Life Under the Desert Sun,
Dust Storms, Steam Baths and Outhouses for the Unencumbered Desert Dweller.

by Elizabeth Gálvez

Bachelor of Science in Design, Architectural Studies and Philosophical Studies
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for the degree of Master of Architecture at the Massachusetts Institute of Technology.

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Life Under the Desert Sun,
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by Elizabeth Gálvez

Yesterday’s desert is today your new home, is tomorrow’s strip mall. The West remains the American ‘way out’ a chance to reinvent oneself, ‘to make it’. Yet, the desert landscape is fraught with the politics of displacement, exploitation, and imposition, carrying with it a socio-political dimension. Our collective imprint on this uniquely American geographic region is staggering. Going west- symbolizing the quest for freedom and opportunity is ‘seen’ as the place to reinvent oneself regardless of the obvious damage that occurs when we choose to also relocate our un-revised modalities for living-our lifestyle- within this context.

This thesis seeks to investigate a particular condition: the proliferation of the single-family suburban house within the American Desert context in conjunction with aesthetics of the American Dream, desire, and leisure. Life Under the Desert Sun proposes the re-invention of suburban living in the American Desert based on two metrics: [1] an embrace of arid living via a reduction in the water consumptive lifestyle due to a lack of water availability and [2] the logic, success, and desirability of the mass produced single-family home. This condition of spreading suburban housing within ‘affordable’ desert regions houses over 20 Million Americans. The proposal focuses on the area of southern California within the Antelope Valley at the edge of both the Los Angeles Metro Area and the Mohave Desert, as the region is now facing an extreme drought condition, for the fifth year.

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A housing development in Cathedral City, near Palm Springs;
Image: Damon Winter/The New York Times
Yesterday’s desert is today your new home, is tomorrow’s strip mall. The West remains the American “way out” a chance to reinvent oneself, “to make it”. Yet, the desert landscape is fraught with the politics of displacement, exploitation, and imposition carrying with it a socio-political dimension. Our collective imprint on this uniquely American geographic region is staggering.

While “the west” is seen (in books like Banham’s America Deserta and The Desert by Van dyke, or events like burning man) as far out, unfamiliar, exotic, and exiting, when we do locate here, we turn our back on that aesthetic and rather transpose our customs and modalities. Going west- symbolizing the quest for freedom and opportunity is “seen” as the place to reinvent oneself regardless of our un-revised modalities for living in an arid place. Greening the desert into an oasis by way of the lawn, golf course, and swimming pool can be seen as the prime ideology in many suburban developments within the greater areas of the American Deserts including the Sonoran, Mohave and Chihuahuan. This area of development spans from the Antelope Valley, at the tip of the Mohave in Southern California, to El Paso, within the Chihuahuan, and describe areas of cheap housing and rapid suburbanization as of the past 30 years.

This thesis seeks to investigate a particular condition: the proliferation of the single-family suburban house within the American Desert context in conjunction with aesthetics of the American dream, desire, and leisure, focusing on the area of southern California within the Antelope Valley region at the edges of both the Los Angeles Metro Area and the Mohave Desert, as the region is rich in the history of the single-family house, experimental housing, and, importantly is now facing an extreme drought condition, for the fifth year, in addition to an already arid desert climate.
Dust Bowl Drought

The Valley Annexed to LA

Owens Valley Conflicts

Dust Bowl Migration

Oil Fields in CA

1908 - 1913

Water is diverted from the Owens River Valley to LA

1910

Advertisement for ready-cut house

from Building Suburbia

Fountain 1917; Marcel Duchamp

Owens Lake is completely dry

Owens River Valley farmers attempt to destroy LA aqueduct
California's Central Valley is transformed into the "fruit and nut" basket of the world.

California Drought Test History of Endless Growth; New York Times 2015
The four American deserts: the Mohave, the Sonoran, the Chihuahuan and the Great Basin are found clustered within the Southwestern Region of the United States. Much of this land was acquired through the Treaty of Guadalupe Hidalgo of 1848 and continued to fuel ambitions of Western Expansion first experienced through the Louisiana Purchase that was a key pressure in settling the land west of the Mississippi. From 1803 onwards, through these two subsequent acquisitions of unsettled land, many steps were taken to entice new settlers into the region.¹

Early on this place was referred to by the term, ‘frontier.’ The first to see it faced an awesome and vast terrain. ‘Terrain’ would be a more accurate descriptor of the situation here, and it was an awe-some terrain. This terrain was unprecedented to the European eye and body. The place was filled with sublime wonders; these were later termed Death Valley, The Grand Canyon, and the Mohave Desert. Yet, the European mind quickly set out to dominate this nature. First the land was mapped and then the concerns became those of taming and reshaping this wild, rugged, and unforgiving terrain. To
create a productive landscape the colonists began a subverting of the American West. The homestead act, giving 320 acres of untamed land to a plethora of Americans enabled the lawn and crop growing as a signal of man’s strength over nature. Lawns became aesthetic extensions of Manifest Destiny, symbols of American entitlement and triumph, of the soft and verdant rewards that result when man’s ongoing battles against nature are finally won.²

1 Russell O. Wright, Chronology of Housing in the United States.
2 Elizabeth Kolbert, “The Life and Death of the American Lawn.”
Land As Colonists First Saw It, Antelope Valley
As shown during the American plight through the dust bowl, rain truly did not “follow the plow” as had been the slogan attracting many farmers to the plains. Domesticating the rugged terrain did nothing to, in actuality, tame the land instead the land reacted, revolted and marked its character even more strongly. As the dust bowl took the hope of many dwellers in the plains states many now farm-less and desperate farmers made their way towards the next “dream,” the California dream, the new fruit-and-bread-basket of the world. Again the race for taming the land began. This time the story was different, as California was the home of the biggest dreamers, the taming and greening of Los Angeles took full birth and the water-less was turned into an oasis, this time with the help of magnificent infrastructural feats from the Hoover Dam to the LA Aqueduct. Soon enough LA tamed the desert out of existence on sight. LA never saw itself as a city in the desert, a city that might live by its means and locale, but rather as an oasis, an illusion- the land of pool parties and palm trees.

The desert is not a tabula rasa. It is not a place of nothing, though it had been read and understood as such for those building upon it. First the land was made productive by turning it to agriculture, and eventually as cities and demand for housing and cities grew the agricultural land, which had already been denatured, or removed of its desert character, became developed as housing or commercial properties.
Signal Hill oil field, Long Beach, California, in 1937;
Image: Library of Congress
Los Angeles was founded on troubled terrain; No city should be there. The terrain was swamp, floodplain, desert, and: waterless.¹ In California, nature has been supplanted, rearranged almost at will to make possible an inhabitable place- a place now inhabited by 36 million, "which natural conditions alone could never have supported. "Not since Rome or the creation of Holland had any society even comparably subdued, appropriated and rearranged its water resources to achieve a mass society, nearly overnight- at once agricultural, industrialized, and suburbanized.² Los Angeles exists solely by the grace of infrastructure, a life-support system that has altered this wasteland into a second nature: a new version of wild and untamable terrain that has undone our attempts to control it, to subvert it into a paradise for "desert-dwellers-in-disguise" via a technological sublime.

Edward Doheny, in 1892, unknowingly tapped into the riches that revolutionized the fate of the then small town of Los Angeles whilst drilling for oil in his backyard.³ This yard would transform into the Los Angeles Oil Field and eventually transformed the terrain into the most productive oil region in the world over the sub-
sequent 70 years. This chance event catalyzed one of the largest oil booms in the country’s history. The city’s most rapid period of growth, decentralization, and automobile acquisition took place in the first decade after World War I. Between 1914 and 1930, oil and its industries were third only to housing construction and agriculture within the area describing and incredible increase in population coupled with a need for water.

The rate of automobile ownership went from 1/8 (1915) to 1/2 (1924) residents. The national average was 1 in 6 by 1924. Historians have argued that these changes were spurred on by rich oil production within the region. Gasoline prices here were less than half the national average, additionally oil was easily converted to asphalt. Los Angeles paved itself well before road paving was even trend in most American cities.

By 1940, LA was the most decentralized large city. More than half of Angeleans lived in single-family dwellings. Until 1970, the city was producing enough oil to meet all of its needs. At this rate, Los Angeles, by definition, could be considered the most ‘Natural’ city on Earth.

Today the fields meet a mere 14% of the Angelean’s regional oil demand, for water supply the number is much lower.

1 Kazys Varnelis, The Infrastructural City, 9.
2 Kevin Starr, California: A History, xii.
3 Kazys Varnelis, The Infrastructural City, 54.
4 Kazys Varnelis, The Infrastructural City, 54.
While initially water was a scarce resource in various regions of the Southwest, where populations began to thrive based on industries of mining, oil, and gold speculation. In order for any valid form of development of settlement to emerge and, furthermore, prosper, water was to be brought in. Once the water infrastructure was in place the construction industry as well as the agricultural industry became increasingly prosperous based on the cheap and vast availability of land. Various water technologies such as the LA Aqueduct, the Hoover Dam and the Central Arizona Project in combination with ideals of Manifest Destiny and the taming of the frontier steered Westward movement and a desire to prosper. All of the ingredients are there minerals, oil, cheap land, but most importantly a desire for water where there is none.

As Los Angeles grew and had exhausted the Los Angeles River the city sought new water. They water was found in the Owens River Valley further than 300 miles north. The valley was between the Death Valley basin and the Sierra Nevadas and was a rich agricultural region, first by the Paiute Indians and later by farmers and
ranchers on the bloodline of the Owens River, spurred by the reclamation act. There were over 200 miles of canals and ditches that constituted the irrigation systems in the Owens. In the 1900s, the then US Reclamation Service was planning on building an irrigation system to help farming in the Owens valley. Importantly, Los Angeles, if it planned to grow, needed to prevent this.

According to William Mulholland, the pioneer who dreamed of routing the Owens River Water over 200 miles South towards LA, the Owens River would do more good flowing from faucets than used on Owens Valley fields.1 Of course, the water would be diverted but, ironically, rather than only flowing through faucets the water would enter Los Angeles through the San Fernando Valley at the North. The San Fernando Valley was now destined for agricultural bliss. The aqueduct made the San Fernando Valley the new breadbasket of the world, a sort of desert paradise filled with apple orchards. Somehow irrigating Southern California, 300 miles away from any steady water supply was more suitable than irrigating the Owens River Valley. This event turned a landscape described as the “Switzerland of California” into an ex-

tension of its neighboring Mohave Desert. The Owens Lake became dry by 1924. By 1928, LA owned 90 percent of the water in the Owens Valley and agriculture in the region was effectively dead. This event came to be known as the California Water Wars. Eventually the irrigated, and hence denatured, fields of the San Fernando Valley were transformed into a suburban wonderland for LA.

Yet, with Los Angeles’s rapidly growing population and the city facing drought in the 1930s the LADWP began drilling hundreds of wells to tap the Owens valley groundwater. Until the 1970s these taps went by unaffected to the Owens valley compared to the river drainage that was going on. Yet, with the completion of the second aqueduct in 1970, Los Angeles increased its rate of pumping and quickly exhausted the groundwater supply; the level dropped, transforming many lush meadows, sparkling lakes, into a landscape of sagebrush, sand dunes, and the river into a small trickle. Today the plethora of agencies that move water South continues to be astounding.

"Actually so much water is moved around California by so many different agencies that maybe only the movers themselves know on any given day whose water is where, but to get a general picture it is necessary only to remember that Los Angeles moves some of it, San Francisco moves some of it, the Bureau of Reclamation moves some of it and the California state water project moves most of the rest of it, moves a vast amount of it, moves more water farther than has ever been moved anywhere."  

The Owens Valley is a contested landscape. Its residents objecting to the infrastructure imposed on one land to serve another, distant metropolis. As the Owens valley was drained and exhausted, the search for water was extended to Mono Lake. This lake eventually was defended against the treachery, but for the Owens it was too late. Owen’s Lake was left an ecological disaster. Wind gusts above 20mi/hr lifted over 20 tons of “Keeler fog” (soda fog) off the lakebed. This soda fog often reached over 2 miles in height, over 130 times the environmental limit for particulate matter over a distance of 250 miles from its origin. These storms occur two dozen or so times per year, usually during Spring and Fall. The microscopic particles contain significant toxic metals: selenium, arsenic, and lead, and efflores-
LA 02, from LANY, 2015;
Image: Jeffrey Milstein

Owens Dry Lakebed, Summer 2015
cent salts. The largest single source of PM10 pollution in the country, these storms were a great threat to 40,000 people in the area and brought risks of increased cancer rates, lung disease and eye problems. Reduction of dust blowing became the responsibility of LA who installed over 300 miles of pipe, up to 5ft in diameter and over 5000 irrigation bubblers to irrigate 30mi squared of toxic playa dust. Covering 30 square miles of playa the remedy cost the City of Los Angeles $425 million dollars to build and the equivalent of water supply for a city of 220,000 persons. The playa now appropriates at least $15 million a year in watering costs and $10 million a year in operating costs. 51,000 acre/ft of water, originally LA bound, are now pumped back into the Owens Lake each year, still this will never refill the lake, but just effectively subdue its attempted revolt in dust.

3 Joan Didion, "Holy Water", 222.
4 Kazys Varnelis, The Infrastructural City.
5 Kazys Varnelis, The Infrastructural City.
6 Kazys Varnelis, The Infrastructural City.
7 Kazys Varnelis, The Infrastructural City.
Lakewood Model Home, Lakewood CA; 
Image: City of Lakewood California
For California, life after the war would not be the same. The federal government had spent more than $35 billion in California, this had multiplied the manufacturing economy of the state by 2.5 times and had tripled the average personal income.\(^1\) Approx. 1.6 million Americans had moved to the wonderland and millions had passed through on military training or being shipped out the pacific. It had played an important role as training camp, and port. By 1962 CA was the most populous state in the nation.\(^2\) Between 1945 and 1960 the San Fernando Valley, acquired by LA as part of a larger vision of water infrastructure, in 1915 was transformed from agricultural land of ranches, farms and rural towns into a “near-continuous suburbia of tract housing, swimming pools, boulevards and shopping centers.”\(^3\) Between August 14, 1945 (V-J Day) and November 1946 the San Fernando Valley subdivided upwards of 10,500 housing lots.\(^4\) In partnership, industrialist Henry J Kaiser and Developer Fritz Burns turned to the mass production of housing on the 411 acre Pomona Ranch. The Kaiser community homes sold for $4,000-5,000 each with so little as $150 down, due to the help of various loan pro-
grams; and with such ease an entire faction of new Californians, rather new Angelean Suburbanites was born. Between 1950 and 1953 Lakewood suburb in southeast LA County, gained 57,000 residents with the sale of 17,500 single family mass-produced homes.

The development of the American Suburb, the single-family dwelling unit soon became the image of the “American Dream.” Following the housing boom of the late 1940s the American suburban dwelling became the viral carrier of lifestyle imagery and is itself a representation of the American Dream. This ‘American Dream’ is imported into the Desert West at the onset of the 1950s after the explosive post WWII housing boom and is relentlessly, whilst generically, transposed across the entirety of the American Southwest landscape. The ‘matter of concern,’ here is that we are, and have been living in the American Desert for thousands of years, be it in a shifted modality post the WWII housing boom of the late 1940s. The cities here continue to grow and the American Desert houses over 20 million Americans. 20 Million Americans who often seek the oasis-desert city with dreams of 300 days of sunshine a year and greening its rugged barrenness. In domest-icating the desert, welcoming an influx in population, we have altered and marked its landscape in strenuous
The Essence of a House in Levittown, c. 1946;
Life Magazine April 1947

An Levittown Family, Standing In Front Of Their New Home, October 01, 1957;
Image: Joseph Scherschel
and forceful ways. The question hence becomes, 'how can we inhabit the desert?' How can over 20 million suburban dwellers continue to inhabit the North-American Deserts while subsisting an impending drought? Today People continue to occupy, and grow these cities whilst exploiting, erasing, and subverting the vast and beautiful desert landscape in between them.

1 Kevin Starr, California: A History, 237.
3 Kevin Starr, California: A History, 238.
4 Kevin Starr, California: A History, 238.
5 Kevin Starr, California: A History, 238.
6 Kevin Starr, California: A History, 238.

Waiting to Buy a Lakewood Home, 1951; Image: City of Lakewood California
The Circle, General Telephone Company magazine, November 1954; Image: City of Lakewood California

Move-in day in a newly opened suburban community in Lakewood, California, 1953

Lakewood Park Floor Plans, 1950; Image: City of Lakewood California

An Advertisement for Lakewood Homes, 1941; Image: City of Lakewood California
View of Lakewood in the 1940s; Image: City of Lakewood California

Built Fast, but Built Well, 1951; Image: City of Lakewood California
Poolside Gossip, Kaufman Desert House by Richard Neutra, Palm Springs, California, 1970; Image: Slim Aarons

Richard Gere Poolside, California, 1982; Image: Herb Ritts
lifestyle.

Pools, Lawns, Plumbing, and Cul-de-Sacs.

[n] life-style |ˈlif-ˌstī(-ə)l, -ˌstī(-ə)l|

[1] denoting interests, opinions, behaviors, and behavioral orientations of an individual, group or culture.

[2] denoting advertising or products designed to appeal to a consumer by association with a desirable lifestyle.

[3] Location is important even within an urban scope. The nature of the neighborhood in which a person resides affects the set of lifestyles available to that person due to differences between various neighborhoods’ degrees of affluence and proximity to natural and cultural environments.

[n] life-style support |ˈlif-ˈstī(ə)l, -ˌstī(ə)l| /səˈpôrt/

[1] maintaining interests, opinions, behaviors, and behavioral orientations of an individual, group or culture at all costs.

[2] often denoting extensive technological and fantastical feats in attempt to avert a self-created crisis.

[3] the creation of dams, canals, pipelines, highways, economic systems, and vast infrastructures in attempt to control a rugged and unwilling environment, not suited to our desires as they exist.
1970s Block Party from Suburbia, 1972;
Image: Bill Owens
Antelope Valley Land before Development, October 2015;
Image: Liz Gálvez

Antelope Valley Land After Development, October 2015,
KB Homes Anaverde Community, Palmdale, CA;
Image: Liz Gálvez
The Antelope Valley, sits at the Western Tip of the Mohave Desert just an hour’s drive from the City of Los Angeles. It houses two major cities, Lancaster and Palmdale, within Los Angeles County and sustained explosive growth beginning in the 1980s serving as a bedroom community to the Los Angeles Metro. The Antelope Valley’s first main industry was agriculture, historically known for expansive alfalfa fields and fruit crops, farmers now grow a wider variety of crops, further West and East due to developed housing tracts that now occupy much of the center. Population growth has proved an issue in water supply and the area, historically serving as a building division during the construction of the Los Angeles Aqueduct is now reliant on the larger California Aqueduct. Today, The Valley alone houses over half a million people.

In its early history, the 1890s brought few farming families to the areas, yet most were unfamiliar to the desert climate and soon abandoned their settlements. Water was scarce until 1913 when the Los Angeles Aqueduct brought water into LA County. It was then that crops of apples, pears and alfalfa became plentiful. 1924 saw the building of the little rock dam and Harold Reservoir, now Lake Palmdale to
assist the agricultural industry, which would remain the leading industry in the area until World War II. The 1980s and 90s became the true defining era for the 2 cities in the Antelope valley as affordable tract housing began a dramatic spike in population. During the 80s Palmdale was the fastest Growing City in California, and the 2nd fastest growing city in the country. The population rose from a mere 12,227 in 1980 to 116,670 in 2000, experiencing a dramatic 460% increase during the 1990s.\textsuperscript{1} The Antelope Valley now houses both the busiest intersection within the California High Desert and the largest retail and commercial center within the Mohave. While foreclosures affected the area, Palmdale yet remains the fastest growing large city in California.

\textsuperscript{1} Census of Population and Housing, http://www.census.gov/prod/www/decennial.html.
Pine Trees in the Mohave Desert, October 2015, KB Homes Anaverde Community, Palmdale, CA; Image: Liz Gálvez

View From Model Home, October 2015, KB Homes Anaverde Community, Palmdale, CA; Image: Liz Gálvez
pacific communities model homes; Lancaster, CA.

Brochure Materials;
KB Home model homes; Palmdale, CA; Brochure Materials
Image: KB Home
Gov. Jerry Brown on Wednesday imposed mandatory water restrictions for the first time on residents, businesses and farms, ordering cities and towns in the drought-ravaged state to reduce usage by 25%.

"We're in a new era," Brown said. "The idea of your nice little green grass getting lots of water every day, that's going to be a thing of the past."

Source: CNN, Thursday April 2, 2015

The Mohave, Sonoran, and Chihuahuan Deserts, encompass regions of Southern California, Arizona, Utah, New Mexico and an area of 490,000 square miles. Over 20 million inhabitants dwell within this region. The Mohave Desert receives a mere average 5 inches of rainfall a year, the Sonoran the 'wettest' desert, averages between 3 - 16 inches of rainfall per year, the Chihuahuan desert receives about 9 inches of rainfall a year.

"Meteorologists define drought rather vaguely as an abnormally long period of insufficient rainfall that adversely affects growing or living conditions. Such a bland definition belies the devastation wrought by these unique natural disasters. In human history, whole civilizations, even while at their peak, have toppled in the face of prolonged drought. For humans, drought means failed crops, desiccates landscapes, water rationing, decimated livestock, and, in severe cases, water wars, famine and mass migration […] In drought prone regions, native plants and animals usually employ adaptations to survive through periods of lower than average precipitation. […] Humans in the West today, in contrast, have flourished only by manipulating the natural hydrology using modern engineering and technology." 1

The situation is becoming so desperate that increasingly far-fetched schemes for getting more water were devised. Amongst them importing water by pipeline or rail from Alaska’s Yukon River, or towing icebergs from
Antarctica. Even cloud seeding has been attempted in Northern California.

Both the driest region and home to the most rapidly increasing populations, the majority of the Southwest has been able to thrive on the voraciousness of the Colorado River. The Colorado remains a site for some of the country’s most ambitious 20th Century infrastructure interventions including dams, aqueducts, water banks, and canals. The river no longer reaches the Gulf of California and has literally been ‘dammed’ out of existence. This region, once again, is the site of intense debate on how to address an increasingly fragile ecology, and a complex economy of agriculture and tourism that relies upon the availability of water.

Generally speaking, it is difficult to get seriously concerned about what might happen until it does happen, hence making the politics of climate change so difficult and the realities of everyday life, such as affordable homes or raising a family are much more present to us. People often live in flood plains, earthquake zones and similarly on arid land. Considering the implications of peak oil, peak water and more severe climates may finally bring such a demise of the suburb, as we know, likely in the near future as these factors become more apparent, less abstract and felt in our everyday lives. 

The bursting of the real estate bubble revealed an opportunity for cities and suburbs to redirect their efforts towards not only additional energy resilience but also water resilience. Yet, by 2050 the census expects the US to add 100 million people, approximately the same number as from 1970-2010. These residents will have to take new homes somewhere, and if the “values of the recent past” remain they will settle in warm weather meccas, a large portion shunning the humidity will opt for the clear skies of the western Sunbelt cities.

These future Southwesterners will want to enjoy a semblance of the American dream that previous generations both pursued, and to varying degree have attained. Yet, this American Dream can no longer be sustained, the west desperately needs an updated Western American Dream, one that leaves little room for growing lawns.
Dry Owens’ Lakebed, Summer 2015;
Image: Liz Gálvez
Iceberg Towing

96 million black shade balls released into the Los Angeles Reservoir to reduce evaporation, August 2015;
Image: Gene Blevins/LA Daily News
“Mr. Brown [California Governor], in an executive order, directed the State Water Resources Control Board to impose a 25 percent reduction on the state’s 400 local water supply agencies, which serve 90 percent of California residents, over the coming year. The agencies will be responsible for coming up with restrictions to cut back on water use and for monitoring compliance. State officials said the order would impose varying degrees of cutbacks on water use across the board — affecting homeowners, farms and other businesses, as well as the maintenance of cemeteries and golf courses.”

A crisis is a turning point, a decisive moment when tensions and instabilities peak. Change becomes inescapable. Crisis implies the questioning of beliefs and habits. As crisis and scaremongering foretell injuries of an impending drought, political leaders call for an increase in permanent and drastic infrastructural feats, including the desalination of seawater and the importation of icebergs from Alaska, instead of re-examining the persisting ‘way of life’ at the core of the issue. As it is understood today, the lifestyle persists while the resources, and all else, succumb to this “desire.” The relentless proliferation of an un-revised suburbia is no longer possible and with the implication of this new water conscious culture and new legislation, what had previously seemed an abstract problem is quickly becoming reality and affecting our daily lives. This calls for the opportune re-invention of suburban living in the American Desert based on two important metrics: [1] an embrace of arid living via a reduction in the water consumptive lifestyle due to a lack of water availability and [2] the logic and success of the mass produced single-family home.

1 B. Lynn Ingram, The West Without Water, 24. 
2 William de Buys, A Great Aridness: Climate Change and the Future of the American Southwest, 174. 
3 William de Buys, A Great Aridness, 175. 
4 William de Buys, A Great Aridness, 175. 
5 William de Buys, A Great Aridness, 175. 
6 William de Buys, A Great Aridness, 175. 
7 Joan Didion, “Holy Water”, 222. 
California Drought Tests History of Endless Growth

A striking image depicting a region inundated by water, illustrating the impact of water scarcity on urban development. The photo captures a contrast between lush green landscapes and barren, dry areas, emphasizing the challenges posed by drought conditions.

California Drought Tests History of Endless Growth,
New York Times April 5, 2015; Damon Winter
When aridity is the single most prominent feature of the climate, the apparent ease of the California life falls an illusion. The West begins where the average rainfall drops below 20 inches. The American Southwest, notably unique for its desert and arid climate, is the site of most unusual contradictions in modes of domesticity and habitation. The American Southwest is both: home to the most rapidly increasing metropolises, such as Las Vegas and Phoenix, while remaining the driest region in the country. It is the land of “anything you want, any way you can get it.” Much like the idea of the lawn was transposed from “its British antecedents,” to the development of the American Suburb, the single-family dwelling unit soon became the image of the “American Dream.” Following the housing boom of the late 1940s the American suburban dwelling became the viral carrier of lifestyle imagery and is itself a representation of the ‘American Dream.’ This ‘American Dream’ is imported into the Desert West at the onset of the 1950s after the explosive post WWII housing boom and is relentlessly, whilst generically, transposed across the entirety of the American Southwest landscape.

We see the world as happening for the sake of humans and not in spite of humans (perhaps Latour’s conception of the dingpolitik). Water and the desert landscapes are seen in the instrumental worth that they provide to the human viewer, or user. These resources, specifically water and land, are not that important if we can find alternate ways of life the task lies in defining a way of life that does not require these types of resources and questions the persistence of the ‘American dream’ in an outdated both locale and mode.

1 Joan Didion, “Holy Water”, 222.
2 Marc Reiser, Cadillac Desert, 15-52.
3 Elizabeth Kolbert, “The Life and Death of the American Lawn.”
Antelope Green
Antelope Valley, California October 2015
Antelope Green
Antelope Valley, California October 2015
California drought progression.
the antelope valley.
DOMESTIC 14%
AGRICULTURAL 53%
ENVIRONMENTAL 33%

drinking 1 gal.
bathroom 119 gal.
laundry 25 gal.
kitchen 28 gal.
leaks 4 gal.
garden 20 gal.
lawn 100 gal.

INTERIOR

EXTERIOR

pool 1,000 gal.

current water consumption.
Suburban Edge, Antelope Valley, California:
Image: Google Earth
desert development.
suburban sample 01.

43330 WINDROSE LN.
LANCASTER CA, 93536-5544
<table>
<thead>
<tr>
<th>CITY</th>
<th>Lancaster, CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desert</td>
<td>Mohave</td>
</tr>
<tr>
<td>County</td>
<td>Los Angeles</td>
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<tr>
<td>Home Value</td>
<td>$ 263,331</td>
</tr>
<tr>
<td>Year Built</td>
<td>1993</td>
</tr>
<tr>
<td>IDEOLOGY</td>
<td>Oasis</td>
</tr>
<tr>
<td>Pool Ownership</td>
<td>56%</td>
</tr>
<tr>
<td>Front Lawn</td>
<td>100%</td>
</tr>
<tr>
<td>Back Lawn</td>
<td>81%</td>
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<table>
<thead>
<tr>
<th>AREA</th>
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<tbody>
<tr>
<td>Home Size [sq.ft.]</td>
</tr>
<tr>
<td>Bedroom</td>
</tr>
<tr>
<td>Bathroom</td>
</tr>
<tr>
<td>Garage</td>
</tr>
<tr>
<td>Lot Size [sq.ft.]</td>
</tr>
<tr>
<td>Pool [sq.ft.]</td>
</tr>
<tr>
<td>Lawn Area [sq.ft.]</td>
</tr>
</tbody>
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suburban sample 02.

4776 W AVENUE J6.
LANCASTER CA, 93536-2314
<table>
<thead>
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<td>Mohave</td>
</tr>
<tr>
<td>County</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Home Value</td>
<td>$316,891</td>
</tr>
<tr>
<td>Year Built</td>
<td>2005</td>
</tr>
<tr>
<td>IDEOLOGY</td>
<td>Oasis</td>
</tr>
<tr>
<td>Pool Ownership</td>
<td>20%</td>
</tr>
<tr>
<td>Front Lawn</td>
<td>75%</td>
</tr>
<tr>
<td>Back Lawn</td>
<td>75%</td>
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<table>
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</thead>
<tbody>
<tr>
<td>Home Size [sq.ft.]</td>
<td>3,391</td>
</tr>
<tr>
<td>Bedroom</td>
<td>3</td>
</tr>
<tr>
<td>Bathroom</td>
<td>3</td>
</tr>
<tr>
<td>Garage</td>
<td>2</td>
</tr>
<tr>
<td>Lot Size [sq.ft.]</td>
<td>8,009</td>
</tr>
<tr>
<td>Pool [sq.ft.]</td>
<td>0</td>
</tr>
<tr>
<td>Lawn Area [sq.ft.]</td>
<td>2,604</td>
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</tbody>
</table>
suburban sample 03.

41627 PALERMO CT.
LANCASTER CA, 93536-2969
<table>
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<th>CITY</th>
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</thead>
<tbody>
<tr>
<td>Desert</td>
<td>Mohave</td>
</tr>
<tr>
<td>County</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Home Value</td>
<td>$ 507,170</td>
</tr>
<tr>
<td>Year Built</td>
<td>2004</td>
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<tr>
<td>IDEOLOGY</td>
<td>Oasis</td>
</tr>
<tr>
<td>Pool Ownership</td>
<td>60%</td>
</tr>
<tr>
<td>Front Lawn</td>
<td>100%</td>
</tr>
<tr>
<td>Back Lawn</td>
<td>70%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Size [sq.ft.]</td>
</tr>
<tr>
<td>Bedroom</td>
</tr>
<tr>
<td>Bathroom</td>
</tr>
<tr>
<td>Garage</td>
</tr>
</tbody>
</table>

| Lot Size [sq.ft.] | 15,518  |
| Pool [sq.ft.]     | 503     |
| Lawn Area [sq.ft.] | 8,548   |
suburban sample 04.

2800 W. PONDERA ST.
LANCASTER CA, 93536-6472
<table>
<thead>
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<th>CITY</th>
<th>Lancaster, CA</th>
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</thead>
<tbody>
<tr>
<td>Desert</td>
<td>Mohave</td>
</tr>
<tr>
<td>County</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Home Value</td>
<td>$ 291,976</td>
</tr>
<tr>
<td>Year Built</td>
<td>1994</td>
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</table>

<table>
<thead>
<tr>
<th>IDEOLOGY</th>
<th>Oasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool Ownership</td>
<td>42%</td>
</tr>
</tbody>
</table>

| Front Lawn | 100% |
| Back Lawn  | 80%  |

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Home Size</td>
<td>[sq.ft.] 2,378</td>
</tr>
<tr>
<td>Bedroom</td>
<td>3</td>
</tr>
<tr>
<td>Bathroom</td>
<td>3</td>
</tr>
<tr>
<td>Garage</td>
<td>3</td>
</tr>
</tbody>
</table>

| Lot Size   | [sq.ft.] 7,265   |
| Pool       | [sq.ft.] 337     |
| Lawn Area  | [sq.ft.] 1,302   |
suburban sample 05.

2121 SHELLBARK CT.
PALMDALE CA, 93551-6958
<table>
<thead>
<tr>
<th>CITY</th>
<th>Lancaster, CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desert</td>
<td>Mohave</td>
</tr>
<tr>
<td>County</td>
<td>Los Angeles</td>
</tr>
<tr>
<td>Home Value</td>
<td>$375,444</td>
</tr>
<tr>
<td>Year Built</td>
<td>2005</td>
</tr>
<tr>
<td>IDEOLOGY</td>
<td>Oasis</td>
</tr>
<tr>
<td>Pool Ownership</td>
<td>30%</td>
</tr>
<tr>
<td>Front Lawn</td>
<td>100%</td>
</tr>
<tr>
<td>Back Lawn</td>
<td>50%</td>
</tr>
<tr>
<td>AREA</td>
<td></td>
</tr>
<tr>
<td>Home Size [sq.ft.]</td>
<td>3,754</td>
</tr>
<tr>
<td>Bedroom</td>
<td>5</td>
</tr>
<tr>
<td>Bathroom</td>
<td>4</td>
</tr>
<tr>
<td>Garage</td>
<td>2</td>
</tr>
<tr>
<td>Lot Size [sq.ft.]</td>
<td>8,268</td>
</tr>
<tr>
<td>Pool [sq.ft.]</td>
<td>358</td>
</tr>
<tr>
<td>Lawn Area [sq.ft.]</td>
<td>2,006</td>
</tr>
</tbody>
</table>
cul-de-sac sample 01.
40-acres and a cul-de-sac.

The comfort zone for a developer is to begin with a 40 acre site and extend development from there. On a given 40 Acre plot a developer may build about 156 houses, but through this configuration of density, the desert becomes obsolete.
design methodology.

Suburban Element Analysis

The design methodology for the project begins with the breakdown of the elements of suburbia and a further questioning of those elements that relate specifically to water within the desert context, be it the kitchen sink of the front lawn.
KB Home Haciendas
Residence Option 03
3650 sq. ft.
5 Bed, 3 Bath 2 car Garage
$413,990
$3,168 mo. for 30yrs.
Palmdale, CA
The design methodology for the thesis develops from a direct questioning of the elements of the suburban house. As questioning or defining suburbia itself as “good” or “bad” becomes unproductive, the project seeks to question the specific elements of the suburban home that deal directly with water and are relevant within this particular context of water scarcity. The following pages look specifically at the constructed logic of the pitched roof, lawn, the “bath”room, kitchen, and swimming pool, bathroom in order to distill how these elements became en-grained within the suburban logic, be it through cultural, marketing, or practical means.

**elements for analysis.**
the pitched roof
The pitch slope determines the rate and efficiency at which the roof may re-direct water from its surface.

pitch slope.
house roof profiles.
"flat"  gable  hip

lean-to  cross gable  cross hip

butterfly  catslide  dormer

cross elevation profiles.
longitudinal elevation profiles.
planimetric slope direction.
*individual roof profile.*

Roof profiles of single-family American home styles.
collective roof profile.

Roof profiles signifying collective living.
collective roof profile.

Roof profiles signifying collective living.
repeated individual roof profile.

Roof profiles signifying adjacent living for individuals. In North-America, traditionally, a townhouse predates the automobile and denotes a house on a small footprint in a city, but because of its multiple floors (sometimes six or more), allows for large living spaces. Townhouses are expensive where detached single-family houses are uncommon. In this model there is often a continuous roof and foundation while a "party" wall divides adjacent homes. The name townhouse or town home was later used to describe non-uniform units in suburban areas that are designed to mimic detached or semi-detached homes. Ironically, today, the term, townhouse, is used to describe units mimicking a detached home that are attached in a multi-unit complex.
the front lawn
daily water usage.

The state of California alone, uses 9 billion gallons of water daily on lawn upkeep, according to the EPA.
corn vs lawn.

The green carpet, or turf, covers about 49,421 square miles of American land. This is three times more acreage than irrigated corn, a productive crop, covers in the nation.
english estate.

The grand lawns and gardens of the English estate became a symbol of status, prestige and wealth as landowners could afford to grow an aesthetic garden over an agricultural one. The estates also involved significant maintenance of the lawn that involved various servants and pasture animals. This was a symbol of culture. Lawns are often about self-image; the identity with a manicured lawn suggests higher status.
The “green carpet,” borrowed from French gardens and English estates remained a concept in which the colonies desired to match Europe, as a signal of status and elitism in America. signs, too, that their owners, in the days before lawnmowers lessened the burden of grass-shearing, could afford to pay scythe-wielding servants to do that labor.
manifest destiny, or “man vs. nature.”

The homestead act, giving 320 acres of untamed land to a plethora of Americans enabled the lawn and crop growing as a signal of man’s strength over nature. Lawns became aesthetic extensions of Manifest Destiny, symbols of American entitlement and triumph, of the soft and verdant rewards that result when man’s ongoing battles against nature are finally won."
The lawn, carrying English connotations with it, became a symbol of prestige in the suburbs. From Levittown on, the lawn was a surface that connected the houses, both morally and aesthetically.\textsuperscript{1}
The lawn, carrying English connotations with it, became a symbol of prestige in the suburbs. From Levittown on, the lawn was a surface that connected the houses, both morally and aesthetically.

the lawn is our civic duty.
The seeds for most turf grasses that provide a “green carpet” to surface the U.S. are generally not native. While grasses can certainly survive here they are unlikely to thrive on their own, but rather require much care, and rainfall, be it through an artificial garden hose. Bunch grass on the other hand is native to the Southwest and requires little water and maintenance, though it does not provide an even turf.
the “bath”room
“what” room?.. 

The elements as we find them in the “bath”room today have not always been so. In actuality the developer room containing a bath/shower, toilet and sink within vicinity of one another is only visible as a historical blimp, and in a small piece of the world.
holy sinks.
post WWII “bath”room.
house plans with “bath” rooms.
the toilet
the washbasin
the bath
the swimming pool
The first swimming pool was a bath.

The Great Bath of Mohenjo-Daro, built in 3 Millennium BC.
olympic pool.

The Modern Olympic Games began in 1898 and included swimming races, after which the popularity of swimming pools began to spread. The oldest known public swimming pool in America, Underwood Pool, is located in Belmont, Massachusetts.
Home swimming pools became popular in the United States after World War II and the publicity given to swimming sports by Hollywood films such as Esther Williams’ Million Dollar Mermaid made a home pool a desirable status symbol. More than 50 years later, the home or residential swimming pool is a common sight. Privately owned outdoor pools in backyards or gardens started to proliferate in the 1950s in regions with warm summer climates. Before 1950, Americans went swimming as often as they went to the movies, but they did so in public pools. There were relatively few club pools, and private pools were markers of extraordinary wealth. Over the next half-century, though, the number of private in-ground pools increased from roughly 2,500 to more than four million. The declining cost of pool construction, improved technology, and suburbanization all played important roles. Scene to meet the growing demand for what many considered the ultimate at-home luxury, the backyard swimming pool.
"iconography tests."

The Icon of the House

The following iconography tests seek to develop the icon of the pitched roof, of the home as a spatial element through means of carving aggregation and extrusion. The tests seek to utilize the iconic and recognizable form to create a transformed production of the home, while retaining its symbolism. The tests also seek to question the aggregation of the single-family home as we know it to inspire collectivity. Water savings and a new social life around water become the drivers for this new desert collectivity as well as the creation of a new desirable "suburban product".
block type with the house icon carvings at mid-level

rectangular piercings allow for light and water collection
block type with the house icon carvings at an angle

block type with the house icon extrusion
block type with orthogonal house icon carvings at ground level
*courtyard type with house icon extrusions*

*courtyard type with house icon carvings at facade*
house massings support flat roof

house carvings are aligned longitudinally
house massings removed from block

house carvings are intersected to create vaulting
courtyard type with house icon carvings

courtyard type with house icon extrusions
house massings are aggregated orthogonally
block type with the house icon carvings at ground-level courtyard piercings allow for light and water collection

short elevations
long elevations
linear type with the house icon carvings rectangular piercings allow for light and water collection
the proposal.
Cul-de-Sac View From Above.
life under the desert sun
The icon of the house is spatialized as a void. These forms then provide for a collective entry porch on the ground level. The pitched roof collects water and directs it to a central location through a series of channels.
The facade plays with the language of the various common roof lines used in suburbia in their simplest forms.
Rainwater is collected to a central location through a system of gutters. The water is then channeled into a cistern and passes through the necessary water filtration mechanisms before being pumped up into the collective steam shower and the fountain in each unit. The used water returns to a gray water cistern on the ground floor to be reused in the collective bathhouse, shared amongst 16 units.
The Fountain, Single Source of Water Within Each Home

Shared Steam Shower, Can be Accessed from each of the Four Units
The project takes advantage of dry toilets and pushes the idea of the outhouse. The urine diverting dry toilets are housed on the ground level and are detached from the dwelling units. Through this gesture, the outhouses become part of the public realm and the community is able to remove and reuse the defecated matter collectively through a series of ramps on the ground level.
**revised water metrics.**

The major transformation within the new dwelling unit comes through the invention of the fountain. The fountain, is the single source of water for each dwelling unit and is composed of a single faucet surrounded by various basins, devised by function. The dry toilets use no water and a reliant on urine diversion and composting of the defecated matter.
The fountain.

The fountain is shared between the bodily functions, such as face and hand washing, shaving, and the kitchen functions such as food preparation and dish-washing. The fountain is the single source of water for the dwelling unit. The invention of the fountain stems from a desire to instill a new relationship to water within the home. Here water is venerated while bringing the family together. Importantly, the water must be flushed away, thereby bringing an increased awareness of gray-water and the amount of water consumed through different functions.
reduced water usage.

The fountain and steam shower use a mere 22 gallons of water per day.
The dust storm creates the illusion of a transformed fence by using the natural east-west directional winds in the area. This begins the organizational strategy for the site as a whole.
front and side elevations.
floor plans.
transformed cul-de-sac
a transformed and endless desert suburbia
site model images.
General


American Desert / The Southwest


Water (Scarcity) in the West


Suburbia and American Housing


**The Lawn**


**Swimming Pools**


**Plumbing, Bathrooms and or Kitchens**

