

C-2 Report on Multiple Discrete Returns

The USGS Lidar Base Specification Version 1.3 states: "Deriving and delivering multiple discrete returns is required in all conventional lidar data collection efforts. Data collection shall be capable of at least three returns per pulse. Full waveform collection is acceptable and is promoted; however, full waveform data are regarded as supplemental information."

The purpose of this section is to report on the presence and quantities of lidar returns in the LAS data. Empty return columns can indicate a collection or processing problem dealing with lidar return attribute information.

[Data Source - Y:\Mapping\Projects\65220171_USGS-TX_West_Texas\Production\Final_Client_Deliverables\Lot6_utm13\point_cloud\Swaths](#)

File	First return	Second return	Third return	Other returns	Total points
01002.las	323,586,914	4,857,558	162,644	3,891	328,611,007
01003.las	295,061,654	4,463,258	135,041	2,728	299,662,681
01004.las	323,591,570	4,513,764	99,026	1,127	328,205,487
02053.las	144,118,547	1,063,316	12,879	40	145,194,782
02061.las	311,890,726	1,400,706	14,177	169	313,305,778
02076.las	458,695,871	2,904,163	27,026	81	461,627,141
02085.las	307,271,899	534,809	1,861	02	307,808,571
02091.las	293,650,251	1,271,740	5,411	06	294,927,408
02094.las	69,280,420	212,031	279	00	69,492,730
02100.las	308,947,410	2,394,938	26,887	119	311,369,354
02109.las	317,050,399	1,594,653	10,886	75	318,656,013
02127.las	85,199,541	8,364,124	746,295	22,911	94,332,871
02131.las	622,682,413	16,216,559	1,386,431	98,788	640,384,191
02135.las	443,834,711	2,568,596	23,661	100	446,427,068
02144.las	289,919,850	398,211	1,213	00	290,319,274
02148.las	290,573,306	798,289	2,229	02	291,373,826
02150.las	288,842,169	1,409,178	5,725	09	290,257,081
02153.las	60,776,331	281,816	698	00	61,058,845
02161.las	340,442,982	2,572,262	25,857	192	343,041,293
02165.las	330,254,824	1,661,643	11,168	109	331,927,744
02192.las	530,283,054	3,353,879	57,447	556	533,694,936
02195.las	91,098,537	7,613,658	814,004	43,298	99,569,497
02199.las	672,655,273	16,105,193	824,592	29,962	689,615,020
02201.las	611,065,969	3,627,938	22,740	126	614,716,773
02204.las	472,546,020	4,120,356	73,225	500	476,740,101

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02212.las	310,022,819	1,141,741	3,799	14	311,168,373
02213.las	300,252,220	501,114	1,222	04	300,754,560
02222.las	60,338,443	577,759	1,711	00	60,917,913
02231.las	309,283,253	2,193,478	16,543	50	311,493,324
02237.las	305,094,237	1,121,278	5,558	39	306,221,112
02263.las	594,551,039	5,765,800	172,702	2,258	600,491,799
02270.las	616,155,395	12,980,703	578,262	19,083	629,733,443
02275.las	315,625,262	2,573,249	50,053	380	318,248,944
02294.las	9,184,003	95,089	282	00	9,279,374
02303.las	328,954,532	2,651,124	29,100	395	331,635,151
02330.las	720,597,563	10,599,093	422,932	6,128	731,625,716
02337.las	665,799,099	11,105,561	281,070	2,149	677,187,879
02339.las	674,902,391	4,772,048	38,818	318	679,713,575
02352.las	298,746,777	1,021,127	4,389	13	299,772,306
02367.las	296,487,052	2,242,192	30,619	360	298,760,223
02393.las	603,626,476	14,147,900	722,387	10,680	618,507,443
02399.las	617,671,506	8,230,729	189,579	1,141	626,092,955
02401.las	608,518,237	4,501,254	38,271	259	613,058,021
02411.las	294,723,322	777,626	4,309	21	295,505,278
02427.las	324,590,609	3,005,777	60,885	915	327,658,186
02440.las	324,011,936	1,385,773	13,478	133	325,411,320
02451.las	737,019,626	22,073,355	1,146,490	14,716	760,254,187
02457.las	656,898,941	6,271,240	127,150	741	663,298,072
02459.las	658,325,488	4,528,304	37,088	281	662,891,161
02469.las	295,164,395	469,999	3,184	11	295,637,589
02485.las	300,652,522	3,689,865	92,377	1,736	304,436,500
02509.las	600,742,939	17,982,000	936,185	14,090	619,675,214
02514.las	616,524,325	5,158,484	80,471	471	621,763,751
02516.las	611,875,316	3,414,597	26,321	170	615,316,404
02525.las	286,474,464	377,515	1,402	02	286,853,383
02565.las	737,211,486	19,392,100	1,449,787	74,287	758,127,660
02570.las	661,571,526	4,817,581	65,907	425	666,455,439
02572.las	652,845,617	2,904,319	19,314	74	655,769,324
02616.las	606,673,965	17,554,797	3,684,392	646,207	628,559,361

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02621.las	637,191,347	4,084,384	52,118	291	641,328,140
02623.las	610,756,435	3,941,809	48,541	358	614,747,143
02664.las	717,609,421	26,846,570	5,671,195	730,297	750,857,483
02669.las	670,106,845	4,547,254	49,788	303	674,704,190
02671.las	644,495,602	4,883,948	74,560	649	649,454,759
02690.las	296,305,467	1,719,746	16,421	107	298,041,741
02711.las	605,586,977	23,049,964	5,261,084	777,732	634,675,757
02716.las	623,374,020	4,486,512	42,822	186	627,903,540
02717.las	617,665,261	5,360,846	118,351	1,113	623,145,571
02725.las	296,010,354	691,063	2,021	05	296,703,443
02756.las	716,765,922	23,894,965	4,321,180	582,685	745,564,752
02762.las	635,309,455	5,939,756	138,355	1,222	641,388,788
02770.las	294,251,825	806,759	1,841	02	295,060,427
02804.las	541,737,365	4,944,824	109,102	1,326	546,792,617
02812.las	296,318,649	719,971	1,609	00	297,040,229
02851.las	301,932,238	587,855	1,180	02	302,521,275
02886.las	285,473,848	414,395	1,704	11	285,889,958
03031.las	7,677,469	46,406	346	02	7,724,223
Total	33,083,005,922	411,294,236	30,739,657	3,098,633	33,528,138,448