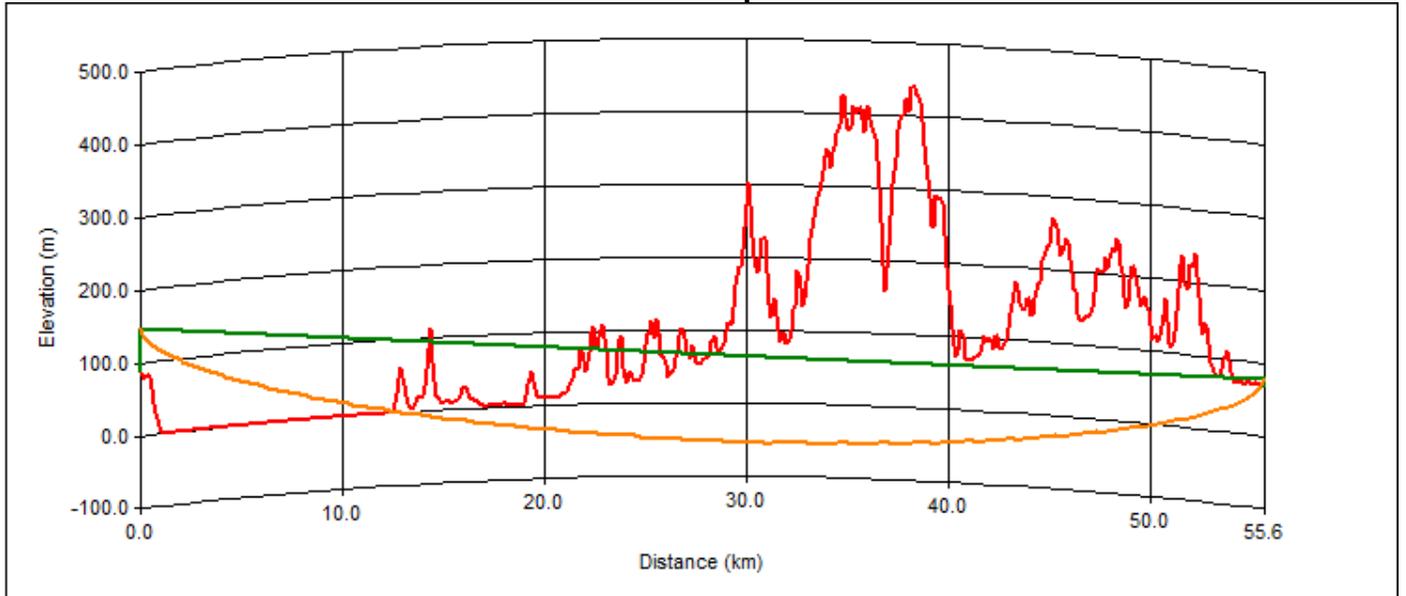
327 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

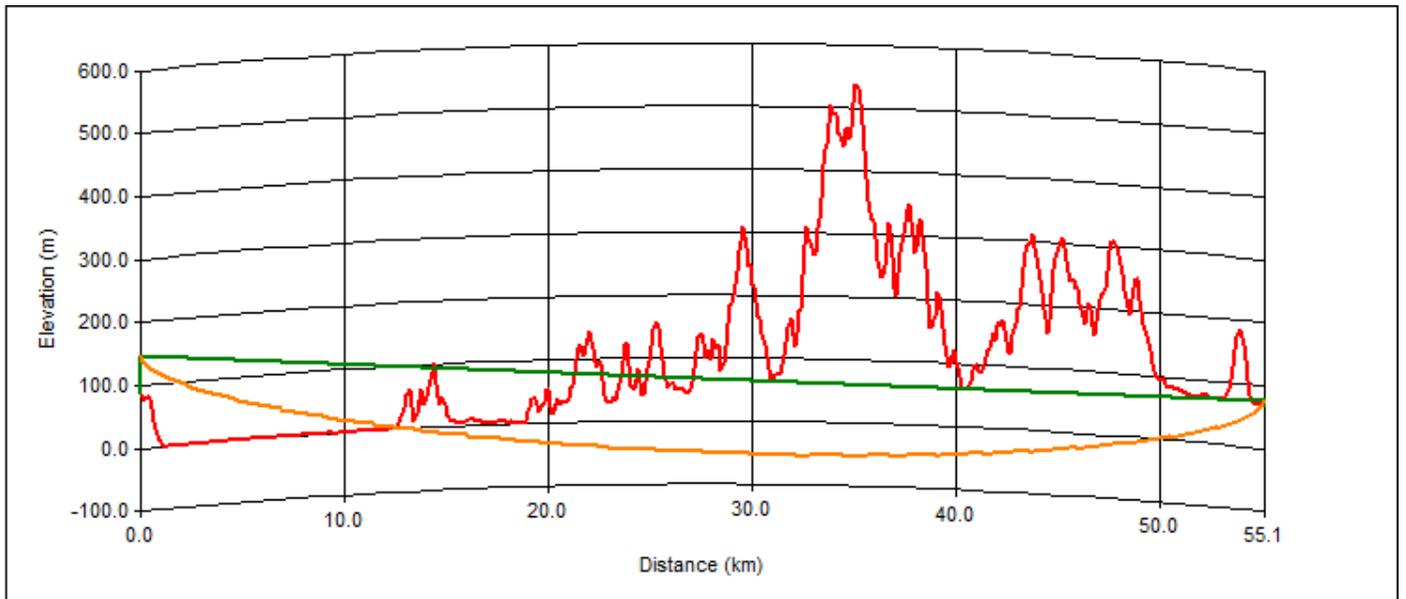
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Tel: 309.647.1200  
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jeremyruck.com

### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



328 Degree True Terrain Profile Graph.



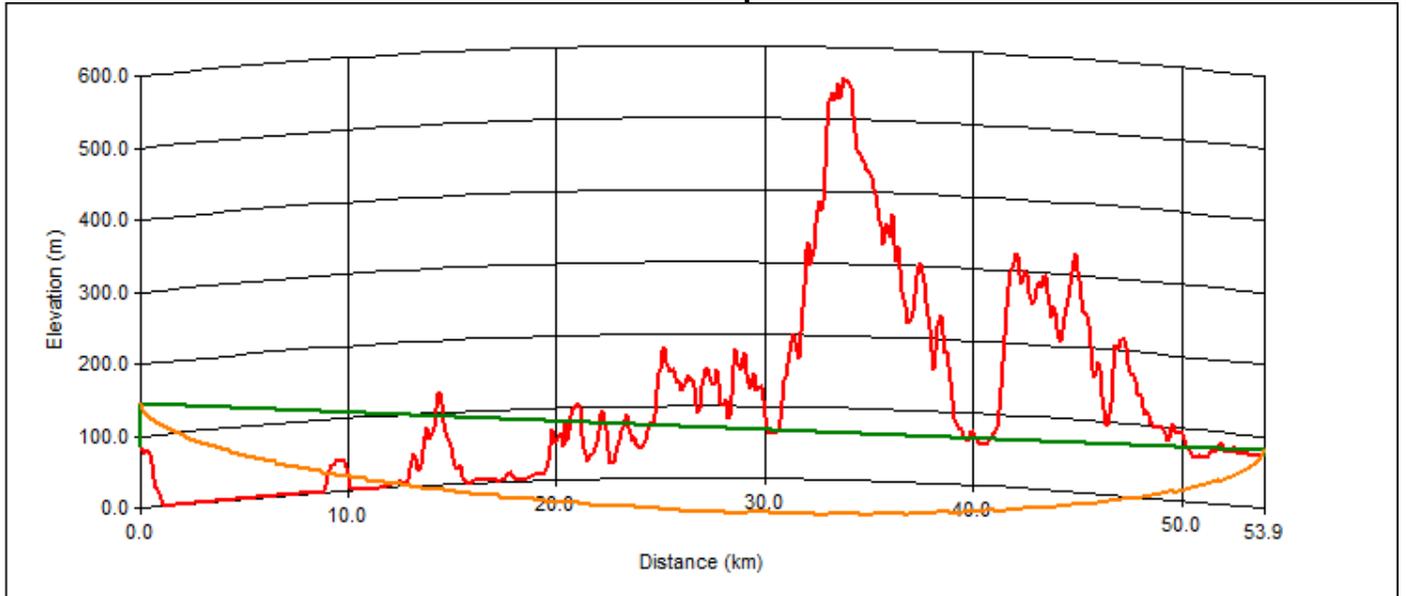
329 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

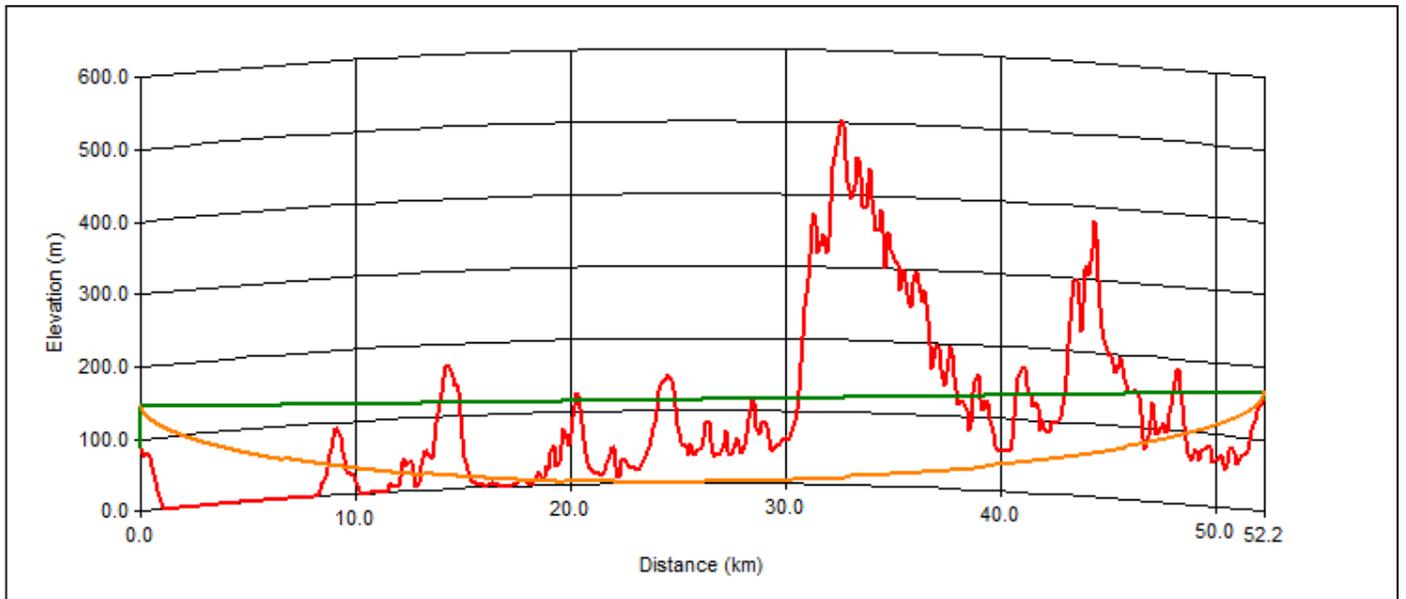
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### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



330 Degree True Terrain Profile Graph.



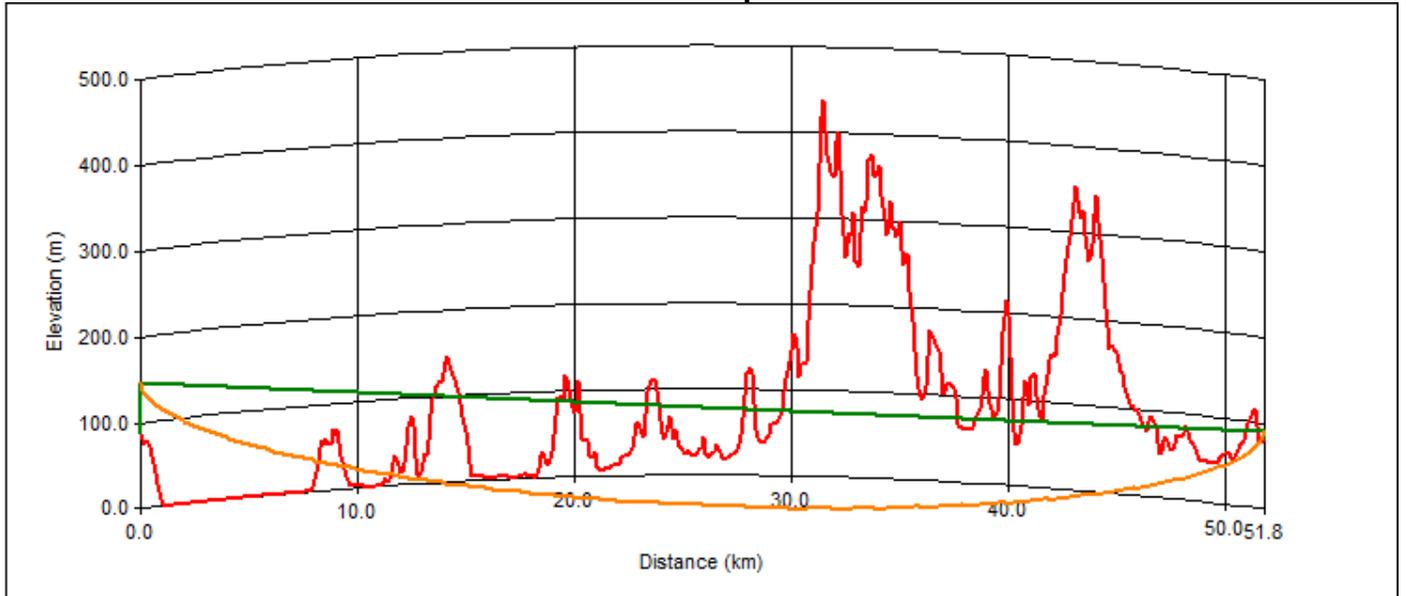
331 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

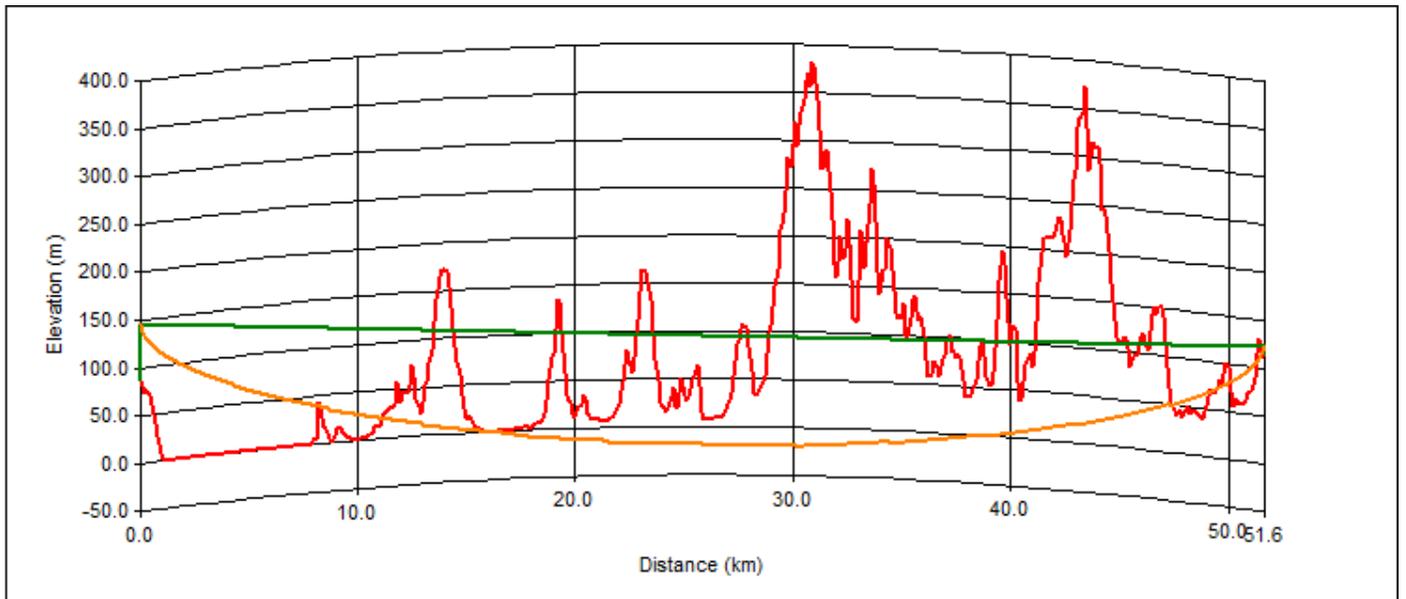
P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



332 Degree True Terrain Profile Graph.



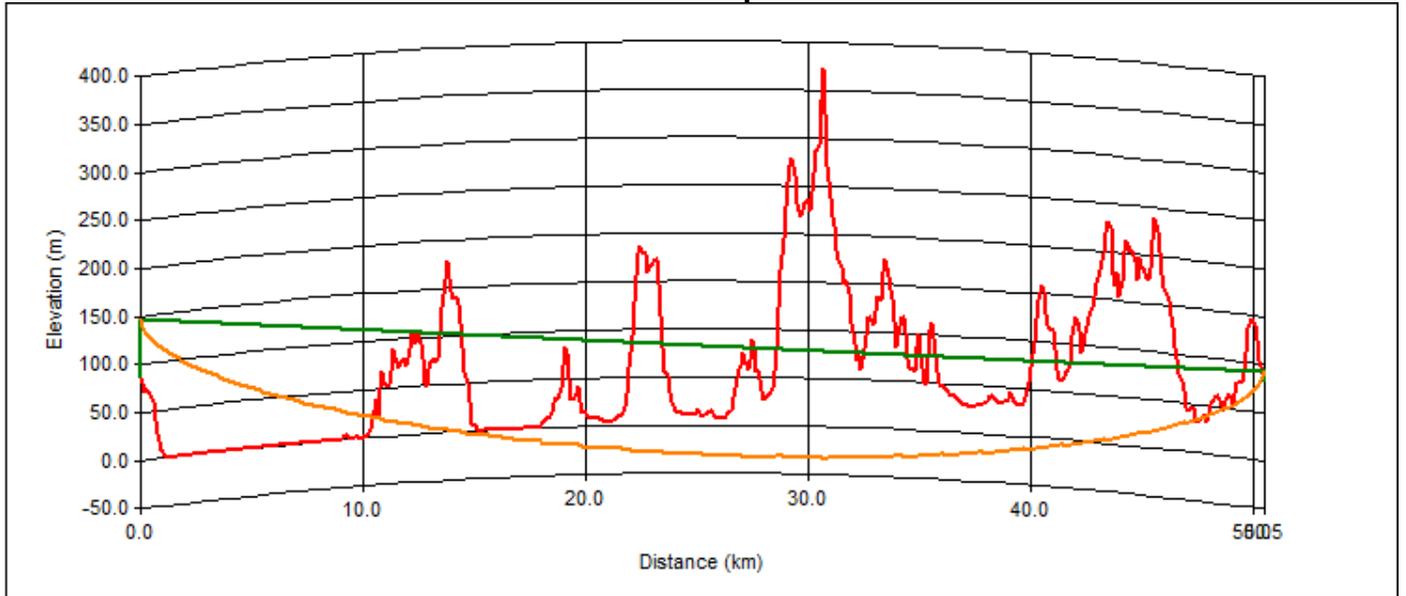
333 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

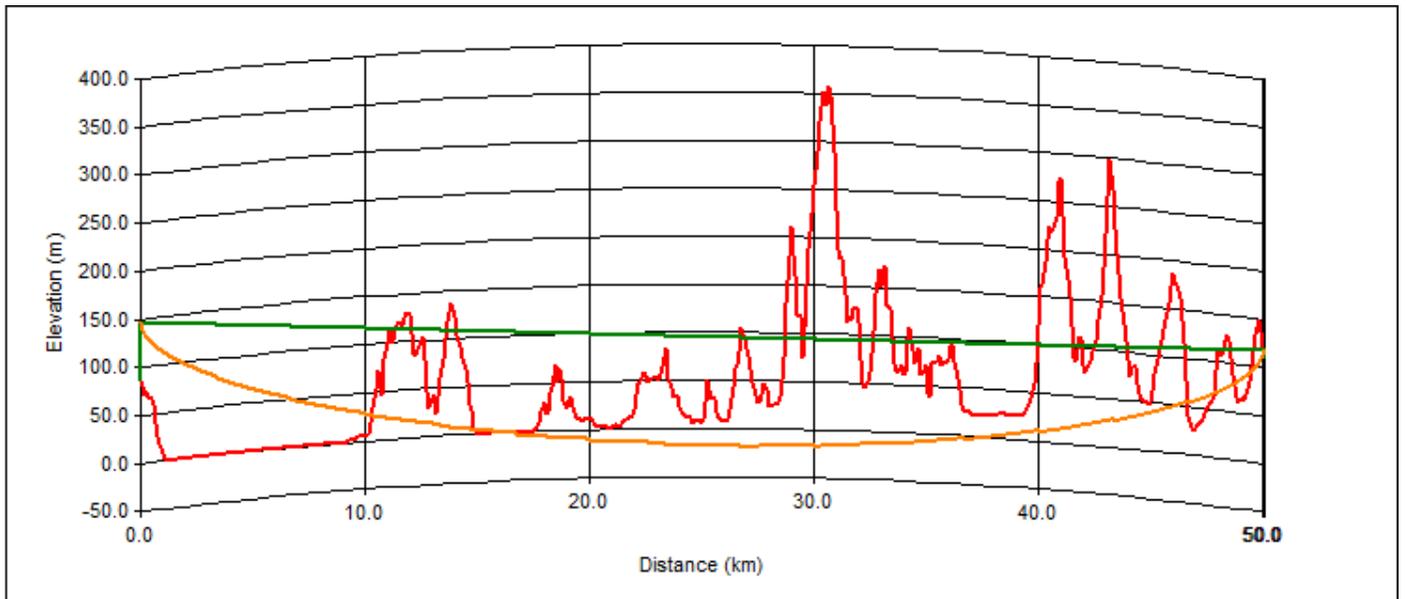
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334 Degree True Terrain Profile Graph.



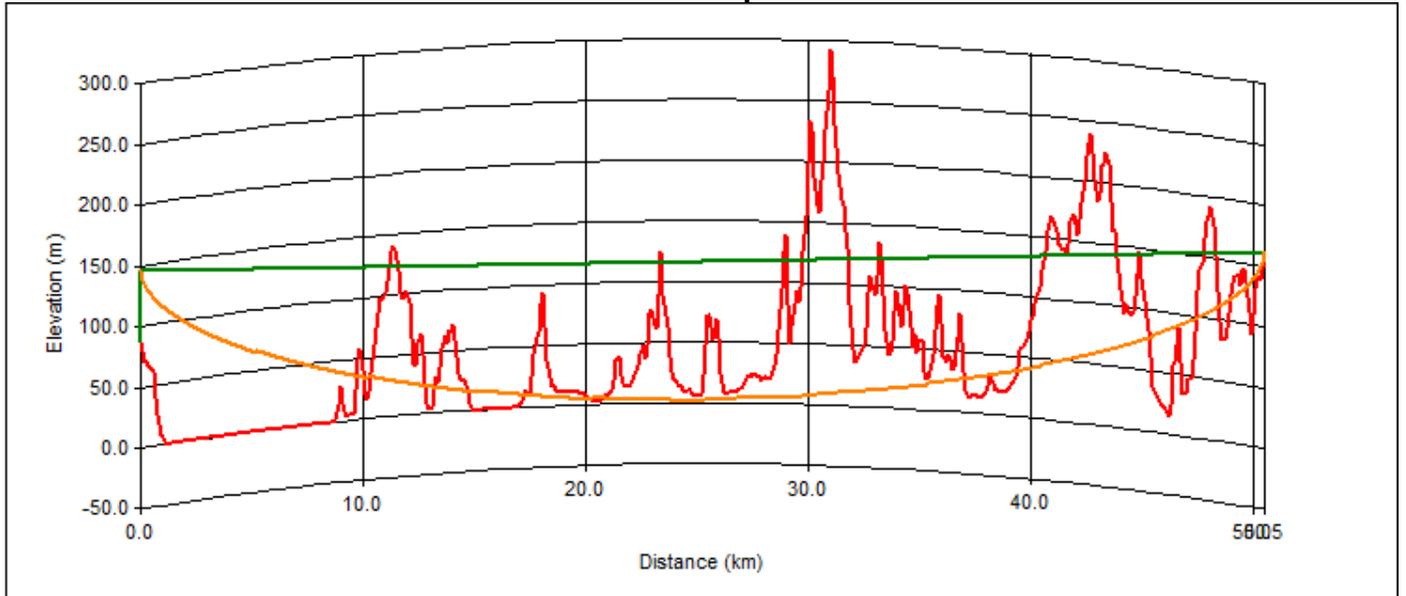
335 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

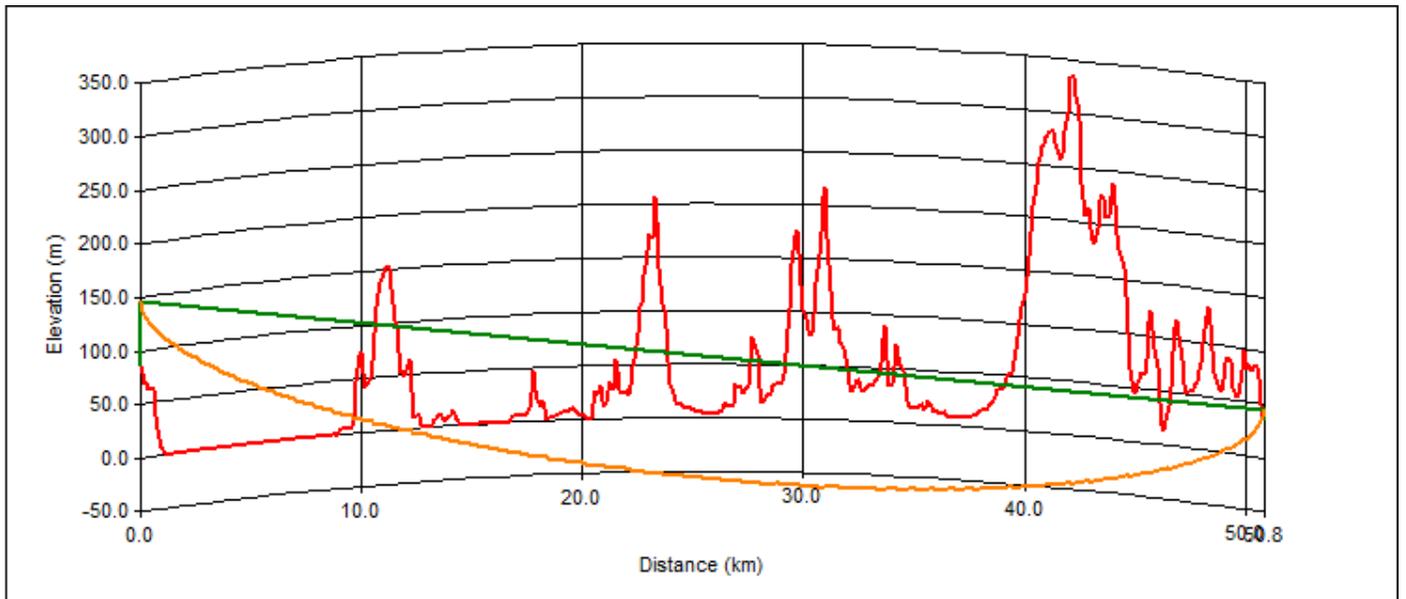
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336 Degree True Terrain Profile Graph.



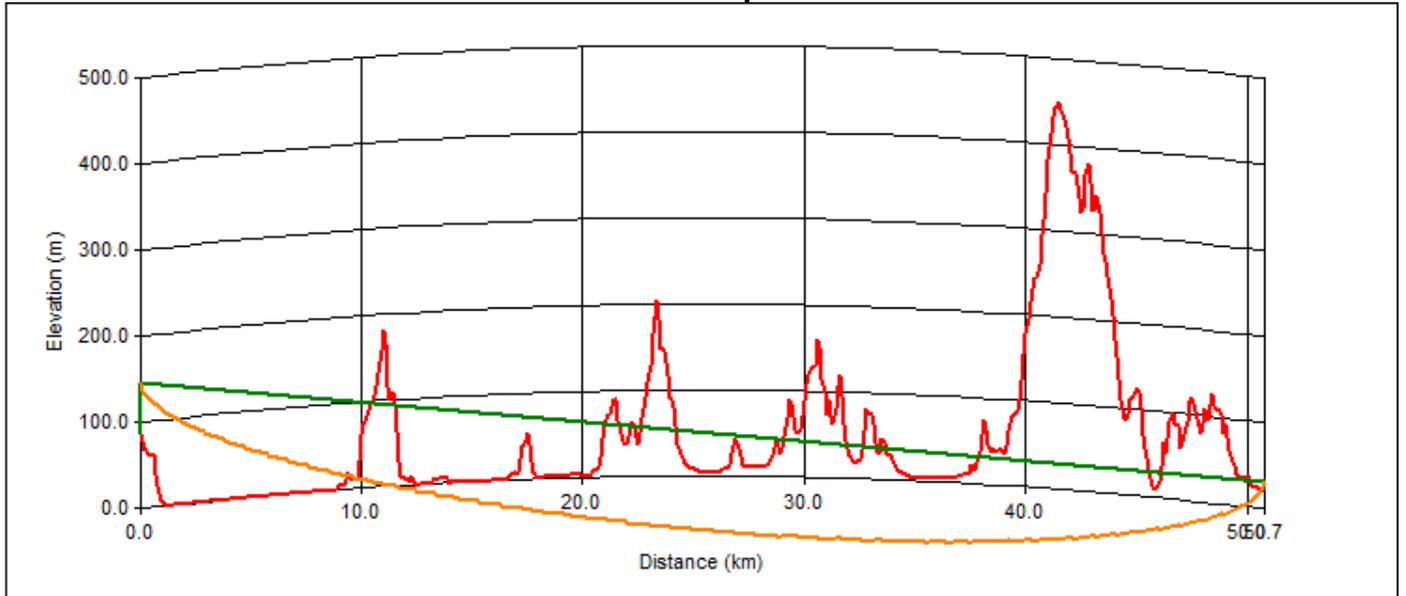
337 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

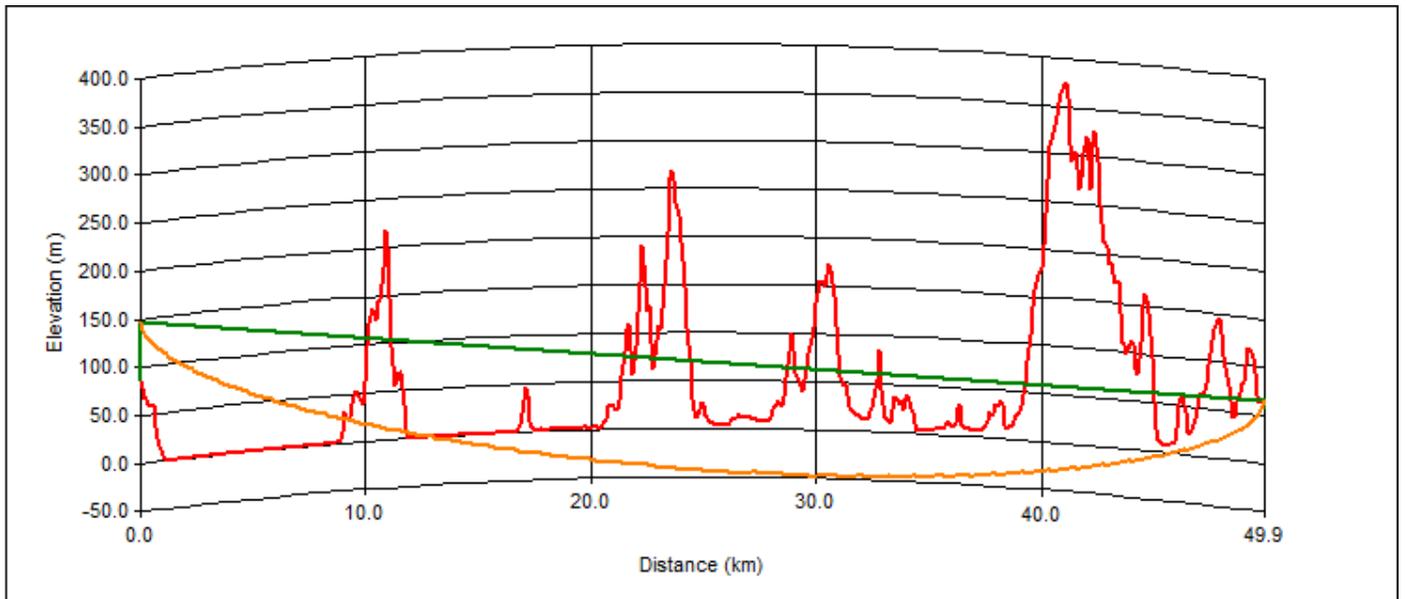
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### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



338 Degree True Terrain Profile Graph.



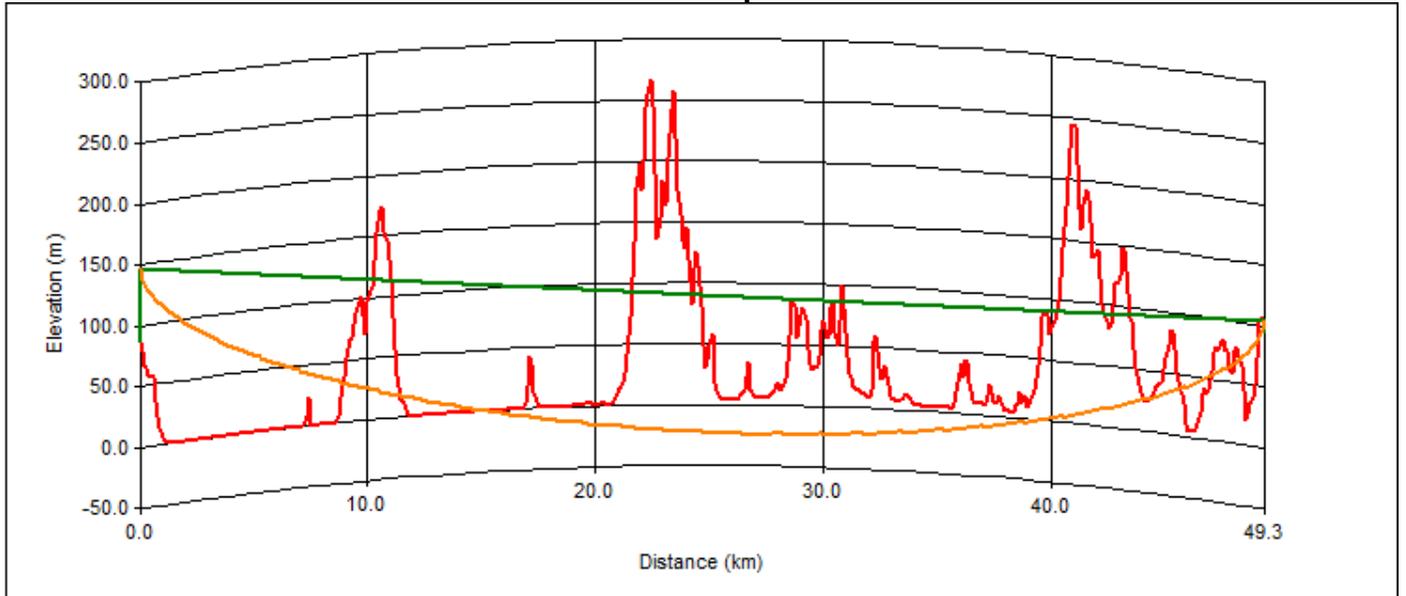
339 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

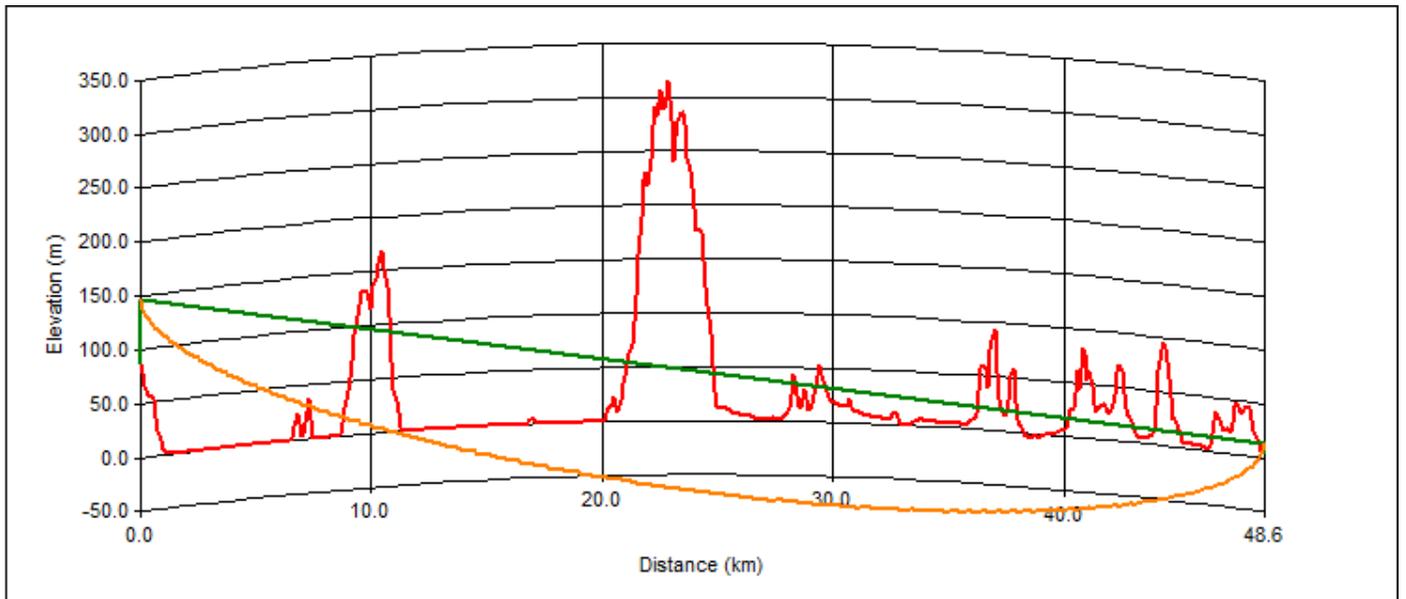
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### Exhibit E-12 - Terrain Profile Graphs Across Arc of Interest



340 Degree True Terrain Profile Graph.



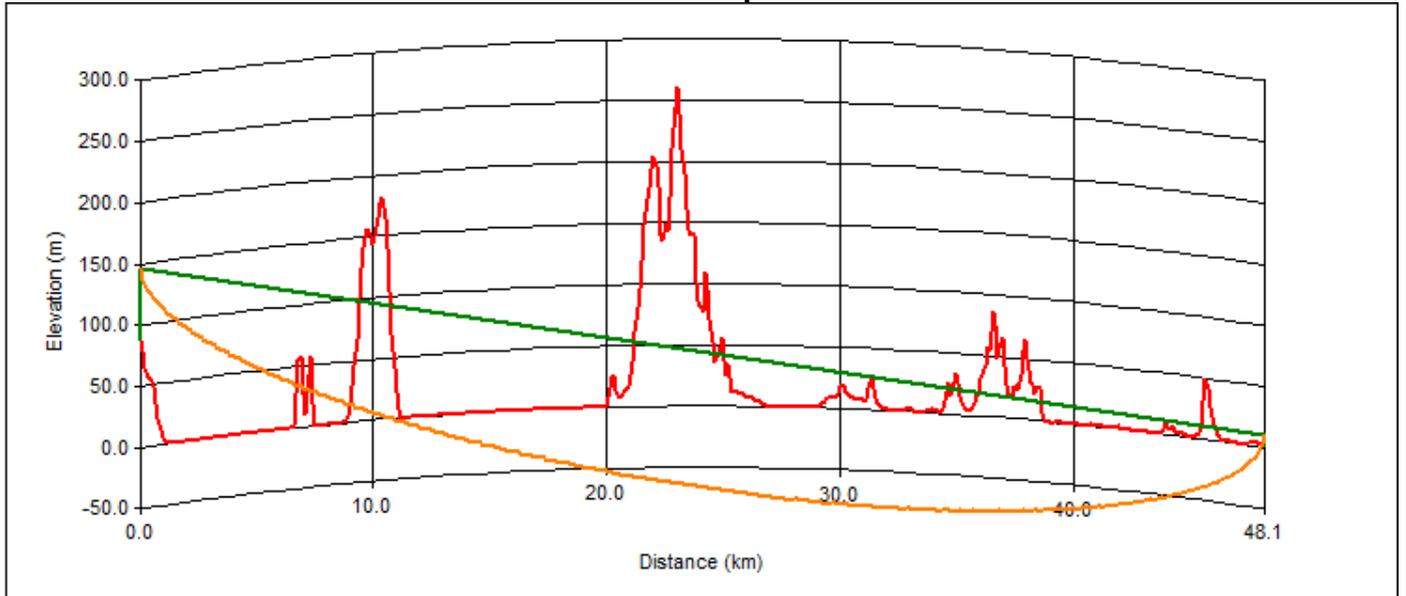
341 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

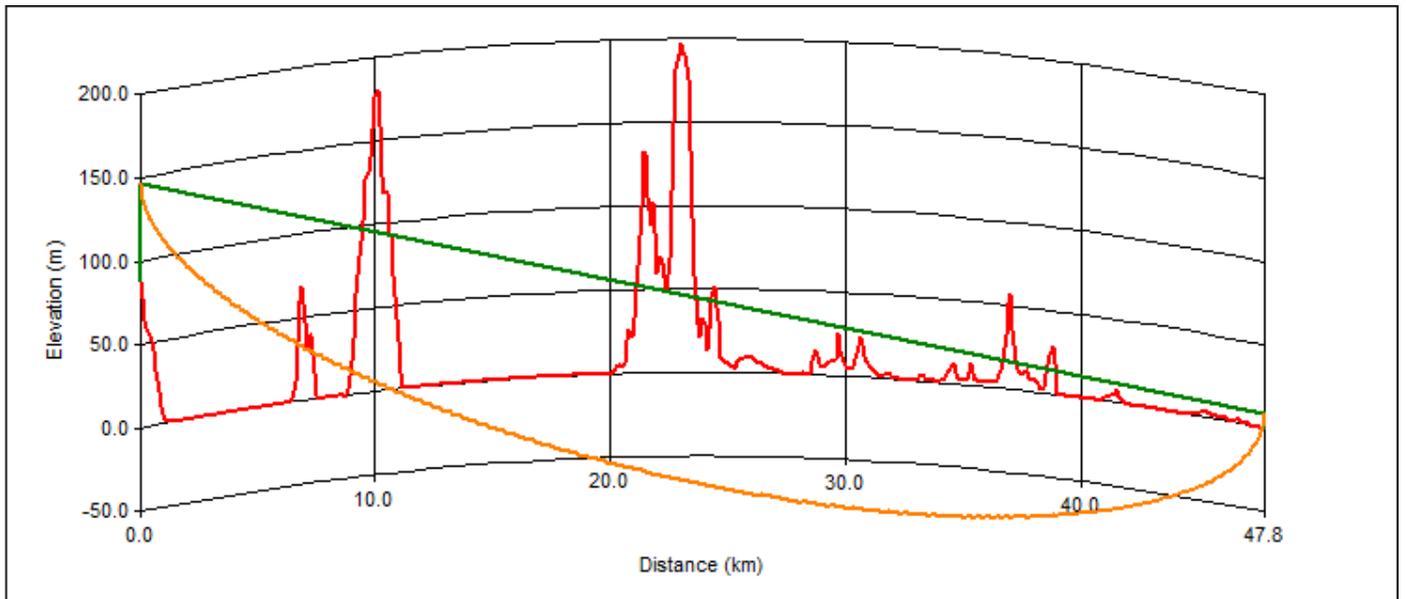
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342 Degree True Terrain Profile Graph.



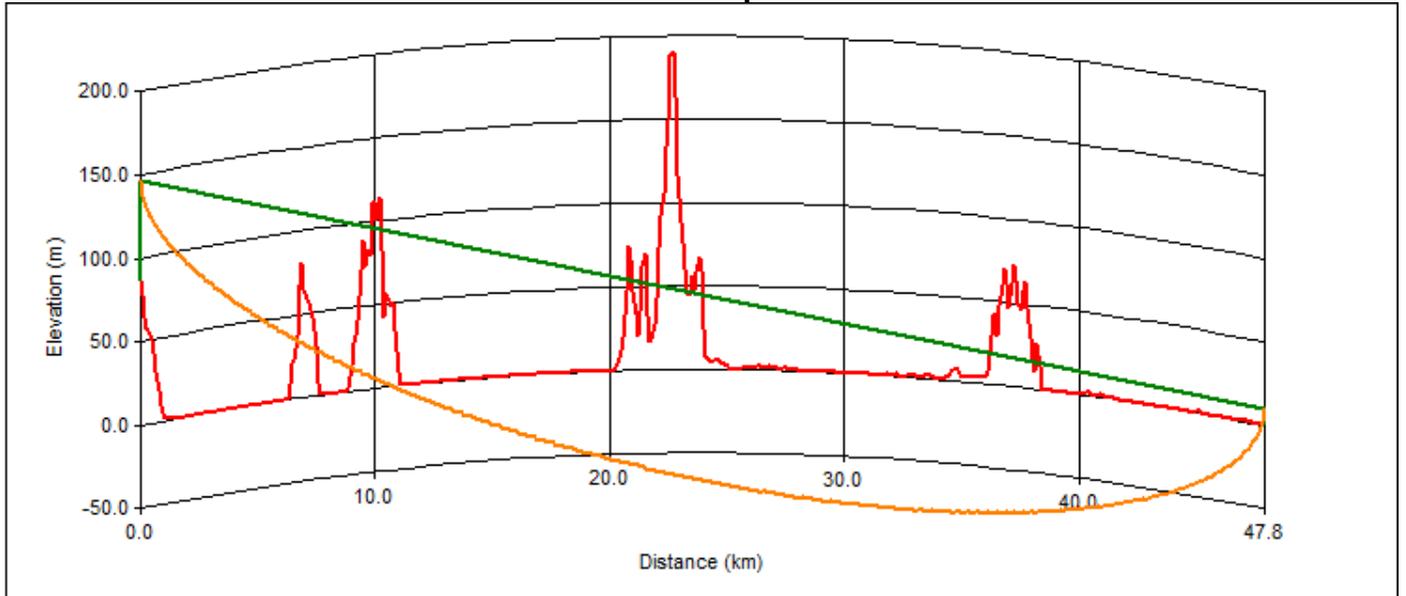
343 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

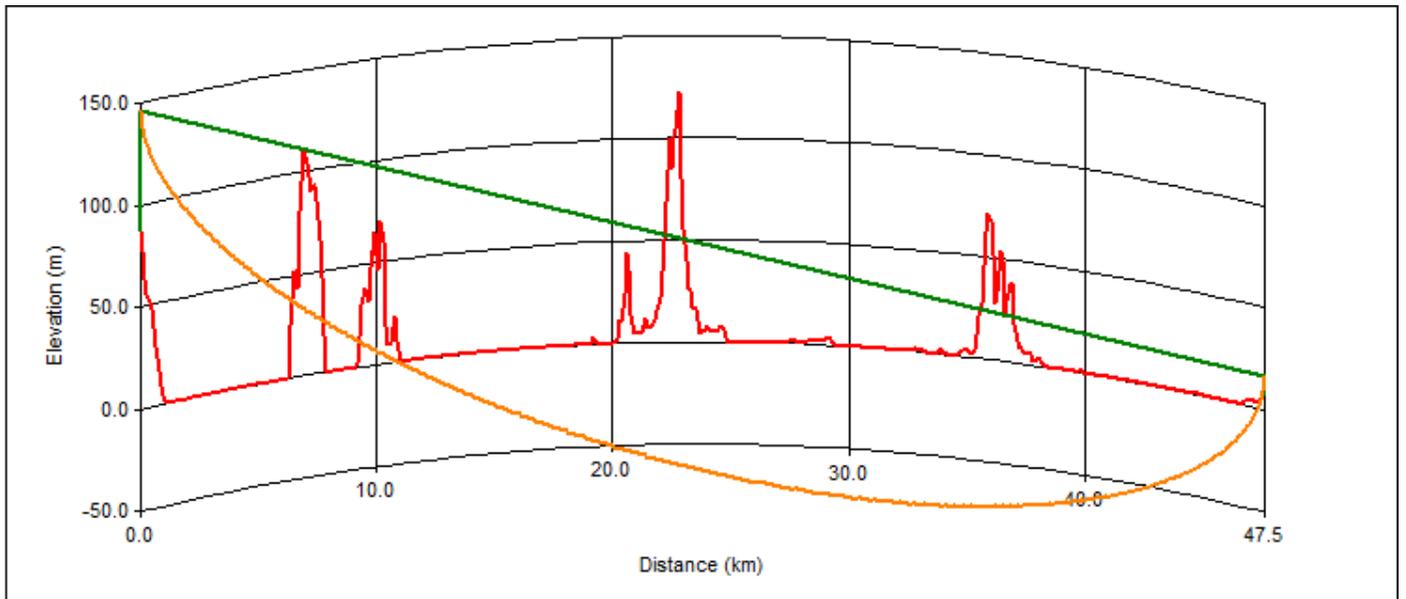
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344 Degree True Terrain Profile Graph.



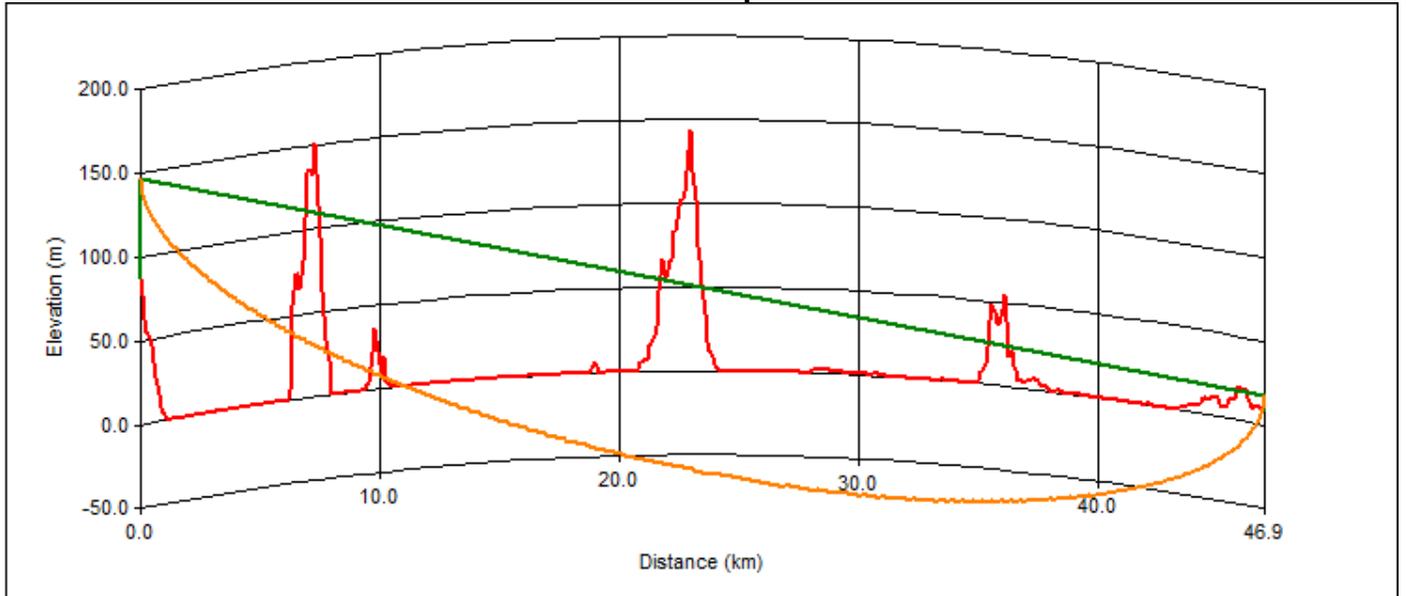
345 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

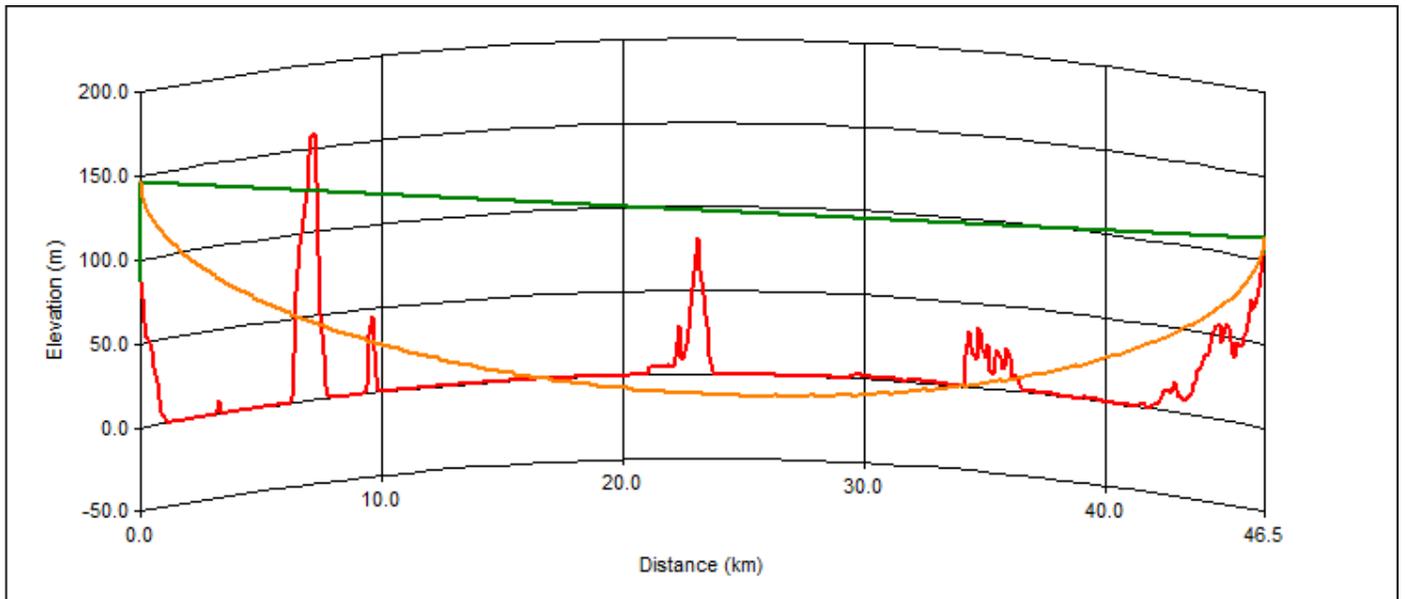
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346 Degree True Terrain Profile Graph.



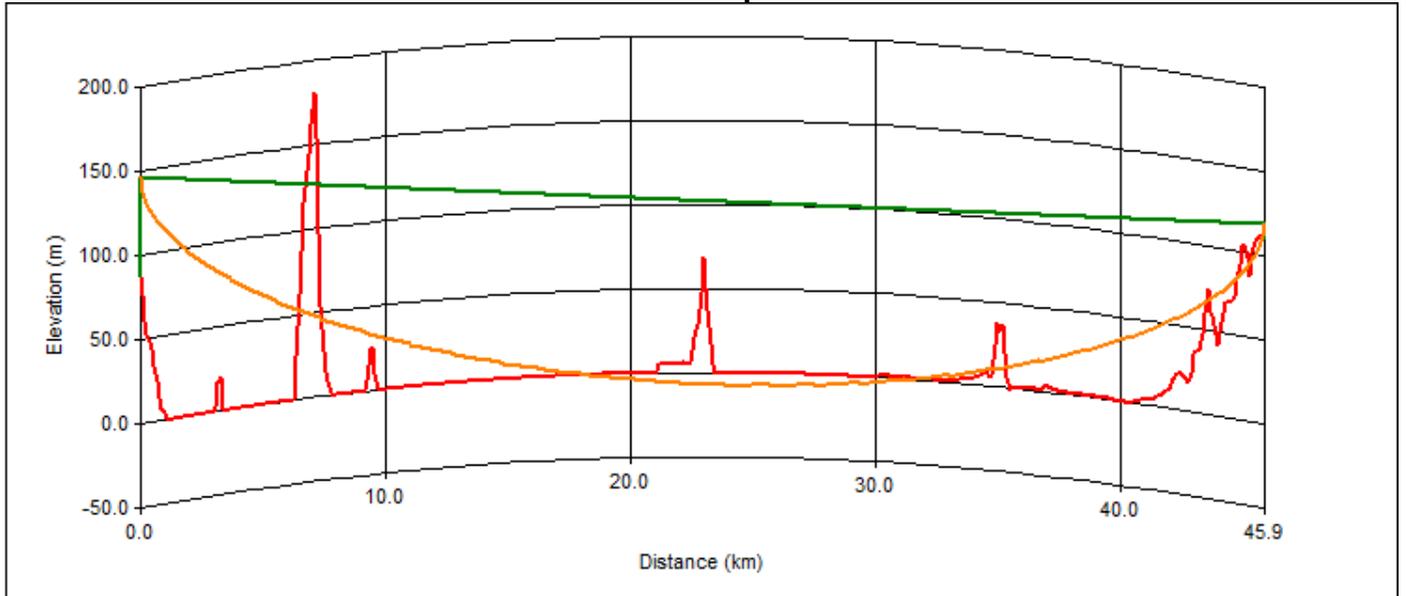
347 Degree True Terrain Profile Graph.

JEREMY RUCK & ASSOCIATES, INC.

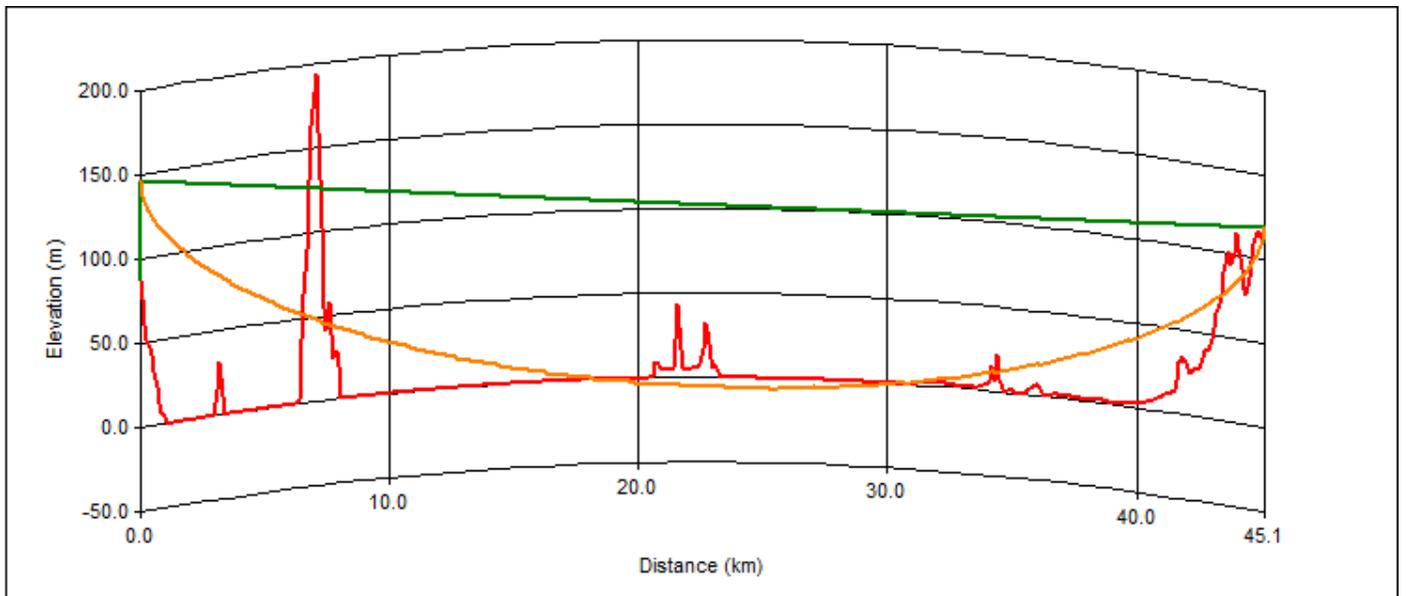
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348 Degree True Terrain Profile Graph.



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