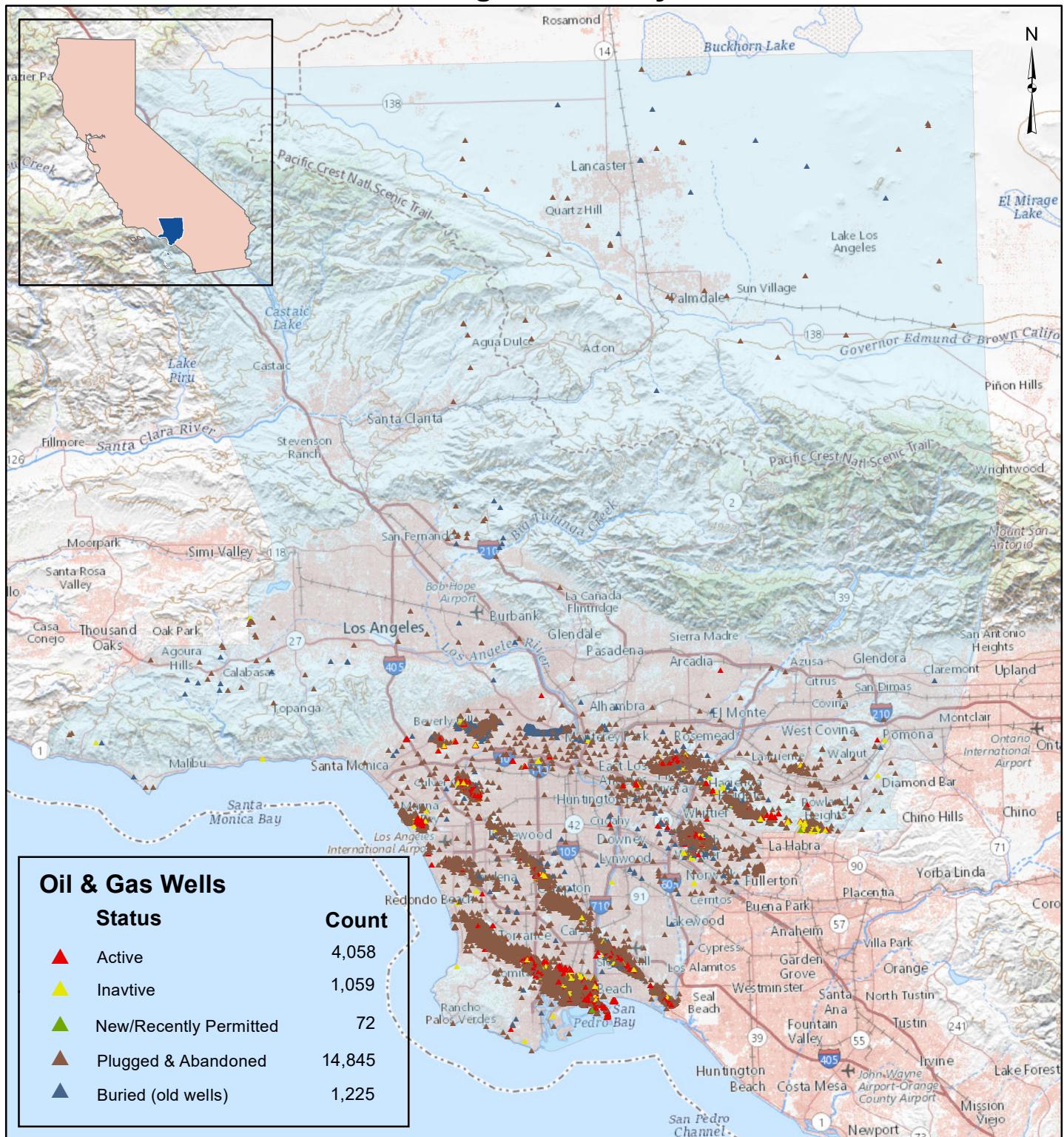


Map1: Distribution of Oil & Gas Wells

Los Angeles County



Scale: 1: 700,000

Subject Data Source: UCLA GEOG-XL7 Portal

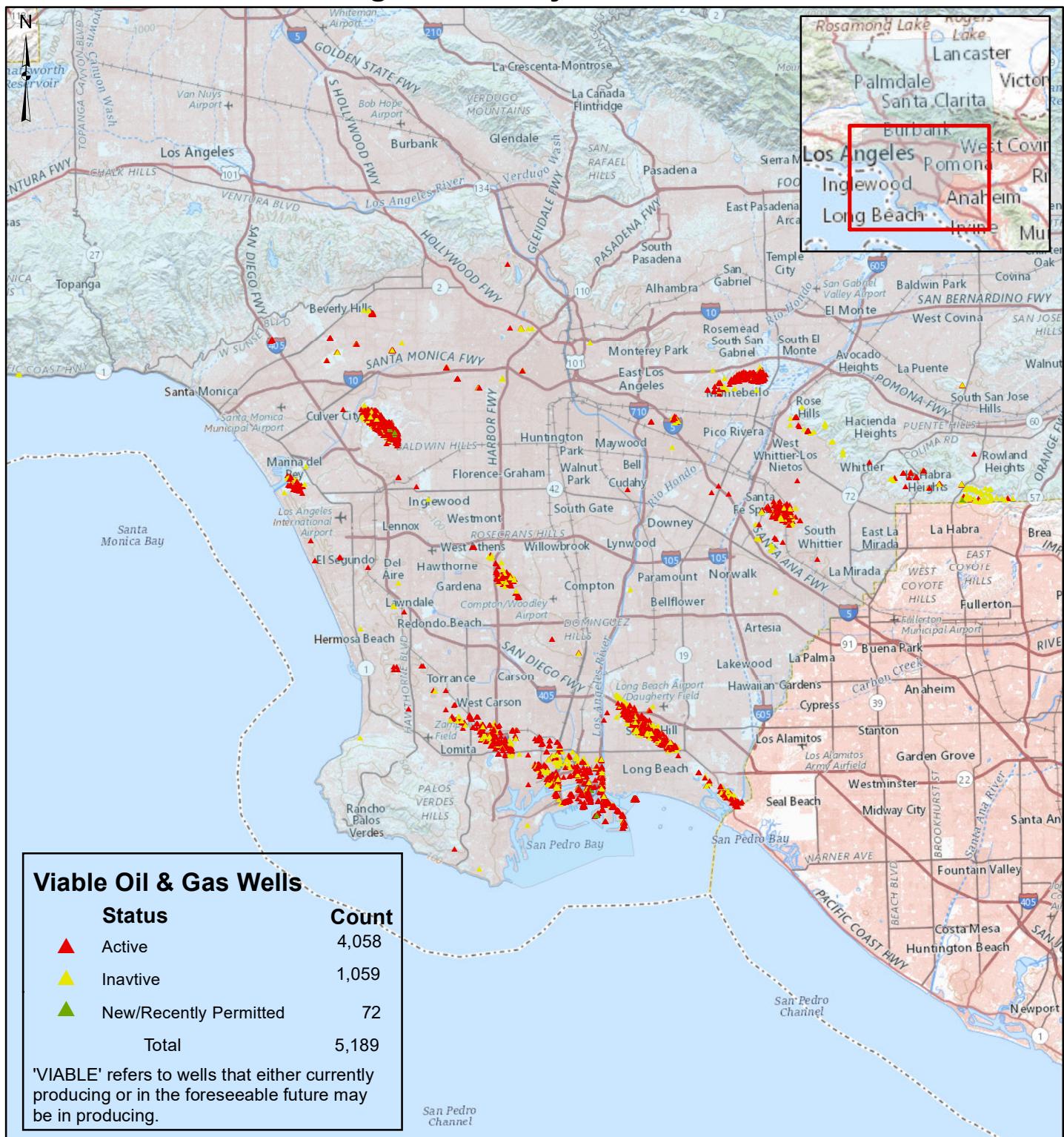
Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

Cartography by Dan Grady

Map2: Distribution of Viable Oil & Gas Wells

Los Angeles County - Close Detail



Scale: 1: 400,000

Subject Data Source: UCLA GEOG-XL7 Portal

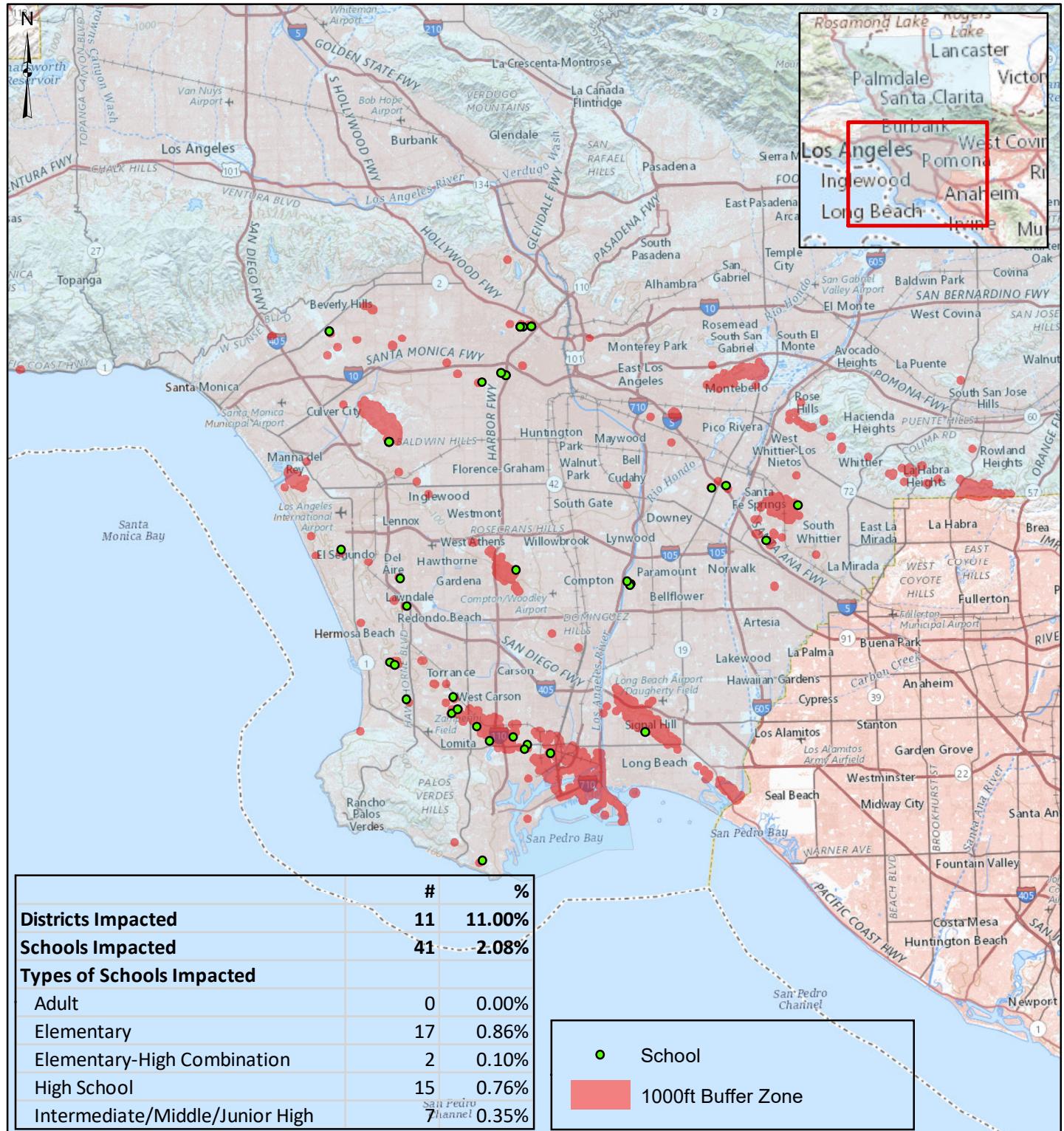
Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

Cartography by Dan Grady

Map3: Schools Within 1000ft of Viable O/G Well

Los Angeles County - Close Detail



Scale: 1: 400,000

Subject Data Source: UCLA GEOG-XL7 Portal

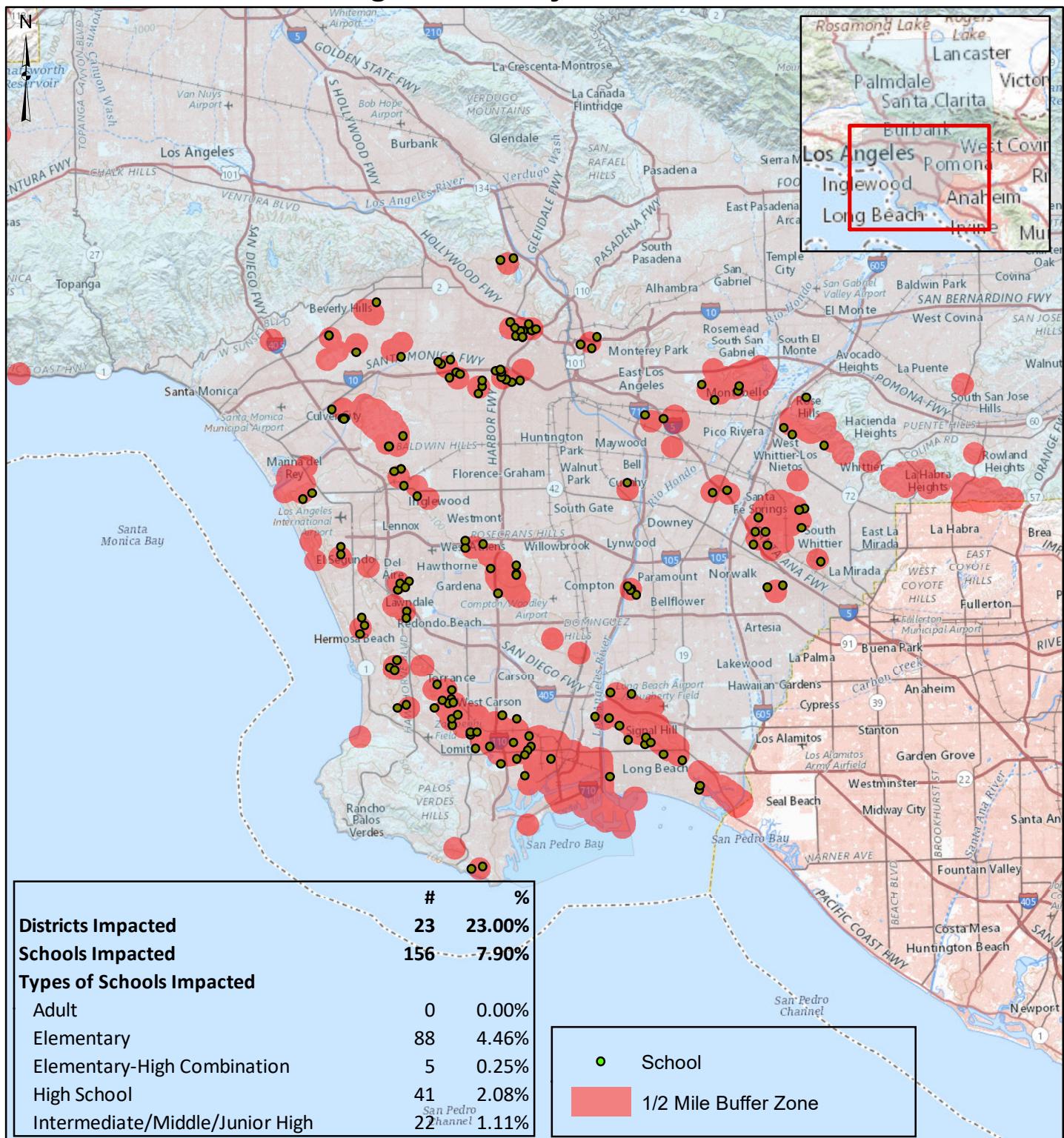
Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

Cartography by Dan Grady

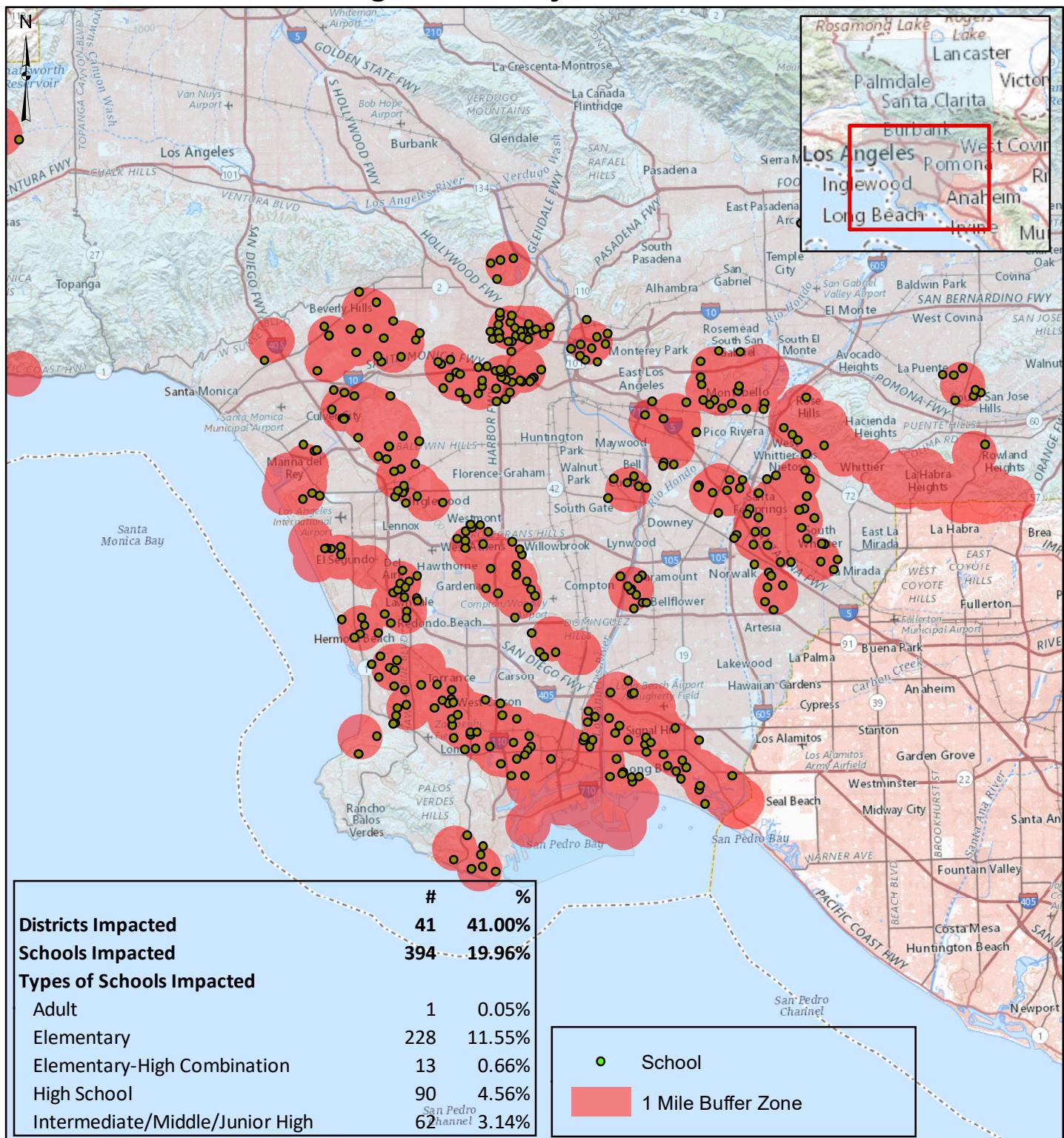
Map4: Schools Within 1/2 Mile of Viable O/G Well

Los Angeles County - Close Detail



Map5: Schools Within 1 Mile of Viable O/G Well

Los Angeles County - Close Detail



Scale: 1: 400,000

Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

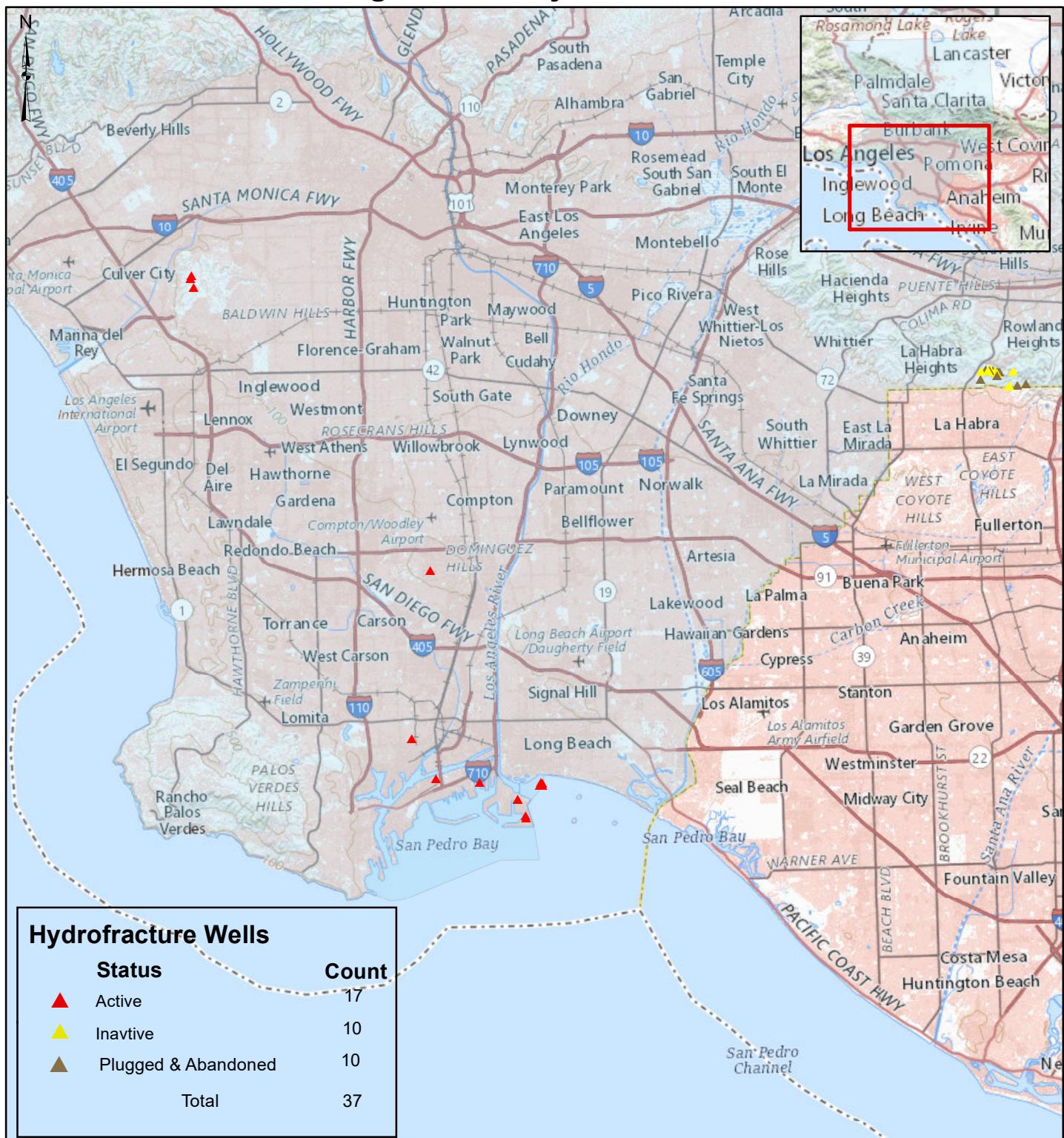
Subject Data Source: UCLA GEOG-XL7 Portal

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

Cartography by Dan Grady

Map6: Distribution of Hydrofracture Wells

Los Angeles County - Close Detail



Scale: 1: 300,000

Subject Data Source: UCLA GEOG-XL7 Portal

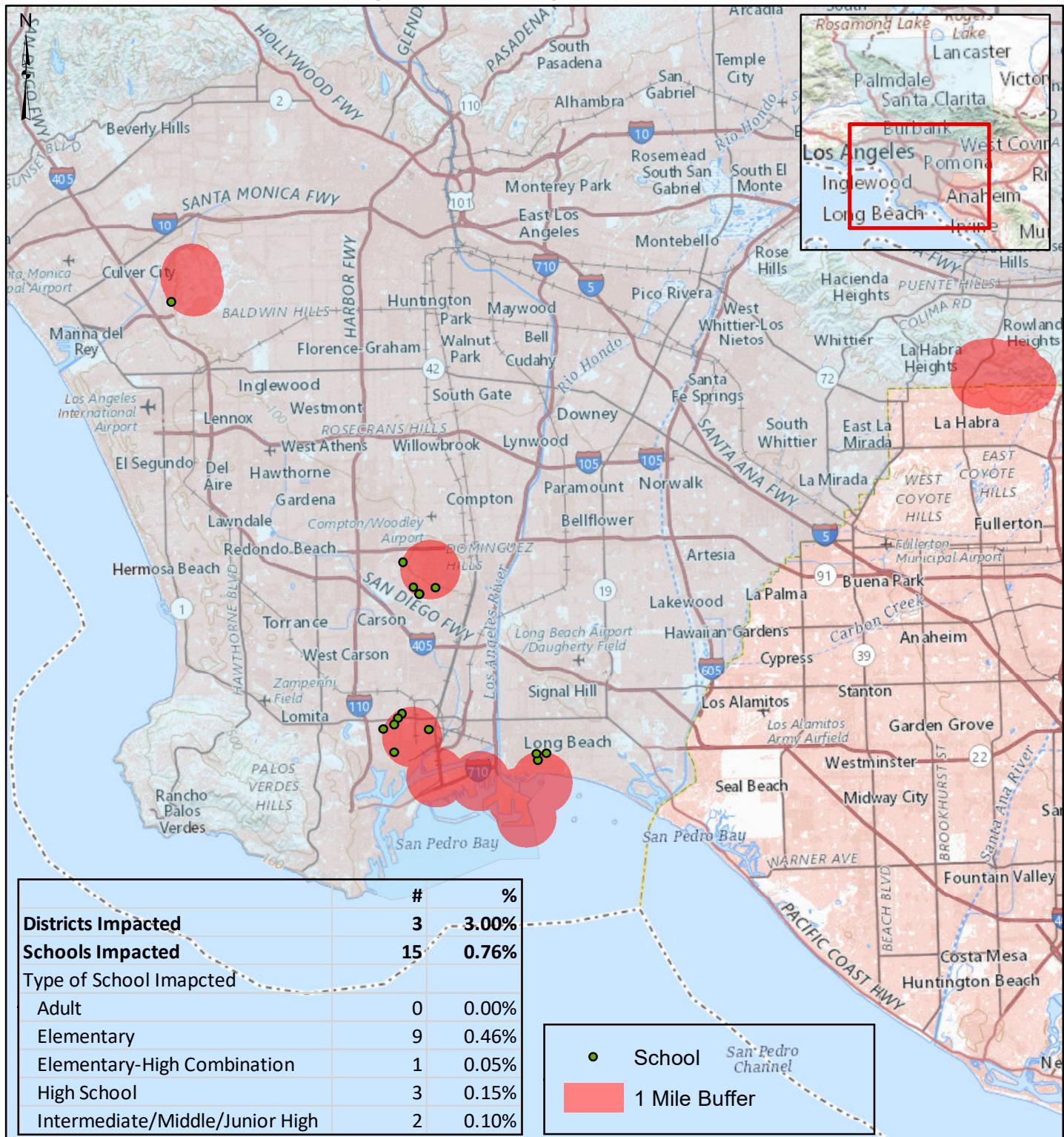
Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

Cartography by Dan Grady

Map7: Schools Within 1 Mile of Hydrofracture Well

Los Angeles County - Close Detail



Scale: 1: 300,000

Subject Data Source: UCLA GEOG-XL7 Portal

Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

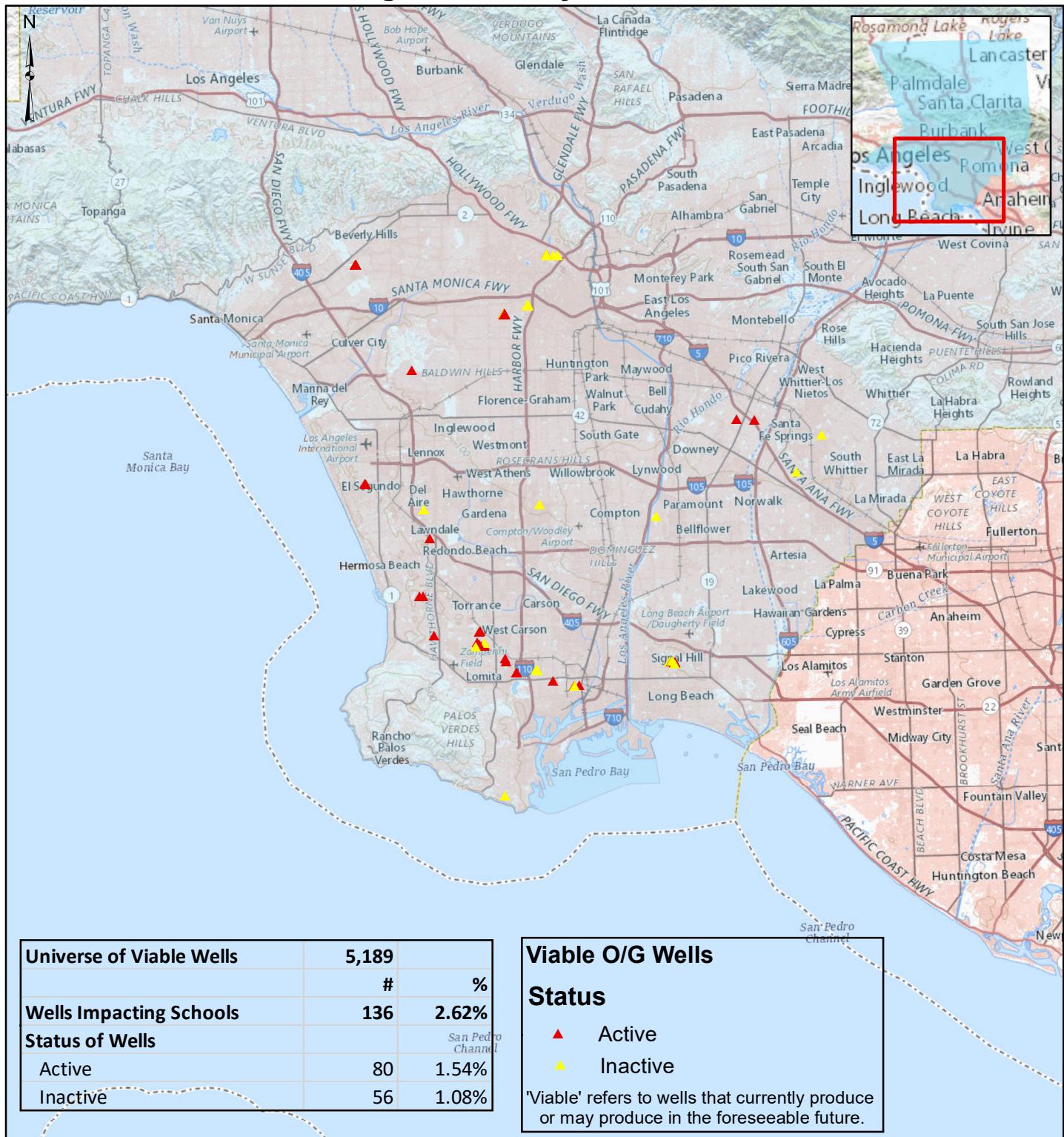
Cartography by Dan Grady

Schools Within 1 Mile of Hydrofracture Wells

District	School	Type
Culver City Unified	El Rincon Elementary	Elementary
Long Beach Unified	Chavez Elementary	Elementary
	California Academy of Mathematics and Science	High School
	Stevenson Elementary	Elementary
	Franklin Classical Middle	Intermediate/Middle/Junior High
Los Angeles Unified	George De La Torre Jr. Elementary	Elementary
	Magnolia Science Academy 3	Elementary-High Combination
	Phineas Banning Senior High	High School
	Avalon High	High School
	Annalee Avenue Elementary	Elementary
	Broadacres Avenue Elementary	Elementary
	Fries Avenue Elementary	Elementary
	Gulf Avenue Elementary	Elementary
	Wilmington Park Elementary	Elementary
	Glenn Hammond Curtiss Middle	Intermediate/Middle/Junior High

Map8: Viable O/G Wells Within 1000ft of a School

Los Angeles County - Close Detail



Scale: 1: 400,000

Subject Data Source: UCLA GEOG-XL7 Portal

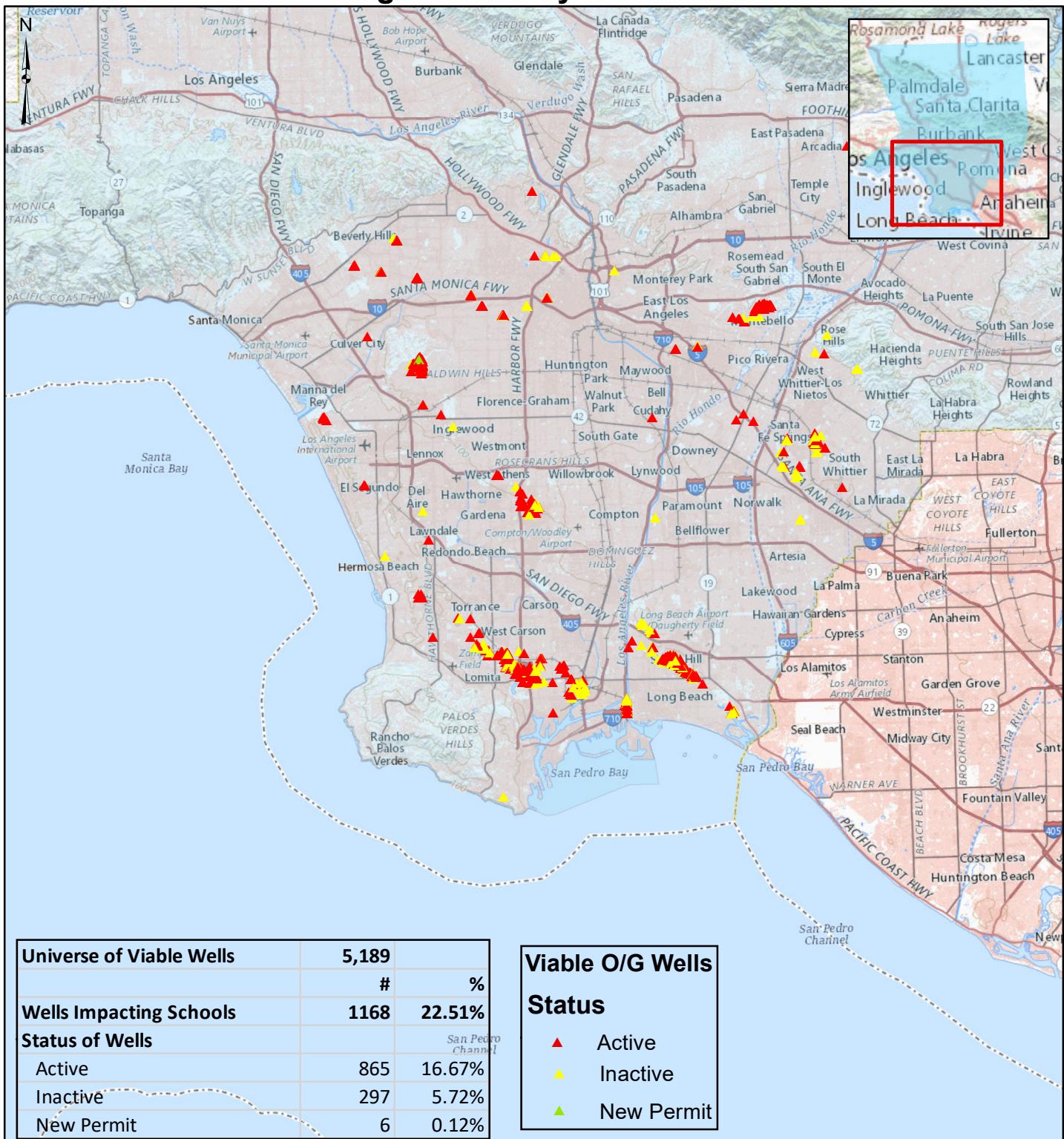
Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

Cartography by Dan Grady

Map9: Viable O/G Wells Within 1/2 Mile of a School

Los Angeles County - Close Detail



Scale: 1: 400,000

Subject Data Source: UCLA GEOG-XL7 Portal

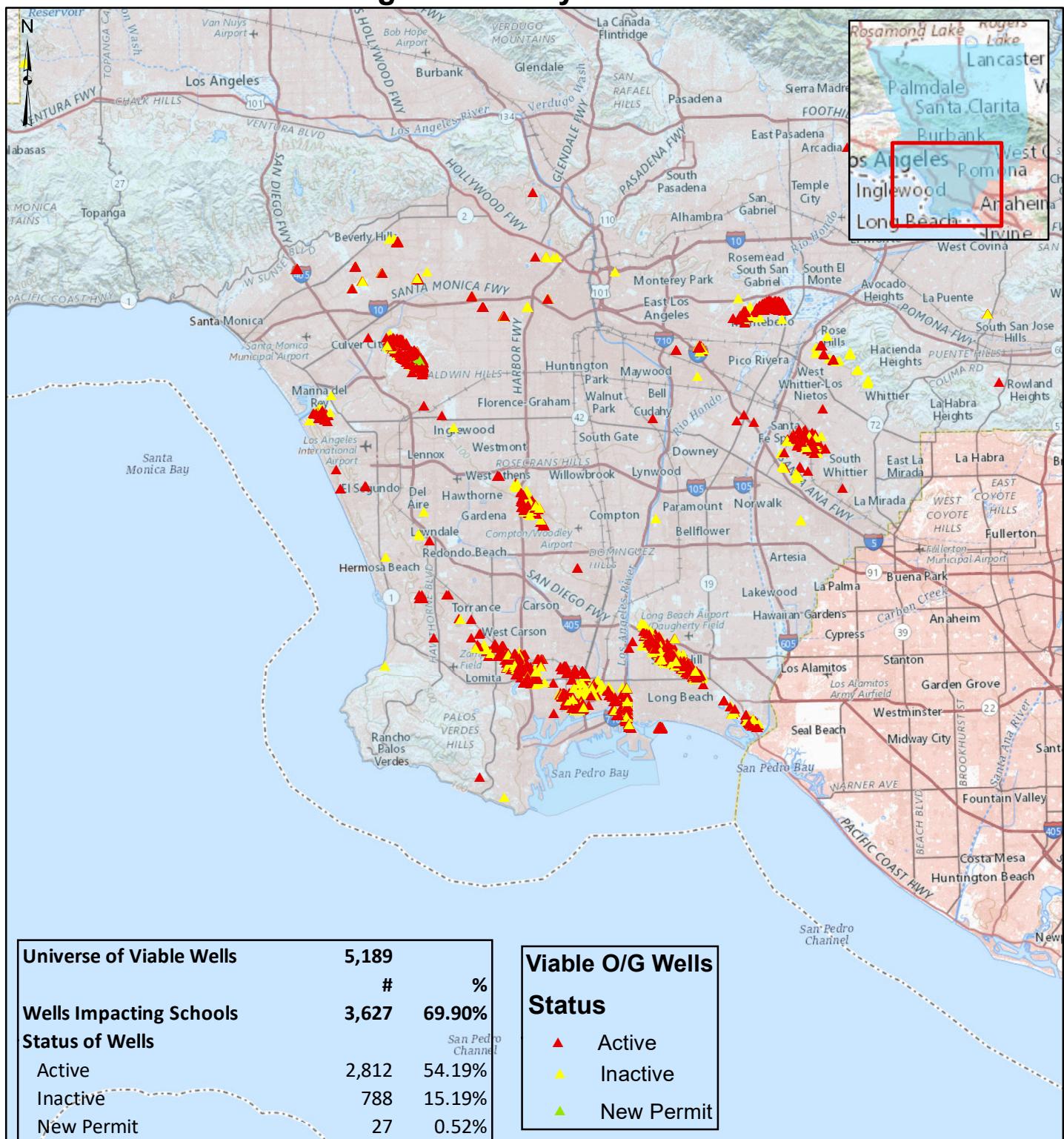
Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

Cartography by Dan Grady

Map10: Viable O/G Wells Within 1 Mile of a School

Los Angeles County - Close Detail



Scale: 1: 400,000

Subject Data Source: UCLA GEOG-XL7 Portal

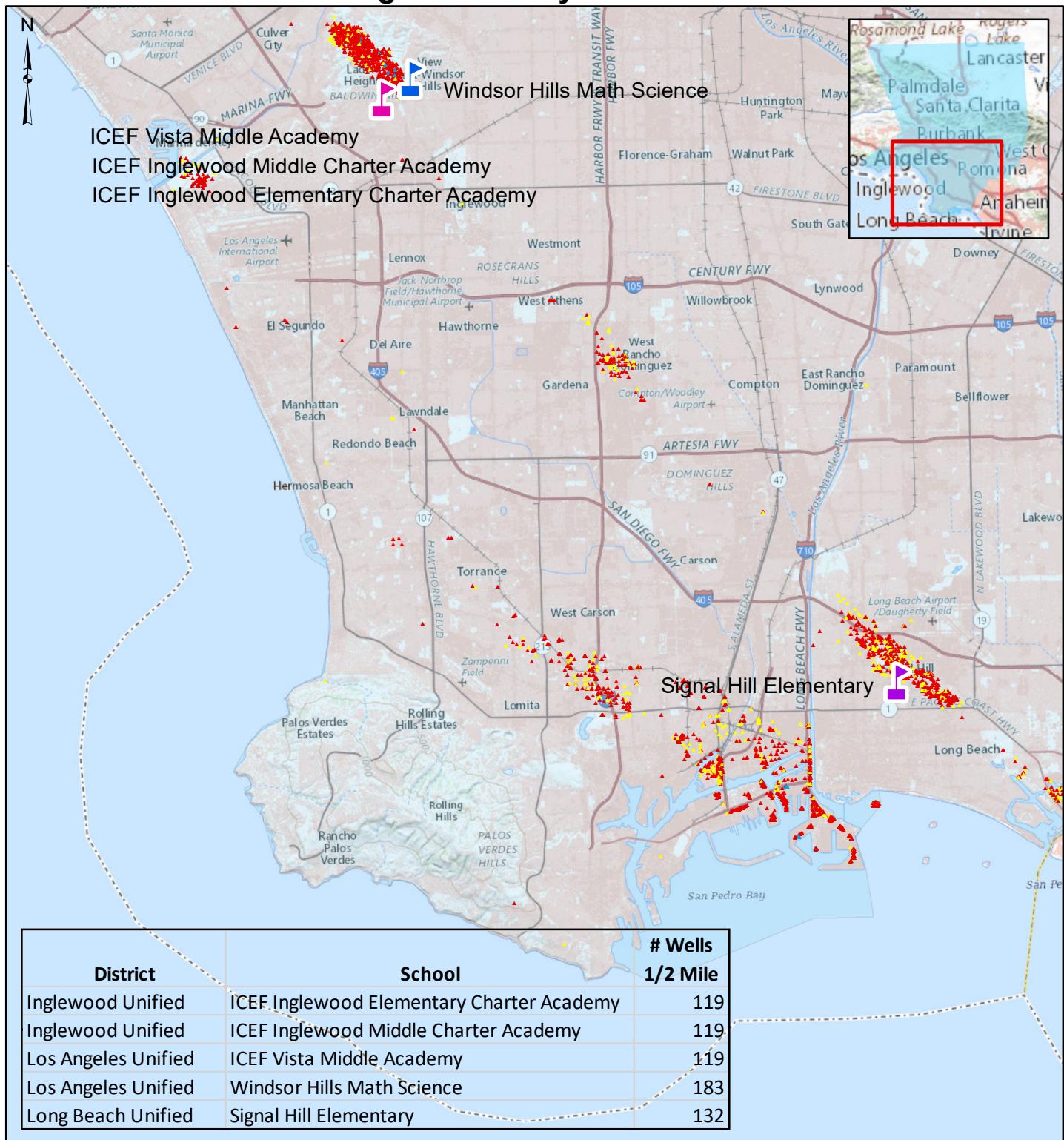
Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

Cartography by Dan Grady

Map11: 5 Schools Most at Risk

Los Angeles County - Close Detail



Scale: 1: 200,000

Subject Data Source: UCLA GEOG-XL7 Portal

Coordinate System: NAD 1983 California Teale Albers FtUS
Projection: Albers
Datum: North America 1983

Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2019.

Cartography by Dan Grady

UCLA
GEOG-XL7
Final Project
Submitted by Dan Grady

Methodology

Projection

Subject Source Data was presented in NAD 1983 California Teale Albers Meters. To facilitate User comprehension, the data was projected, along with an underlying service layer, into NAD 1983 California Teale Albers FtUS. This coordinate system and projection was used across all maps within the project.

Segmentation

Schools: Data was segmented as to “Type” and “School District”.

O/G Wells: Data was filtered to remove “Buried” (old wells) and “Plugged & Abandoned” to produce the ‘Viable’ data set. This was a judgment call by the analyst in order to address the nature of the report, Potential Public Hazards related to Oil & Gas Wells Near Schools. While any well, whether plugged and abandoned or otherwise, can present potential hazards, the relative hazard of these plugged and abandoned wells is presumed minimal. This filtering allows for a clearer presentation of features that present a greater hazard.

Additionally, O/G Wells were segmented on ‘Status’.

Map1: Distribution of Oil & Gas Wells

OGW data was plotted. Data was then segmented by Status and defined by color scheme. OGWdata status summarized and included with legend. A dataframe was added to provide geographic context as to the location of LA County.

Map2: Distribution of Viable Oil & Gas Wells

Map2 is a filter of Map1. The purpose is to remove the 15,000+ Buried(very old) and Plugged & Abandoned status wells that present little or very limited public safety concerns. The two status categories were removed and the filtered data re-plotted. The ‘Viable’ term was defined. As all ‘Viable’ wells are in the southern region of the county, the scale was increased to provide more detail and a dataframe was included to provide geographic context as to the zoomed in area.

Map3: Schools Within 1000ft of Viable O/G Well

A buffer layer of 1000ft was created on the OGW data. School data was then clipped using the buffer layer. Summary data for Districts and School Types was generated. Summary data was inserted through MS Worksheet object. A Report was generated.

Map4: Schools Within ½ Mile of Viable O/G Well

A buffer layer of ½ mile was created on the OGW data. School data was then clipped using the buffer layer. Summary data for Districts and School Types was generated. Summary data was inserted through MS Worksheet object. A Report was generated.

Map5: Schools Within 1 Mile of Viable O/G Well

A buffer layer of 1 mile was created on the OGW data. School data was then clipped using the buffer layer. Summary data for Districts and School Types was generated. Summary data was inserted through MS Worksheet object. A Report was generated.

Map6: Distribution of Hydrofracture Wells

OGW data was plotted. Data was then segmented by Status and defined by color scheme. OGWdata status summarized and included with legend. A dataframe was added to provide geographic context as to the location of LA County.

Map7: Schools Within 1 Mile of Hydrofracture Wells

A buffer layer of 1 mile was created on the OGW data. School data was then clipped using the buffer layer. Wells status was segmented and summary data was generated. Summary data was inserted through MS Worksheet object. A Report was generated.

Map8: Viable O/G Wells Within 1000ft of School

A buffer layer of 1000ft was created on the School data. School data was then clipped using the buffer layer. Wells status was segmented and summary data was generated. Summary data was inserted through MS Worksheet object. A Report was generated.

Map9: Viable O/G Wells Within ½ Mile of School

A buffer layer of ½ mile was created on the School data. School data was then clipped using the buffer layer. Wells status was segmented and summary data was generated. Summary data was inserted through MS Worksheet object. A Report was generated.

Map10: Viable O/G Wells Within 1 Mile of School

A buffer layer of 1 mile was created on the School data. School data was then clipped using the buffer layer. Wells status was segmented and summary data was generated. Summary data was inserted through MS Worksheet object. A Report was generated.

Map11: 5 Schools Most at Risk

From Analysis Tools, Proximity Tool Box, the Generate Near Table tool was used to calculate the number of wells located within ½ mile of a school. This was then sorted and summarized to identify 5 schools located within ½ mile of more than 100 viable well sites.

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Final Project
Submitted by Dan Grady

Assessment of Proximity of Oil & Gas Wells to Schools in Los Angeles County

By the Numbers:

Total School Districts	100	Schools Within Distance of Wells					
Total Schools	1,974	1000 ft	% of Total	½ mile	% of Total	1 mile	% of Total
Adult	1	0	0.00%	0	0.00%	1	0.05%
Elementary	1,227	17	0.86%	88	4.46%	228	11.55%
Elementary-High Combination	63	2	0.10%	5	0.25%	13	0.66%
High School	399	15	0.76%	41	2.08%	90	4.56%
Intermediate/Middle/Junior High	284	7	0.35%	22	1.11%	62	3.14%
Sub-total		41	2.08%	156	7.90%	394	19.96%
Schools Within Distance of Hydrofracture Wells							
Total Schools	1,974	1000 ft	% of Total	½ mile	% of Total	1 mile	% of Total
Adult	1					0	0.00%
Elementary	1,227					9	0.46%
Elementary-High Combination	63					1	0.05%
High School	399					3	0.15%
Intermediate/Middle/Junior High	284					2	0.10%
						15	1.10%
Wells Within Distance of Schools							
Oil & Gas Wells – All	21,259	1000 ft	% of Viable	½ mile	% of Viable	1 mile	% of Viable
Viable Wells (A, I, N)	5,189						
Active	4,058	80	1.54%	865	16.67%	2,812	54.19%
Inactive	1,059	56	1.08%	297	5.72%	788	15.19%
New Permit	72	0	0.00%	6	0.12%	27	0.52%
Plugged & Abandoned	14,845						
Buried (old well)	1,225						
Sub-total		136	6.89%	1,168	59.17%	3,627	69.90%
Hydrofracture (subset of ALL)	37						
Active	17						
Inactive	10						
Plugged & Abandoned	10						

Close proximity to oil/gas wells can present hazards to humans, most notably from unintended emissions of hazardous gases. While all wells can create these hazards, hydrofracture wells, which introduce highly pressurized silica to fracture the substrate, can be especially susceptible to unintended emissions. These emissions can cause serious respiratory risks.

The 41 school districts, with 394 schools, are impacted by this issue. (See Map 5)

The health risks associated with proximity to oil and gas wells is not easily remedied. The southern region of LA County has been heavily exploited over the years with more than 20,000 well site recorded. Currently, there are 5,189 viable oil and gas wells, that is wells that are actively producing or capable of producing in the near future. There are over 15,000 old, buried wells (pre-regulation) and plugged and abandoned wells. (See Maps 1-3) Over these viable wells, 3,627 (69%) are within 1 mile of a school. 136 wells are within 1000ft of a school. (See Maps 8-10)

Almost 20% of all schools in L.A. County are within 1 mile of a viable oil/gas well. This is 394 schools with some level of exposure to unintended emission. It is interesting to note that of the 394 schools, 228 (58%) are elementary.(See Maps 3-5).

Fortunately, only 15 schools, 1.10%, are within 1 mile of a hydrofracture well. While the overall number of schools is low, again, it is important to note that of the 15 schools, 9 schools are elementary. The young students in elementary may be more susceptible to these respiratory risks. (See Maps 6-7)

Highly alarming is the fact that 5 schools have over 100 oil/gas wells within 1 mile of their location. More disturbing is that all 5 schools are elementary schools. Windsor Mills Math & Science has 183 viable well sites within 1 mile. (See Map 11)