



ENGINEERING STUDY

CP Modification

KKOI (FM)

NEW 202C3, Fac ID# 767598

Kahului, HI

Advanced Public Radio, Inc

September, 2023

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TECHNICAL STATEMENT

This technical statement and attached exhibits were prepared on behalf of Advanced Public Radio, Inc, (APR) in support of a modification of the construction permit for KKOI (FM), a NEW NCE FM station on Channel 202C3, licensed to Kahului, Hawaii on the Island of Maui. Facility ID# 767598.

The reason for the modification is that APR was able to secure a better tower site. Although the facility will drop in class from a C2 to a C3, this is solely due to the new location providing a lower HAAT. The proposed facility will still be more than 850 meters above the population and it will serve more population than the original proposal. Please note that the current construction permit for the new NCE station was not granted based on any coverage preference. Instead, the CP was granted as a "Singleton".

TECHNICAL PARAMETERS

Facilities Proposed

Location (NAD83)	20° 42' 07.5" N Latitude, 156° 21' 43.9" W Longitude
Channel	202C3 (88.3MHz)
Tower Overall AGL Height-	45.7m
Tower ASR	N/A (Existing tower owned by Pacific Media Group)
Proposed Antenna	6-level Jampro Java
Antenna AGL Height-	19m
Site AMSL Height-	848m
COR AMSL Height	867m
HAAT	133m
ERP	5.2kW-H, 3.5kW-V Directional (EXHIBIT A)

COMBINED OPERATION

KKOI will be combined on a common antenna with four other FM stations, KJKS, 260C1; KJMD, 252C2; KLHI-FM, 223C2, and KPOA, 228C1. A constant impedance combining system will be used and all appropriate spurious measurements will be taken prior to licensing.

BASIS OF CALCULATIONS

All exhibits and calculations in this application were prepared using the USGS National Elevation Dataset (NED) 3 Second US Terrain database unless otherwise noted. All population calculations were based on the 2010 *Census Block Data* from the US Bureau of Census¹.

POPULATION SERVED

The proposed NCE facility will serve a total population of 140,826. The original application and site covers 140,488 people (2010 Census). This proposal improves population coverage by 338 people.

47 CFR § 73.509 COMPLIANCE

As demonstrated in Exhibit B, the proposed NCE facility will utilize a directional antenna and will meet all contour protection requirements toward other stations as specified in 47 CFR § 73.509. Select protection contours are shown in Exhibits B1, B2, and B3. The FCC-compliant antenna pattern is shown in Exhibit A.

TV CHANNEL 6 PROTECTION

There are no full-power TV6 facilities within 257 km of the proposed facility; therefore, the proposed 202C3 at Kahului, HI is compliant with 73.525.

¹ As specified in FCC MB DA 21-885, Page 5, 6.

REASONABLE ASSURANCE

Reasonable assurance for the proposed tower was received by Chuck Bergson, Owner of Pacific Media Group and owner of the proposed tower.

DISPLACEMENT OF LPFM STATION

The new channel 202C3 will be first adjacent to an existing LPFM station, KAKU-LP, 203LP100. Unfortunately, KAKU-LP will be displaced.

COMMUNITY COVERAGE

As demonstrated in Exhibit C, the proposed facility will cover 100% of Kahului, HI in area and population with the 60dBu signal. Kahului comprises 15.2 sq km (land area) and as of the 2010 Census, the population of the city was 26,328.²

ENVIRONMENTAL CONSIDERATIONS

The proposed antenna will be attached to an existing tower. The tower is owned by Pacific Media Group. The tower is not registered.

The attachment of the proposed antenna will not alter the existing proposed tower structure for purposes of the Nationwide Programmatic Agreement and the NHPA Section 106. There will be four additional full-power stations on the proposed tower.

The proposed antenna will operate at a maximum power level of 5.2kW ERP Horizontal and 3.5kW Vertical and will operate at 19m AGL. APR proposes operating with a 6-level Jampro Java directional antenna. Based upon the FCC "FM Model"³ Power Density vs. Distance calculator using an "EPA Type 2, Opposed V Dipole" type antenna setting (closest to the computed vertical pattern), the maximum power density at 2m AGL contributed by the proposed antenna is expected to be

² https://en.wikipedia.org/wiki/Kahului,_Hawaii

³ <https://www.fcc.gov/general/fm-model>

9.5 μ W/cm² or 4.6% of the permitted 200 μ W/cm² limit for uncontrolled exposure. There are no tall buildings near the proposed tower. There will be several other non-excluded facilities operating on or near the proposed tower. Although the computed NIER is under 5% and excluded from further analysis for this facility, since this is a new tower site that will ultimately have at least six FM facilities operating, a field survey of the NIER in the area will be conducted to verify compliant operation, and, if necessary, appropriate fencing and marking will be added to the area of concern.

Based upon the preceding evaluation, the proposed antenna is believed to be excluded from further Environmental Assessment under 47CFR 1.1306 and 1.1307.

The proposed FM station and other users at the site will maintain an occupational safety policy and agree to reduce power or cease operation during maintenance periods to avoid potentially harmful exposure of personnel to non-ionizing RF radiation.

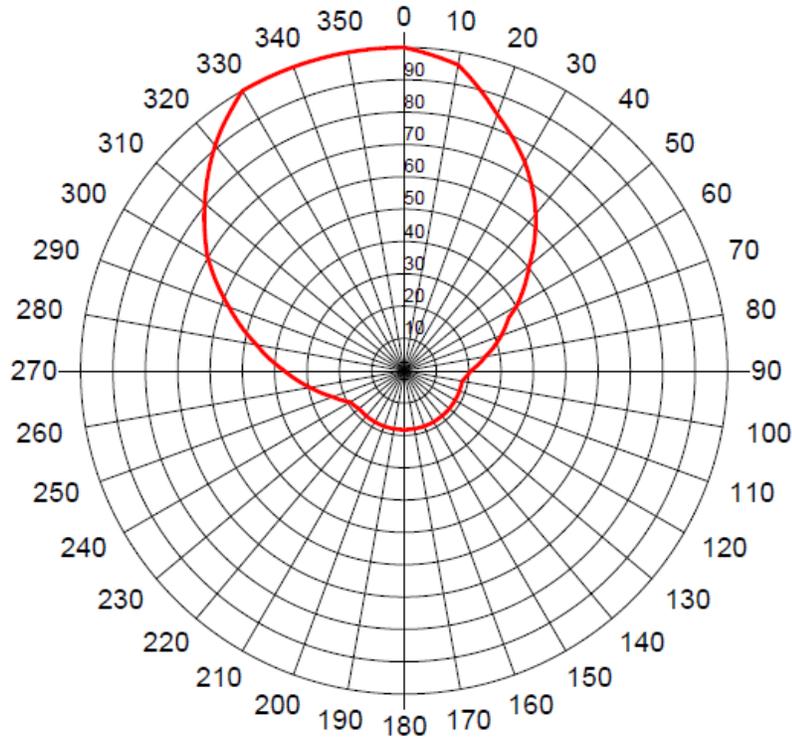
Respectfully Submitted

A handwritten signature in cursive script that reads "Bert Goldman". The signature is written in black ink and is positioned above the printed name and title.

Bert Goldman
Technical Consultant

EXHIBIT A- Antenna Pattern

KKOI 202C3 antenna pattern



Azi	Rel	dBk	kW	dB	Azi	Rel	dBk	kW	dB
0	1.000	7.16	5.200	0.00	180	0.182	-7.64	0.172	-14.80
10	0.961	6.81	4.802	-0.35	190	0.182	-7.64	0.172	-14.80
20	0.843	5.68	3.695	-1.48	200	0.182	-7.64	0.172	-14.80
30	0.746	4.61	2.894	-2.55	210	0.182	-7.64	0.172	-14.80
40	0.634	3.20	2.090	-3.96	220	0.182	-7.64	0.172	-14.80
50	0.505	1.23	1.326	-5.93	230	0.182	-7.64	0.172	-14.80
60	0.402	-0.76	0.839	-7.92	240	0.193	-7.13	0.194	-14.29
70	0.320	-2.74	0.532	-9.90	250	0.235	-5.42	0.287	-12.58
80	0.255	-4.71	0.338	-11.87	260	0.295	-3.44	0.453	-10.60
90	0.206	-6.56	0.221	-13.72	270	0.370	-1.48	0.712	-8.64
100	0.182	-7.64	0.172	-14.80	280	0.463	0.47	1.115	-6.69
110	0.182	-7.64	0.172	-14.80	290	0.576	2.37	1.725	-4.79
120	0.182	-7.64	0.172	-14.80	300	0.701	4.07	2.555	-3.09
130	0.182	-7.64	0.172	-14.80	310	0.805	5.28	3.370	-1.88
140	0.182	-7.64	0.172	-14.80	320	0.910	6.34	4.306	-0.82
150	0.182	-7.64	0.172	-14.80	330	1.000	7.16	5.200	0.00
160	0.182	-7.64	0.172	-14.80	340	1.000	7.16	5.200	0.00
170	0.182	-7.64	0.172	-14.80	350	1.000	7.16	5.200	0.00

Additional Points

Azi	Rel	dBk	kW	dB
63	0.363	-1.64	0.685	-8.80

EXHIBIT B- ALLOCATION STUDY (LMS)

ComStudy 2.2 search of channel 202 (88.3 MHz Class C2) at 20-42-07.7 N, 156-21-43.8 W.

CALL	CITY	ST CHN CL	DIST	SEP	BRNG	CLEARANCE	
KAKU-LP	KAHULUI	HI 203 LP100	22.38	80.00	334.4	-30.61 dB-	Will be displaced
KOPO-LP	PAIA	HI 205 LP100	23.70	53.00	355.0	-17.25 dB-	3rd Adjacent-OK
KIPH	HANA	HI 202 A	37.62	166.00	81.6	0.23 dB	Exhibits B
KHPR	HONOLULU	HI 201 C0	166.40	176.00	295.2	0.42 dB	Exhibits B
KLNY	LANAI CITY	HI 205 C2	57.89	58.00	285.6	2.22 dB	
KHPR	HONOLULU	HI 201 C0	166.81	176.00	295.3	9.69 dB	
KHPH	KAILUA	HI 204 C0	118.01	89.00	157.1	13.09 dB	
NCE-APP	WILLIAMSTON	NC 201 C3	165.44	117.00	299.2	18.41 dB	
KLHE	HILO	HI 201 A	175.39	106.00	129.1	32.79 dB	

EXHIBIT B Overall Contour Protections Map

KKOI 202C3, Kahului, HI, Contour Protections Overall

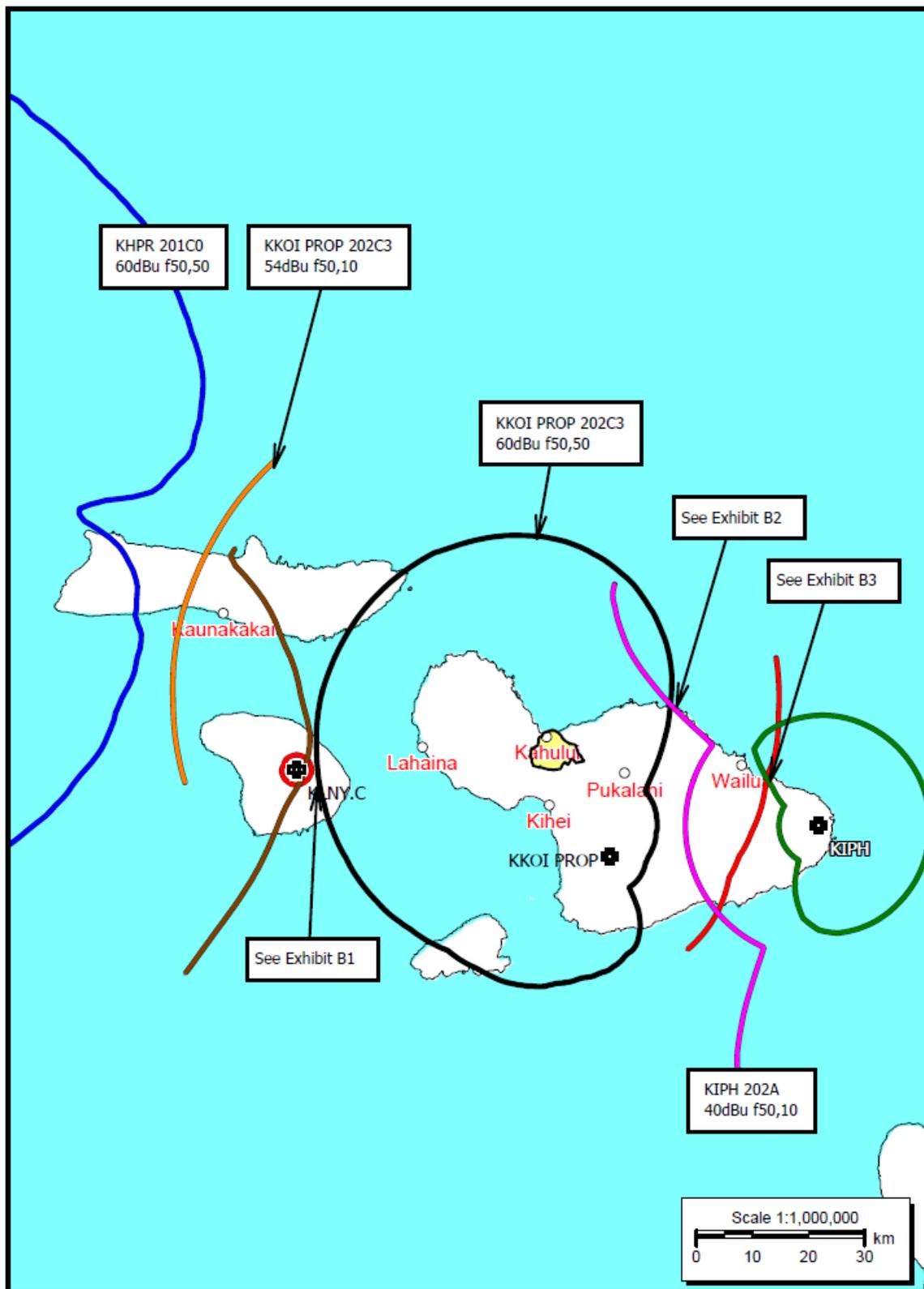


EXHIBIT B1- Contours KKOI, KHPR, KLNy

KKOI 202C3, Kahului, HI, Contour Protection, KHPR, KLNy (CP)

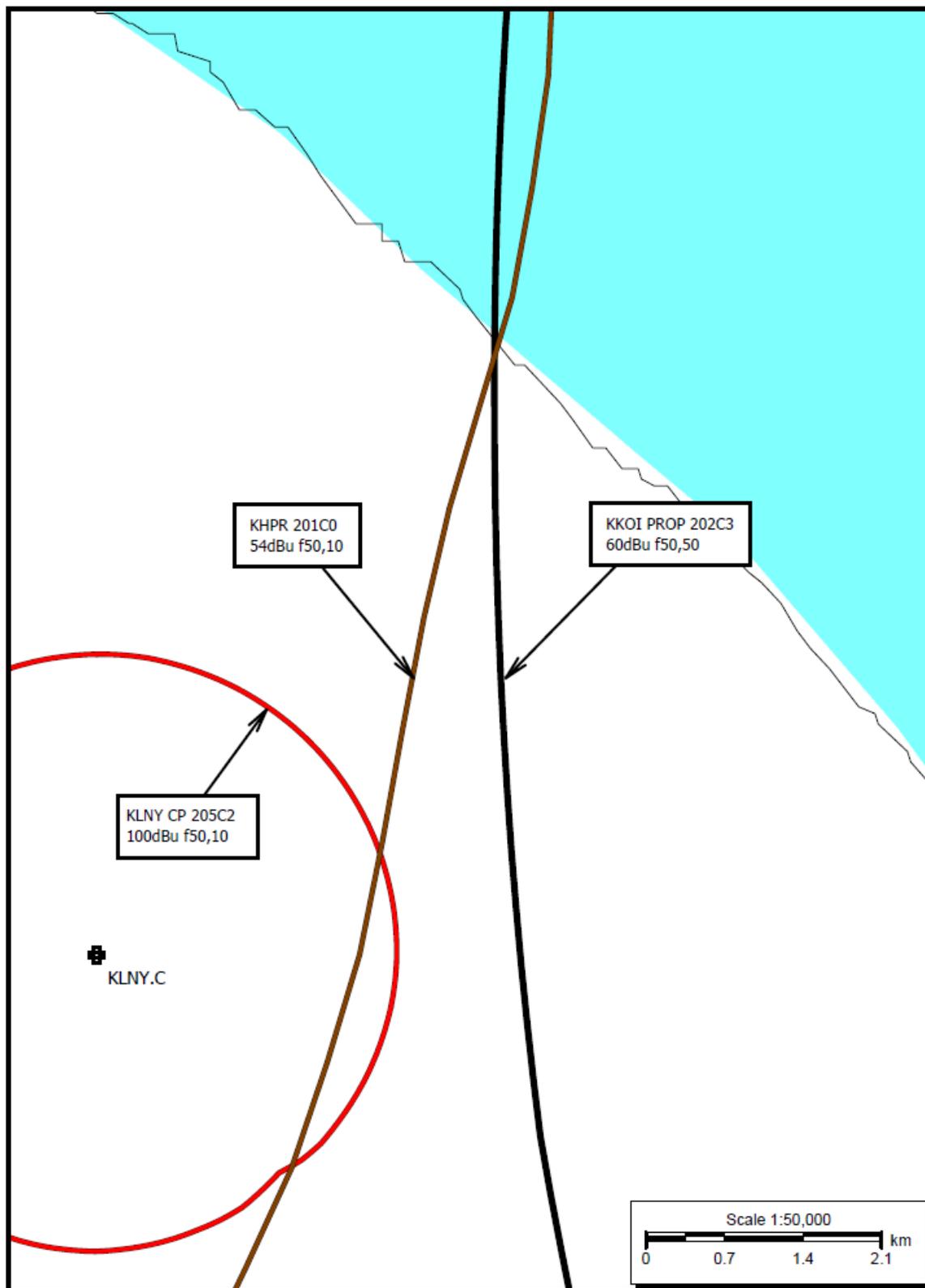


EXHIBIT B2- Protections KKOI from KIPH

KKOI 202C3, Kahului, HI, Contour Protection, KIPH Close

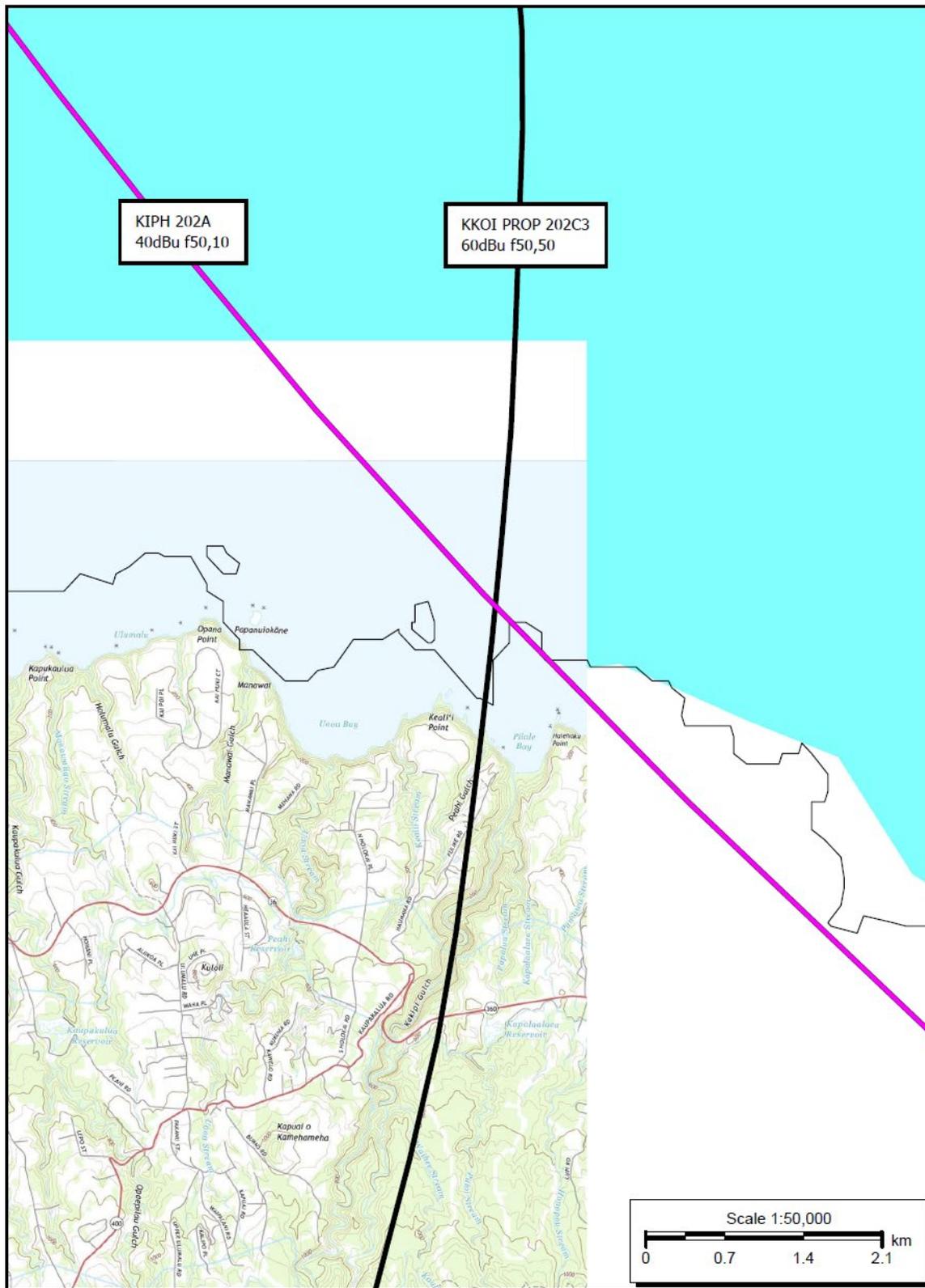


EXHIBIT B3- Protections KKOI to KIPH (Contours plotted using Google Earth)

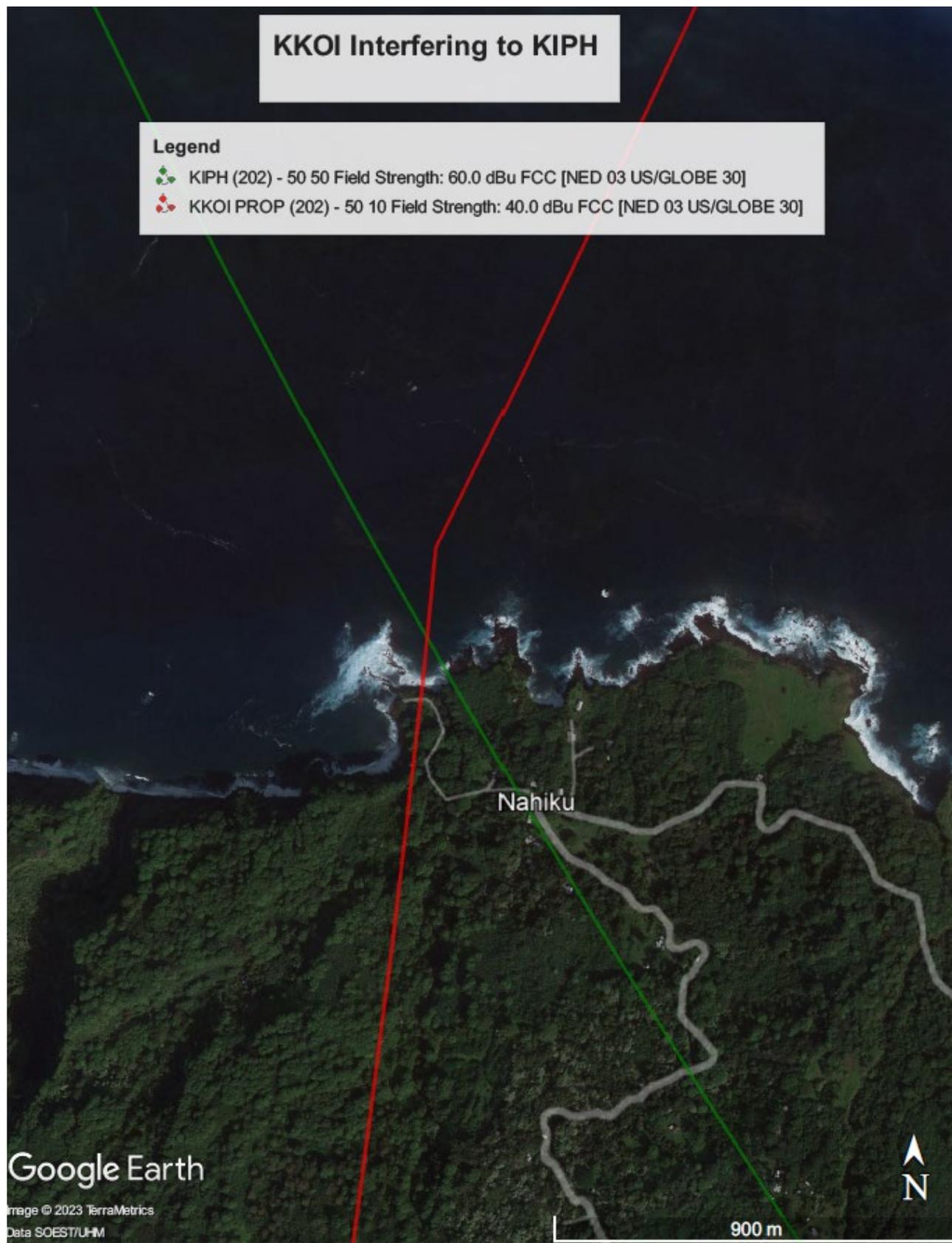


EXHIBIT C Community Coverage

PROP 202C3- Community Coverage, Kahului, HI

