March 29, 2021

*By Electronic Filing*

Paul E. Blais
Federal Communications Commission
445 12th St., SW
Washington, D.C. 20554

Re: IBFS File Nos. SES-MOD-20201204-01305, SES-MOD-20201204-01306, SES-MOD-20201204-01308, SES-MOD-20201204-01309 & SES-MOD-20201204-01310 (Call Signs E170163, E170164, E170153, E170165 & E170169)

Dear Mr. Blais:

HNS License Sub, LLC ("Hughes" or "HNS") submits this response to your letter, dated March 4, 2021 ("Letter"),[1] regarding the above-referenced applications ("Applications") to modify gateway earth stations licensed to operate in Cheyenne, WY, Bismarck, ND, Lindon, UT, Simi Valley, CA, and Quincy, WA. Specifically, Hughes provides the following information in response to your request for further demonstration of compliance with Section 25.136's criteria for compatibility with upper microwave flexible use service ("UMFUS") operations.

**Question #1**: *For each frequency band, demonstrate compliance with the numerical limits of earth stations within each county and partial economic area (PEA). When demonstrating compliance with regard to any PEA, please provide the PEA number, the counties associated with the PEA, and a list or table of any earth stations pending or licensed under section 25.136 within each such county as part of analysis required under 47 CFR §§ 25.136(a)(4)(i), 25.136(d)(4)(i) and 25.136(e)(4)(i).*

**Response #1**: Based upon a search of the Commission's license database, Attachment A provides a list of other earth stations licensed or proposed in each relevant county or PEA as of December 4, 2020, all of which are within Section 25.136's applicable numerical limits.

**Question #2**: *In accordance with 47 CFR §§ 25.136(a)(4)(ii), 25.136(d)(4)(ii) and 25.136(e)(4)(ii), specify whether and to what extent HNS is using a "clear sky power" value. Such demonstrations should take into account worst case input power density in addition to input power density during clear sky conditions. If*

[1] *See* Letter from Paul E. Blais, FCC, to Jennifer A. Manner, Hughes, IBFS File Nos. SES-MOD-20201204-01305 *et al.* (Mar. 4, 2021).

*relying on clear sky conditions, please explain why that assumption is appropriate for the specific circumstances and location.*

**Response #2**: As previously noted, the PFD contours for the proposed operations at each site were generated based upon assumed input power density levels during clear sky conditions,[2] consistent with International Bureau guidance.[3] As further noted, ITU-R P.618's recommended propagation model was used to account for clear, cloudy, and rainy weather conditions at each site to determine the percentage of time that the proposed gateway operations will remain within 1 dB of clear sky power levels.[4] These percentages of time are set forth in the table below, and further indicate correspondingly small percentages of time during which the proposed operations at each site will significantly exceed clear sky power levels. Consequently, by accounting for local weather conditions, the calculated percentages of time implicitly reflect fairly high probabilities of clear sky conditions at each site, and further demonstrate the reasonableness of assuming clear sky power levels at all five sites.

| **Gateway Site** | **28 GHz (% of Time)** | **47 GHz (% of Time)** |
|---|---|---|
| Bismarck | 96.42% | 88.54% |
| Quincy | 98.71% | 95.47% |
| Cheyenne | 98.15% | 93.91% |
| Lindon | 98.54% | 95.06% |
| Simi Valley | 98.21% | 94.06% |

**Question #3**: *In accordance with 47 CFR § 25.136(d)(4)(ii), provide a study of the maximum permitted population within -77.6 dBm/m2/MHz PFD contour of earth stations, as it relates to the associated PEA. All counties within the PEA should actually be addressed in this analysis in addition to the county where the earth station is located.*

**Response #3**: As further demonstration of compliance with Section 25.136(d)(4)(ii)'s applicable population limits, Attachment B provides additional information regarding estimated populations within the relevant PFD contours for the proposed operations in the 47.2-48.2 GHz ("47 GHz") band.

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[2] *See* Hughes, Applications, IBFS File Nos. SES-MOD-20201204-01305 *et al.*, Attachment B (UMFUS Compatibility Showing) (Dec. 4, 2020).

[3] *See International Bureau Issues Guidance on Siting Methodologies for Earth Stations,* Public Notice, 35 FCC Rcd 6347, 6349 (IB 2020).

[4] *See supra* note 2.

**Question #4**: *Pursuant to 47 CFR § 25.136(e)(4)(ii), provide a study of the maximum permitted population within -77.6 dBm/m2/MHz PFD contour of the earth stations outside of the grandfathered earth station location.*

**Response #4**: For the proposed operations in the 50.4-51.4 GHz ("50 GHz") band, Attachment C provides additional information regarding estimated populations within the relevant PFD contours outside of the contours at each grandfathered site.

**Question #5**: *As part of its analysis under 47 CFR §§ 25.136(a)(4)(iii), 25.136(d)(4)(iii) and 25.136(e)(4)(iii), HNS acknowledges that for the Lindon UT and Bismarck, ND stations there is PFD contour overlap of a major highway. If HNS plans to rely on terrain, clutter and/or shielding installation to comply with requirements of these rules, HNS should provide details and analysis about these method(s) and mitigating effects, how they will ensure compliance with the rules.*

**Response #5**: As previously noted, the PFD contours for the proposed operations in Lindon and Bismarck were generated using the propagation model in ITU-R P.452-16, which accounts for terrain and clutter loss.[5] Upon receipt of any complaint of actual interference occurring on a protected road within the relevant PFD contour, Hughes will take immediate corrective action, including installing shielding barriers to mitigate interference.

**Question #6**: *Confirm that frequency coordination has been completed using the applicable processes contained in 47 CFR 101.103(d), as set forth in 47 CFR § 25.136(d)(4)(iv). The Comsearch Coordination Report provided for the 47.2-48.2 GHz frequency band notes that coordination had been completed based 47 CFR § 25.136(a)(4)(iv), and not 47 CFR § 25.136(d)(4)(iv). Please confirm whether this was an administrative error and certify that frequency coordination was completed under 47 CFR 25.136(d)(4)(iv) for this frequency band. If Comsearch did not coordinate under 47 CFR § 25.136(d)(4)(iv), please revise the analysis accordingly and re-coordinate with the affected parties.*

**Response #6**: Hughes certifies that frequency coordination for the proposed 47 GHz operations was completed under Section 25.136(d)(4)(iv).

**Question #7**: *As part of its analysis under 47 CFR § 25.136(e)(4)(iv), provide a statement in the narrative about coordination efforts in the 50.4-51.4 GHz frequency band.*

**Response #7**: No coordination is required for the proposed 50 GHz operations because such operations are grandfathered under Section 25.136(e)(2). Additionally, there are no licensed or proposed UMFUS operations in the band.

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[5] *See* Hughes, Applications, IBFS File Nos. SES-MOD-20201204-01309 & SES-MOD-20201204-01310, Attachment B (UMFUS Compatibility Showing) (Dec. 4, 2020).

Please contact the undersigned with any further questions.

Sincerely,

*/s/ Jennifer A. Manner*
Jennifer A. Manner
Senior Vice President, Regulatory Affairs
Donna Wang
Principal Regulatory Engineer, Regulatory Affairs

Attachments

**ATTACHMENT A**
**OTHER EARTH STATIONS**

| Frequency Band | Gateway Site (City, State) | Relevant PEA No. | Relevant County or PEA Counties | Other Earth Stations Licensed or Proposed as of Dec. 4, 2020 (Licensee/Applicant – Call Sign) |
|---|---|---|---|---|
| 27.5-28.35 GHz | Cheyenne, WY | Not applicable | Laramie | Hughes – E150077<br>Viasat, Inc. – E010151 |
| | Bismarck, ND | Not applicable | Burleigh | Hughes – E150082 |
| | Lindon, UT | Not applicable | Utah | Hughes – E150086 |
| | Simi Valley, CA | Not applicable | Ventura | SES Americom, Inc. – E160022<br>WorldVu Satellites Limited – E190236 |
| | Quincy, WA | Not applicable | Grant | None |
| 47.2-48.2 GHz | Cheyenne, WY | 257 | Albany | None |
| | | | Campbell | None |
| | | | Converse | None |
| | | | Crook | None |
| | | | Laramie | None |
| | | | Niobrara | None |
| | | | Platte | None |
| | | | Weston | None |

**ATTACHMENT A**
**OTHER EARTH STATIONS**

| | | | | |
|---|---|---|---|---|
| | Bismarck, ND | 325 | Burleigh | None |
| | | | Morton | None |
| | Lindon, UT | 27 | Davis | None |
| | | | Salt Lake | None |
| | | | Tooele | None |
| | | | Utah | None |
| | | | Weber | None |
| | Simi Valley, CA | 2 | Kern | None |
| | | | Los Angeles | None |
| | | | Orange | None |
| | | | Riverside | None |
| | | | San Bernardino | None |
| | | | San Luis Obispo | None |
| | | | Santa Barbara | None |
| | | | Ventura | None |

**ATTACHMENT A**
**OTHER EARTH STATIONS**

| | | | | |
|---|---|---|---|---|
| | Quincy, WA | 206 | Adams | None |
| | | | Chelan | None |
| | | | Douglas | None |
| | | | Grant | None |
| | | | Kittitas | None |
| | | | Okanogan | None |
| 50.4-51.4 GHz | Cheyenne, WY | Not applicable | Laramie | None |
| | Bismarck, ND | Not applicable | Burleigh | None |
| | Lindon, UT | Not applicable | Utah | None |
| | Simi Valley, CA | Not applicable | Ventura | None |
| | Quincy, WA | Not applicable | Grant | None |

**ATTACHMENT B**

**Population Coverage of 47 GHz PFD Contours**

**Bismarck**

| PEA | County | County Pop. 2010 | Census Tract No. | Census Block No. | Census Block Pop. | Census Block Area ($m^2$) | Contour Coverage Area ($m^2$) | Weighted Pop. |
|---|---|---|---|---|---|---|---|---|
| 325 | Burleigh | 81308 | 11101 | 3011 | 127 | 24450 | 135 | 0.701227 |
| | | | 11101 | 3006 | 127 | 338821 | 40884 | 15.324516 |
| | | | 11105 | 1138 | 23 | 18792 | 320 | 0.391656 |
| | | | 11105 | 1161 | 6 | 173262 | 1984 | 0.0687052 |
| | | | 11101 | 3010 | 0 | 70090 | 2227 | 0 |
| | | | 11105 | 1136 | 0 | 919140 | 34 | 0 |
| | | | 11105 | 1146 | 0 | 126184 | 890 | 0 |
| | | | 11105 | 1169 | 27 | 50055 | 227 | 0.1224453 |
| | | | 11101 | 3009 | 2 | 4013 | 437 | 0.2177922 |
| | Morton | 27471 | N/A | N/A | N/A | N/A | N/A | N/A |
| **Total** | | **108,779** | | | | | | **17** |
| **Pop. Limit: 2,250** | | | | | | | | |

**Simi Valley**

| PEA | County | County Pop. 2010 | Census Tract No. | Census Block No. | Census Block Pop. | Census Block Area ($m^2$) | Contour Coverage Area ($m^2$) | Weighted Pop. |
|---|---|---|---|---|---|---|---|---|
| 2 | Ventura | 823318 | 007512 | 1020 | 443 | 1082348 | 16306 | 6.7 |
| | | | 007512 | 1021 | 0 | 32635 | 3 | 0 |
| | | | 007512 | 1024 | 0 | 12836 | 269 | 0 |
| | Kern | 839631 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Los Angeles | 9818605 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Orange | 3010232 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Riverside | 2470546 | N/A | N/A | N/A | N/A | N/A | N/A |
| | San Bernardino | 2180085 | N/A | N/A | N/A | N/A | N/A | N/A |
| | San Luis Obispo | 269637 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Santa Barbara | 446499 | N/A | N/A | N/A | N/A | N/A | N/A |
| **Total** | | **19,858,553** | | | | | | **7** |
| **Pop. Limit: 1,985,855.3** | | | | | | | | |

**Cheyenne**

| PEA | County | County Pop. 2010 | Census Tract No. | Census Block No. | Census Block Pop. | Census Block Area (m2) | Contour Coverage Area (m2) | Weighted Pop. |
|---|---|---|---|---|---|---|---|---|
| 257 | Laramie | 91738 | 000501 | 1004 | 2 | 688090 | 3543 | 0.0102981 |
| | | | 000501 | 1007 | 53 | 23062 | 2053 | 4.7181077 |
| | | | 000501 | 1039 | 55 | 21720 | 1165 | 2.950046 |
| | | | 000501 | 5008 | 78 | 42919 | 93 | 0.1690161 |
| | | | 002000 | 1131 | 0 | 320269 | 33896 | 0 |
| | | | 002000 | 1135 | 0 | 40850 | 1207 | 0 |
| | | | 002000 | 1143 | 0 | 282503 | 30075 | 0 |
| | Albany | 36299 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Campbell | 46133 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Converse | 13833 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Crook | 7083 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Niobrara | 2484 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Platte | 8667 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Weston | 7208 | N/A | N/A | N/A | N/A | N/A | N/A |
| **Total** | | **213,445** | | | | | | **8** |
| **Pop. Limit: 2,250** | | | | | | | | |

**Quincy**

| PEA | County | County Pop. 2010 | Census Tract No. | Census Block No. | Census Block Pop. | Census Block Area (m2) | Contour Coverage Area (m2) | Weighted Pop. |
|---|---|---|---|---|---|---|---|---|
| 206 | Grant | 89120 | 010500 | 1095 | 0 | 4425 | 117 | 0 |
| | | | 010500 | 1096 | 0 | 1166594 | 31220 | 0 |
| | | | 010500 | 1079 | 5 | 862810 | 5530 | 0.03 |
| | Adams | 18728 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Chelan | 72453 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Douglas | 38431 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Kittitas | 40915 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Okanogan | 41120 | N/A | N/A | N/A | N/A | N/A | N/A |
| **Total:** | | **300,767** | | | | | | **1** |
| **Pop. Limit: 2,250** | | | | | | | | |

**Lindon**

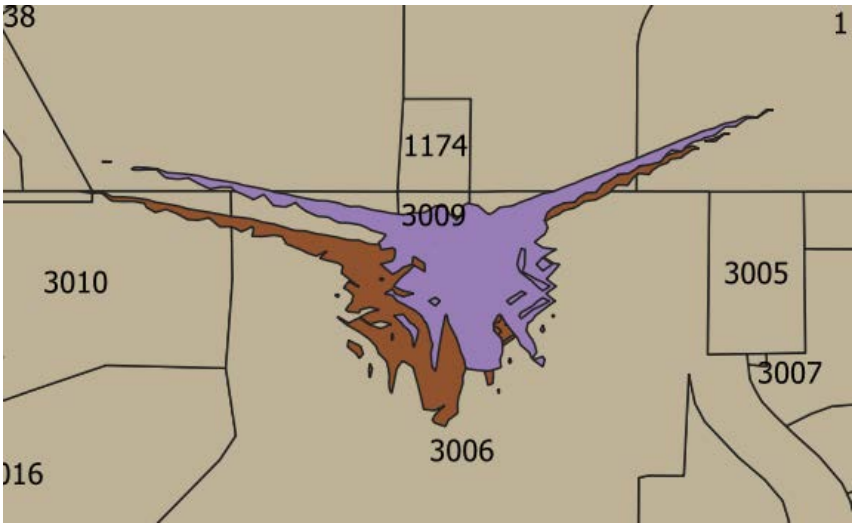
| PEA | County | County Pop. 2010 | Census Tract No. | Census Block No. | Census Block Pop. | Census Block Area (m2) | Contour Coverage Area (m2) | Weighted Pop. |
|---|---|---|---|---|---|---|---|---|
| 27 | Utah | 516564 | 000601 | 2015 | 0 | 89795 | 500 | 0.0 |
| | | | 000601 | 2018 | 69 | 257810 | 9986 | 2.7 |
| | | | 000601 | 2019 | 150 | 136871 | 2545 | 2.8 |
| | | | 000601 | 2022 | 0 | 211546 | 64382 | 0.0 |
| | Davis | 306479 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Salt Lake | 1029655 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Tooele | 52218 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Weber | 231236 | N/A | N/A | N/A | N/A | N/A | N/A |
| **Total:** | | **2,136,152** | | | | | | **6** |
| **Pop. Limit: 2,250** | | | | | | | | |

**ATTACHMENT C**

**Population Coverage of 50 GHz PFD Contours Outside Grandfathered Contours**

**Bismarck**

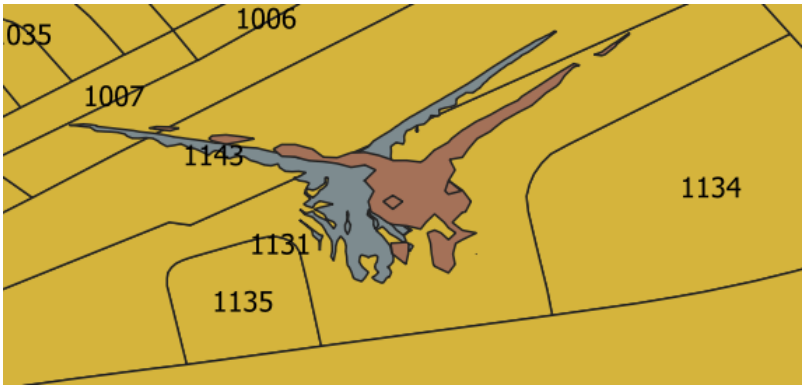
| PEA | County | Census Tract No. | Census Block No. | Census Block Pop. | Census Block Area ($m^2$) | Contour Coverage Area Outside Grandfathered Contour ($m^2$) | Weighted Pop. |
|---|---|---|---|---|---|---|---|
| 325 | Burleigh | 11101 | 3011 | 127 | 43884.624 | 28.332 | 0.081991451 |
| | | 11105 | 1146 | 0 | 129250.423 | 658.578 | 0 |
| | | 11101 | 3010 | 0 | 69204.372 | 1210.975 | 0 |
| | | 11105 | 1161 | 6 | 168048.118 | 523.876 | 0.0187045 |
| | | 11105 | 1161 | 6 | 168048.118 | 46.761 | 0.001669558 |
| | | 11105 | 1138 | 23 | 28073.985 | 1.223 | 0.00100196 |
| | | 11101 | 3006 | 127 | 354506.15 | 31788.897 | 11.38820841 |
| | Morton | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | **Total** | **11** |




**Brown is new, purple is old**

**Cheyenne**

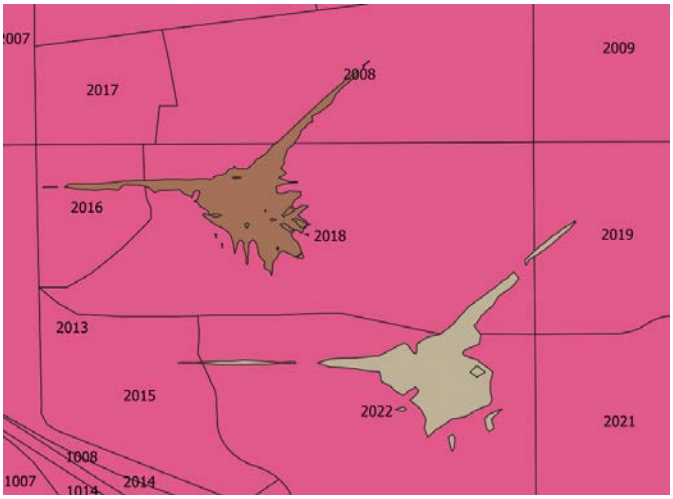
| PEA | County | Census Tract No. | Census Block No. | Census Block Pop. | Block Area ($m^2$) | Contour Coverage Area Outside Grandfathered Contour ($m^2$) | Weighted Pop. |
|---|---|---|---|---|---|---|---|
| 257 | Laramie | 2000 | 1131 | 0 | 320265.558 | 26749 | 0.0 |
| | | 2000 | 1143 | 0 | 283318.964 | 2408 | 0.0 |
| | | 501 | 1004 | 2 | 688089.722 | 108 | 0.0 |
| | Albany | N/A | N/A | N/A | N/A | N/A | N/A |
| | Campbell | N/A | N/A | N/A | N/A | N/A | N/A |
| | Converse | N/A | N/A | N/A | N/A | N/A | N/A |
| | Crook | N/A | N/A | N/A | N/A | N/A | N/A |
| | Niobrara | N/A | N/A | N/A | N/A | N/A | N/A |
| | Platte | N/A | N/A | N/A | N/A | N/A | N/A |
| | Weston | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | **Total** | **0** |




**Grey is old, Brown is new**

**Lindon**

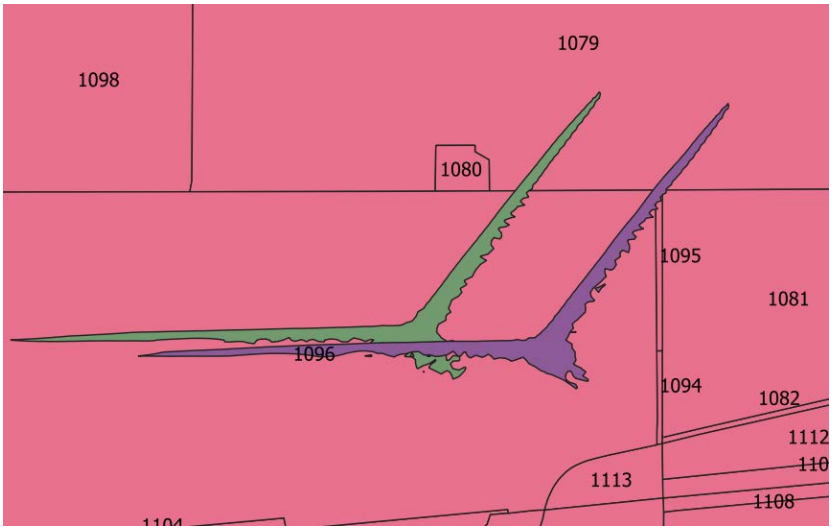
| PEA | County | Census Tract No. | Census Block No. | Census Block Pop. | Block Area ($m^2$) | Contour Coverage Area Outside Grandfathered Contour ($m^2$) | Weighted Pop. |
|---|---|---|---|---|---|---|---|
| 27 | Utah | 601 | 2018 | 69 | 257815.876 | 4274.211 | 1.143919 |
| | | 601 | 2022 | 0 | 211547.144 | 28392.134 | 0 |
| | | 601 | 2015 | 0 | 92982.734 | 54.987 | 0 |
| | | 601 | 2019 | 150 | 136868.995 | 826.263 | 0.905533 |
| | Davis | N/A | N/A | N/A | N/A | N/A | N/A |
| | Salt Lake | N/A | N/A | N/A | N/A | N/A | N/A |
| | Tooele | N/A | N/A | N/A | N/A | N/A | N/A |
| | Weber | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | **Total** | **2** |




**Brown is old, grey is new**

**Quincy**

| PEA | County | Census Tract No. | Census Block No. | Census Block Pop. | Census Block Area ($m^2$) | Contour Coverage Area Outside Grandfathered Contour ($m^2$) | Weighted Pop. |
|---|---|---|---|---|---|---|---|
| 206 | Grant | 10500 | 1079 | 5 | 884497.724 | 3665.441 | 0.02072 |
| | | 10500 | 1081 | 2 | 1452757.273 | 61.688 | 8.49E-05 |
| | | 10500 | 1095 | 0 | 4429.894 | 373.572 | 0 |
| | | 10500 | 1096 | 0 | 1182582.955 | 35871.23 | 0 |
| | | 10500 | 1079 | 5 | 884497.724 | 3665.441 | 0.02072 |
| | Adams | N/A | N/A | N/A | N/A | N/A | N/A |
| | Chelan | N/A | N/A | N/A | N/A | N/A | N/A |
| | Douglas | N/A | N/A | N/A | N/A | N/A | N/A |
| | Kittitas | N/A | N/A | N/A | N/A | N/A | N/A |
| | Okanogan | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | **Total** | **0** |




**Purple is old, green is new**

**Simi Valley**

| PEA | County | Census Tract No. | Census Block No. | Census Block Pop. | Census Block Area ($m^2$) | Contour Coverage Area Outside Grandfathered Contour ($m^2$) | Weighted Pop. |
|---|---|---|---|---|---|---|---|
| 2 | Ventura | 7512 | 1020 | 443 | 1084320 | 11375 | 4.647267412 |
| | | 7512 | 1021 | 0 | 32642 | 4964 | 0 |
| | | 7512 | 1024 | 0 | 12839 | 397 | 0 |
| | Kern | N/A | N/A | N/A | N/A | N/A | N/A |
| | Los Angeles | N/A | N/A | N/A | N/A | N/A | N/A |
| | Orange | N/A | N/A | N/A | N/A | N/A | N/A |
| | Riverside | N/A | N/A | N/A | N/A | N/A | N/A |
| | San Bernardino | N/A | N/A | N/A | N/A | N/A | N/A |
| | San Luis Obispo | N/A | N/A | N/A | N/A | N/A | N/A |
| | Santa Barbara | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | **Total** | **5** |

**orange is old, red is new**