

Dedicated to the increase and diffusion of knowledge about how the nation's lands are apportioned, utilized, and perceived.

The Lay of the Land

The Center for Land Use Interpretation



"We shall not cease from exploration, and the end of all exploring will be to arrive where we started and know the place for the first time." - T. S. Eliot

TEXAS OIL LANDSCAPE OF AN INDUSTRY



Permian Basin Oilfield, from *Texas Oil: Landscape of an Industry*. CLUI photo

TEXAS, NEARLY A NATION UNTO ITSELF, is the cradle of oil, the industry that built modern America and that continues to spread across the globe. It will be a while before the fuel of the fossils gives way. To help understand the form, scope, and scale of this transformative human activity, the CLUI produced the exhibit, *Texas Oil: Landscape of an Industry*, shown in Houston, and now on view at the CLUI in Los Angeles.

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FOCUS ON OIL

Like stone, bronze, and other fundamental materials that defined the ancient ages of human industry, oil defines these times. No other raw material has such a reach into our technologies and the products that we consume. How this came to be should be the story of our age, told and retold like myth. The places of oil production, conveyance, storage, and processing are the physical landmarks of the petroleum age. Understanding how this system works, on a national level, creates a picture of who we are as a people.

- The Center for Land Use Interpretation



150 years ago, Edwin L. Drake was in Pennsylvania, hammering a hole into the ground, hoping to find rock oil. He was using a steam powered cantilevered walking beam that lifted, then dropped, a steel bit, attached to the end of a rope, onto the rocky ground, over and over, slowly making a hole. Finally, on a Saturday in August, 1859, oil appeared in the 69-foot deep hole. The first successful commercial oil well had been completed.

If one considers this act as its origin, 2009 is the sesquicentennial of the oil industry. To acknowledge the importance of this industry to the creation of contemporary landscape and culture, the Center for Land Use Interpretation is presenting a number of regional exhibits about oil in the American land.

THE TRANS-ALASKA PIPELINE A PHOTOSCAPE EXHIBIT



The Trans-Alaska Pipeline. CLUI photo

THE TRANS-ALASKA PIPELINE WAS THE subject of an exhibit at the Center's Los Angeles gallery over the winter. Among the longest oil pipelines in the world, the Trans-Alaska Pipeline is unique in its isolation and construction. In the mid-1970s, 100,000 forty foot sections of half-inch thick steel pipe were welded together, wrapped in insulation and an outer covering of sheet metal, and stretched across our emptiest state, in one fell swoop. 30 million gallons of crude still flow through it daily.

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EXAMINING THE WASTE STREAM

A CLUI EXHIBIT ABOUT GARBAGE



Toyon Canyon Landfill, Griffith Park, Los Angeles.

CLUI photo

GARBAGE IS THE EFFLUENT OF OUR consumption, and it flows backwards through the landscape of Los Angeles. Unlike liquid wastes, which drain downslope to the sea, the tiny tributaries of trash, from millions of homesteads, collected by a fleet of thousands of trucks circulating in constant motion, hauling to nodes of sorting, distribution, reuse, and, finally disposal, flow up the canyons and crevices to the edge of the basin.

Los Angeles's garbage is typical, and extreme. The flood plain is bustling and filling to the brim, and the trash mounds are narrowing down. The waste stream is converging on Puente Hills, already the largest active landfill in the nation, where in the near future, trash will be boxed up into trains and sent two hundred miles to a gold mine in the desert. Away, in a sense, from one place to another. Garbage flowing backwards up and over the land.

Post Consumed: The Landscape of Waste in Los Angeles was an exhibit produced by the CLUI about the residential waste stream in the city of Los Angeles. Locating and describing how physical waste material moves around the city, the exhibit was composed of digital images, video, printed material, and material artifacts (including different types of waste). *Post Consumed* was on display in the Center's Los Angeles exhibit space from May to October 2008, and a version was included in the group exhibit *Into the Open: Positioning Practice*, which was shown at the U.S. Pavilion of the Venice Architecture Biennale, and later at Parsons the New School for Design.

A Brief History of Trash in Los Angeles

In the old days, before World War II, the waste system as we know it in Los Angeles didn't exist. People burned trash in their backyards, and organic waste such as food scraps was composted or picked up by hauling companies and taken to hog farmers. The City Bureau of Sanitation, formed in 1890, operated a solid waste crematory for dead animals and such, to prevent disease. During World War II, the city took over residential waste collection, and materials were heavily conserved or recycled for the war effort.

After the war, as consumerism spread, the waste stream grew. Backyard incineration was banned in 1957, to prevent fires and pollution. In the early years of the postwar garbage-era, materials were still generally sort-

ed by type and piled on the curb or in bins, sorted by type. As garbage volume increased, this became more complicated. In 1961, to gain favor with his constituency, Mayor Sam Yorty declared that all trash could go in one bin, and the city would haul it away to a landfill. And so, landfills grew.

The Bureau of Sanitation operated several landfills on the edges of the city, and in Griffith Park and Elysian Park, until the last landfill was declared full, in the mid-1990s. Private waste companies now dispose of the city's waste. Currently, nearly all of the city's trash goes to the Allied Waste Company's Sunshine Canyon landfill, next to Newhall Pass. Private companies also own and operate most of the sorting facilities for



The Black Bin

On trash day, trucks pick up the contents of the black bin. Once full, they either drive directly to a landfill, or to transfer facilities, where trash is consolidated into larger trucks, which take it to a landfill. This is how more than 2,500 tons per day of material finds its way immediately out of the lives of the citizens of the City of Los Angeles, and back to the land.

The Blue Bin

The blue bin appeared in Los Angeles in 1995, and it now handles about 15% of the total waste stream, in weight. The trucks picking up the blue bins unload at waste transfer stations or Material Recovery Facilities ("mirfs"), where the material is sorted, then moved to other places for further sorting, and to reprocessors and packers that specialize in specific materials. In the City of Los Angeles, items that can be put in this bin include glass bottles, aluminum cans, tin cans, aerosol cans, paint cans, metal hangers, plastic bottles and jugs, and all types of paper, so long as it is clean. Styrofoam was recently added to the list, though no packing peanuts are allowed. Of course whatever you put in this bin, compliant or not, has to be dealt with, at its next stop.

The Green Bin

Yard trimmings, composed mostly of leaves, prunings, and grass from the mowing of lawns, make up around 30% of the total waste stream in Los Angeles. The green bin can also be used for fruit and vegetable food scraps, and for clean wood. The material from these bins is collected at mulching facilities, operated by the city and private companies, where it is ground up and turned into mulch for use on city landscaping projects. The mulch is also made available for free to the public.

POST CONSUMED: THE LANDSCAPE OF WASTE IN LOS ANGELES

blue-bin recyclables. But the Bureau of Sanitation still picks up the trash, operating a fleet of six hundred trucks, which visit each of the 750,000 households in the city of Los Angeles once a week, three times, one for each bin.

Waste collection for 75 other municipalities and unincorporated areas of Los Angeles County, outside of the City of Los Angeles, which comprise another four million people and a million more households, are handled mostly by private carriers, such as the two mega-waste companies Allied Services and Waste Management Incorporated, and coordinated by an independent agency called the Sanitation Districts of Los Angeles County, generally referred to as the “Sanitation Districts” or “County San.”

Unlike the City of Los Angeles, which has no landfills but lots of trash trucks, County San has no trucks but takes care of the landfilling. Nearly all of the waste handled by County San heads to the largest active landfill in the United States, Puente Hills. And that is filling up, scheduled to close in five years. To replace it, and most other landfills in the region, County San is developing an intermodal transfer facility at the base of Puente Hills, where trash will be compacted and loaded on trains.

From there the waste will go to the Mesquite Landfill, which is being prepared now in the extreme southeast corner of the state, beyond the Salton Sea, 200 miles from Los Angeles. A second desert mega-fill for the region's waste, at Eagle Mountain, a former iron mine, is still being debated, as it is next to Joshua Tree Park.

What's in the trash?

Different types of paper and cardboard make up a third of the total disposed material, in weight, in the United States. Newspaper is among the largest category, with close to a million tons discarded in California every year.

By volume, the largest component of domestic waste is packaging. Corrugated cardboard is one of the most disposed of materials in the waste stream. Most cardboard is from packaging (cardboard boxes) used to ship products. Worth about 4 cents a pound, cardboard is also one of the most recycled materials. It is the largest export from the port of Los Angeles.

Around 62 billion bottles and cans are disposed of annually in the United States. Despite bottle bills in many states, only a third of them are recycled. Over 37 billion polyethylene plastic bottles are disposed of annually in the United States. Three quarters of them are landfilled or escape the waste stream altogether.

Because it is lightweight (98% air), expanded polystyrene packing foam is a small part of the stream in weight, but a large amount in volume. Because it is fragile, it breaks down easily and spreads throughout the waste material, appearing nearly everywhere. A few companies are recycling this ephemeral material, but due to its lightness and volume, transporting it separately by car or truck to recycling centers is hardly economical.

Food waste is another large component of the waste stream, making up 10-15% of the total disposed material. Most of this is from domestic waste bins. The aggregate of decomposing organic matter is the element that gives trash its particular odor.

Scrap wood makes up nearly 10% of the disposed waste in California. Construction and demolition materials, such as wood, concrete, and gypsum wall board, are typically landfilled separately from municipal waste, and often deposited in former gravel pits.



Sorting material by hand at a MRF.

CLUI photo

What's a MRF?

Material Recovery Facilities (MRFs or “mirfs”) are key components in the waste stream. They capture and sort the recoverable resources, generally called recyclables, which come to them from commercial sources, or from the blue recycling bins of the wastesheds of the region. There are around 50 MRFs in the county, most operated by private waste companies.

Waste materials at MRFs are sorted by hand. The handling of raw waste, and not just recyclables, is known as “dirty MRFing,” and is practiced by a few businesses and cities in the county. But even the recyclables that go to the MRFs are pretty unsorted and dirty.

In 1989, the state of California passed the Integrated Waste Management Act, drastically changing the waste industry in the state. This law, a response to excessive waste production and the filling of landfills, required that 25% of the state's trash be diverted from flowing into landfills by 1995, and 50% diverted by 2000.

Meeting these goals required the implementation of recycling programs, and ushered in the era of the blue and green bins. These diversion goals were met, and future rates are now being debated, stretching towards a horizon of zero waste.

Until zero waste becomes a reality, if it ever does, there will be landfills. And even then, there will be former landfills to manage, as closed landfills will continue to settle, leak, and vent gas for the foreseeable future. The landscape of waste in Los Angeles, and other cities around the globe, is with us for longer than we care to imagine, and longer than we can possibly try to forget. ♦

Turn to page 9 for an account of the CLUI “Trip to the Dump” bus tour to the Puente Hills Landfill.

Post Consumed: The Landscape of Waste in Los Angeles was part of the Center's ongoing series of programs about the waste stream, and was supported by a grant from the Department of Cultural Affairs, City of Los Angeles.

WENDOVER REPORT

FROM THE CLUI COMPLEX ON THE EDGE OF THE SALT FLATS

THE ANNUAL WORK PARTY BROUGHT THE usual group of unusual people to CLUI Wendover—people who enjoy heavy labor, in the heat of late July, in the Great Salt Lake Desert.

With the expansion of the Center's footprint at Wendover currently at equilibrium, herculean work was focused on maintenance and finishing touches, such as cleaning out the mountains of collected junk from over 10 years spent scavenging debris from the landscape for use in sculptures (much of it actually assembled by James Harbison, a particularly acquisitive sculptor who was in residence several years ago, and who, during his residency, spent a night in jail in Elko, after being caught behind the grocery store, with a milk crate . . . but that's another story).

After a number of years of periodic renovations, the Center's Orientation Building was finally opened to the public. This is a good first stop for visitors coming to CLUI Wendover, as here one can find maps, images, text, and displays that provide an overview of the area, from the macro to the micro.



Two viewers of Martin Hogue's exhibit.

CLUI photo

Two new exhibits are on display, created by participants in the Wendover Residence Program. Martin Hogue's project, *A Site Constructed: The Bonneville Salt Flats and the Land Speed Record, 1935-1970*, is featured in Exhibit Hall One. Lisa Blatt's installation *Night Light* is on view in Exhibit Hall Two. Other participants in the Residence Program will be displaying work in the future. The 2008 season group included Joni Sternbach, Neal White, Sarah Cowles, Steve Lacy, Erica Olsen, Owen Gump, Sonja Hinrichsen, and a group from Portland Oregon called *Nowhere*.

Several recidivists returned last season to continue with their long-term projects. Richard Saxton, of Municipal Workshop, brought his art class from Boulder Colorado to work at the site, and to do some maintenance on the *Auto Tour* quadricycle they constructed as part of their residence in 2005). Simparch went out for a few weeks to maintain and improve their *Clean Livin'* off the grid outpost at South Base.

Lucy Raven, whose motion picture project was initiated during her residency in 2007, returned to complete it. Called *China Town*, the hour-long film, composed of high resolution still images and sound, follows the journey of copper ore from a mine in Ruth, Nevada, 130 miles south of Wendover, to a smelter in China. It has been shown at a number of venues

in New York, Los Angeles, and San Francisco, including a screening at the Bureau of Land Management in Ely, Nevada.

The first project within the Interpretive Research Facility initiative at Wendover was executed by a group of students in the Curatorial Practice Program at the California College of the Arts (CCA). Called *Base/Basin*, the project was developed over the course of a semester as part of a class led by Marina McDougall, and Matthew Coolidge of the CLUI. Each student explored a different aspect of the landscape and perceptual phenomenology around Wendover, and together the group devised a tour that others can take.

The students' tour begins at the base of the CLUI's observation tower, where instruction sheets guide people up the tower. There, audio playback devices and headphones are available, to be worn for the rest of the tour. After a number of audio programs point out literal and metaphoric observation points from the top of the tower, visitors are guided across the old WW II airbase to the swimming pool, now abandoned and dry. The audio program and tour concludes there, at one of the deepest points in the ground in the area—the bottom of the basin.



To begin the Base/Basin tour designed by students from CCA, visitors find their way to this sign, and dig with the shovel to unearth the tour instructions, which are located in a jar in a buried washbasin. CLUI photo

In the Spring of 2009, another group from the Curatorial Practice Program at the California College of the Arts assembled an archive of films about the region, creating a collection of cinematic interpretations of Wendover, the Bonneville Salt Flats, and the Great Salt Lake Desert. A presentation of selections from the archive was made during an evening at the Studio for Urban Projects, in San Francisco, in April, 2009. The archive will be made available to all participants in the Center's Wendover Residence Program. ♦



Curators bottoming out below grade in the pool at Wendover.

CLUI photo

HOUSTON REPORT

FROM THE CENTER'S GULF STATES FIELD OFFICE

The Center's Gulf States Logistics Site and Field Office in Houston has been busy over the last year, supporting a variety of programs in the region. Located on the Buffalo Bayou, on the industrial east side of Houston, the site provides workspace, storage, and access to the city's urban waterways. What follows is a sample of some projects, events, research, and incidents performed by the Gulf States office.



Nearly 100 cars showed up for the *Junkyard Drive-In*, with the lights of downtown Houston in the distance. CLUI photo

Oil Movie Night at the Junkyard Drive-In

On a Saturday night in late February 2009, the Center's Gulf States Logistics Site hosted a special event: *Oil Movie Night at the Junkyard Drive-In*. For this event, the site, a former junkyard still littered with decals, lug nuts, trunk lid lock covers, and other car fragments, became a drive-in movie theater for an evening of films selected by the CLUI, and presented by the Aurora Picture Show.

The 80-minute program included industrial and promotional films from the 1930s to the present day, describing the nature and evolution of the oil industry, and how it has been represented and perceived. Among the films included were *Frontiers of Friction*, a beautifully shot film describing the technology of lubrication, produced by Shell Oil in 1962; a lyrical, euro-techno-music video produced by the Dockwise Company, featuring their ship, *The Mighty Servant*, moving unbelievably large structures like semi-submersible oil rigs around the world; and the CLUI-produced *Hollywood Gusher: Ode to Joy*, a compilation of oil rig blowout scenes from major motion pictures, showing how the popular icon of the spewing oil drilling derrick combines potent sexual metaphor with industrial success.

The sea of car faces that comprised the audience honked their horns and flashed their lights expressing levels of approval between the various films. The vehicular applause soared to a cacophonous din when the last film, *Hollywood Gusher* climaxed, under the strains of Beethoven's *Ode To Joy*, and the credits for the evening rolled, acknowledging every oil-related company we could think of, for their part in making this all possible.

Urban Bayou Expeditions

Over the past year, the CLUI has conducted numerous expeditions on the Buffalo Bayou, some informal, others for paying guests. The tours have been focused on the upper bayou, the portion of the waterway between the Ship Channel and downtown Houston. This stretch of industrial wa-



A CLUI-led excursion on the Buffalo Bayou, passing under the rail lift bridge stuck under the freeway overpass. CLUI photo

terway is in transition, from industrial to post-industrial, and features scrap yards, sewage plants, abandoned railway bridges, condo lofts, prisons, and many other intriguing and revealing characteristics of the cityscape.

The CLUI also conducted a public grand tour of Houston's Ship Channel and petrochemical landscape, by bus and by boat, called *Downstream: A Tour of Houston's Water and Oil*. Read about it on page 13.



The climax of the grand spectacle event on the Buffalo Bayou. CLUI photo

Grand Spectacle Celebrates Petrochemicals and Sesquicentennialism

The CLUI staged an event on the waterways of Houston in late March, 2009, a public spectacle that made connections between the founding of Houston, its emergence as a global city, and the celebration of the sesquicentennial of the oil industry. This commemorative event commemorated commemoration, a spectacle celebrating celebration and spectacle.

The event was driven by a multimedia performance that re-examined a 1986 concert commemorating the sesquicentennial of the city's founding in 1836. The 1986 event, titled *Rendez-vous Houston*, centered around a synthesizer-oriented performance by French musician Jean Michel Jarre which was one of the largest concert spectacles ever produced at the time.



The CLUI respectacle raft positions itself in front of the audience, as dusk approaches.

In the Center's "respectacle" event in March, Jean Michel Jarre's performance was deconstructed by multimedia artist/musician Jesse Stiles, and staged on a floating plastic platform designed by the group Simparch. Titled *Déjà Rendez-vous*, the CLUI spectacle fused the founding of Houston and the Republic of Texas (1836), and the current sesquicentennial (1859 - 2009) of the oil industry, through the laser guided lens of Jarre's concert event.

Jarre was known for his global *son et lumière* spectacles, as well as his soaring synth music, found on successfully selling albums such as *Oxygen* (1976), and *Zoolook* (1984). His performances included use of the laser harp, musical laser beams that fan out over the audience and are plucked like the strings of a harp. He performed cascading glissandos on custom-made circular keyboards, lit from within, while lasers and lights danced in monumental amounts of wind driven smoke. His Houston performance took place outdoors, on a stage near the Buffalo Bayou, and engaged the skyscrapers of downtown as a backdrop. Texaco's headquarters was covered with a screen onto which images of Texas were projected. Several other corporate oil building's tops spewed fireworks, like crude gushing out of a wild well. Jarre's show was witnessed by over a million people, listening over speakers and on the radio. Many watched from freeway overpasses, which were closed to traffic for the event.

For the CLUI event, no freeways were closed. Though the city's downtown was also visible, it was distant, as the event took place on the other side of town, on the industrial end of the Bayou. The performance platform, created by the build/design team Simparch, was assembled over the weeks prior to the event. It was a fully self-contained eventspace, with a large screen for rear screen projection for an audience on shore. As the time for the performance approached, the platform was propelled up the Bayou by an outboard engine, and positioned in place, facing the audience that had amassed in Tony Marron Park. As darkness fell, the respectacle began.

Using a five-channel array of video projections, monitors, and loudspeakers, Jesse Stiles' performance kaleidoscopically dissected, re-assembled, and spatialized grains of footage from the 1986 event, investigating the augmentation and removal of original time, and creating new patterns of movement and rhythm by re-arranging those moments across the multiple channels of the performance space.

It operated in a sense like a reactor, converting the ecstatic synthetic gloss of Jean Michel's original show into a new, refined product of pure pixel notion and light. It distilled the essence of pure commemoration, fusing



The respectacle fused live fireworks, with those on the screen from the original *Rendez-vous Houston* event.
Photos by Deborah Stratman

the layers of 1836, 1986, and 2009, in the plasma of spectacle. Historical carbon catalytically cracked into an event that apogeed with a burst of fireworks, then dissipated, wafting away like smoke, remaining only as memory. ♦

Right: Simparch worked day and night on the respectacle platform in the shed at CLUI Houston. It will be converted into the *Tex Hex Water Unit*, a self-contained living video barge.



Left: The respectacle platform being prepared for the event at CLUI Houston's dock, and catching trash flowing down the bayou.



Above: Jesse Stiles prepared the video and audio for the event, in his perch atop the shed at CLUI Houston.

Left: The folding screen being attached to the platform.

The Déjà Rendez-Vous event marked the end of the CLUI's year of programming in Houston. The event was co-sponsored by the Mitchell Center for the Arts, and was held as part of the Systems and Sustainability symposium at the University of Houston. The other co-sponsor was the Buffalo Bayou Partnership, which commissioned the performance platform for this and future public events along the Bayou, as the first in a series of art and events called Confluence: Points of View on Buffalo Bayou, a multi-year contemporary art project that will introduce innovative public art within the environs of Houston's historic waterway.

NORTHEAST FIELD OFFICE

REPORT FROM THE CENTER'S OUTPOST IN NEW YORK

The Center's office in New York state supports projects in the northeastern United States. It is located in the 19th-century industrial city of Troy, across from where the Erie Canal once entered the Hudson River, in the exact middle of the CLUI Northeast Interpretive District, which spans from Pennsylvania to Maine.



Up River exhibit opening at the PARC Foundation Gallery in New York City.

PARC photo

Up River Show Floats Around the Hudson

Up River: Points of Interest Along the Hudson From the Battery to Troy is being exhibited up and down the river that is its subject. *Up River* was on display last summer at the PARC Foundation Gallery in Bleecker Street in Manhattan. It was then displayed at the Rensselaer County Historical Society in Troy, at the northern end of the Hudson River. Drifting downstream, it was on view in May 2009 at the Beacon Institute, located in the town of Beacon, roughly midstream between Manhattan and Troy. *Up River: Man Made Sites of Interest from the Battery to Troy* is also a book, published in 2008 by Blast Books, which reproduces the over 80 aerial photographs in the exhibit.



Neil Caplan of the Bannerman Castle Trust is seen here being interviewed by the *NY Times* while floating next to Bannerman's Island, as part of a series of excursions on the Hudson River arranged by the CLUI in 2008, aboard the CLUI boat *1/10th Moon*, as part of the *Up River* Program.

CLUI photo

CLUI Displays Work About Massachusetts

Thirty images of thirty locations from the CLUI database were exhibited at MassMoCA (Massachusetts Museum of Contemporary Art), in North Adams, Massachusetts. The show, entitled *Badlands: New Horizons in Landscape*, was on view from May 2008, to April 2009. A catalog of the exhibit was published by MIT Press (see book reviews on page 30).

Lectures Around the Northeast

Over the last year, the Center's director, Matthew Coolidge, has been invited to talk at several academic and museum locations around the northeast. At an interesting landscape/cinema symposium based at Hamilton College and Colgate University in upstate New York, he described the *Up River* project as a nonkinetic yet cinematic portrayal of the landscape of the Hudson, presented in the context of Peter Hutton's Hudson River film *Study of a River*, and other landscape filmmakers showing there. The conference was largely organized by Scott MacDonald, a historian of alternative cinema.

Coolidge spoke in May 2009, at the Rochester Institute of Technology, in the Caroline Werner Gannet lecture series. He was able to enlarge on some of the work of Ed Burtynsky, who spoke a few months earlier in the series, and to explore the landscape of Rochester, that upstate city, home of Kodak, the industrial wellsprings of photographic imaging.

Last fall, at the Dia Art Foundation in New York City, Coolidge was asked to base a talk on one of the artists in their collection, which includes landscapers such as Robert Smithson. Coolidge chose to talk about the Hudson River School. The Dia's collection of Hudson River School paintings and drawings was assembled by Dan Flavin, who started collecting the images in the 1970s, with the support of the Lone Star Foundation, a Texas-based precursor to Dia. Flavin intended to use these images in his Flavin Institute of the Hudson Highlands, to be based in Garrison, New York, where he lived for a time. Dia purchased a large house for this purpose, a monumental unfinished Moorish-ish structure, known as Dick's Castle. However plans changed, and Flavin instead established the Dan Flavin Art Institute in Bridgehampton, and the Hudson River collection went on semi-permanent loan to Vassar College.

At the New Museum, in fall 2008, Coolidge spoke on a panel called *New York: Past, Present, and Possible Future*, which looked at the Hudson River landscapes of yesterday, today, and tomorrow. The panel was related to the New Museum's exhibit *After Nature*, up at the time. Representing the past was Eric Sanderson, leader of the remarkable Mannahatta Project, which has reconstructed the appearance of Manhattan Island, as it was in 1609. The writer Matthew Sharpe represented the possible future by reading from his novel *Jamestown*, set in a future Manhattan. Coolidge was on hand to represent the present.

Additional appearances in New York included a panel discussion at the Museum of Modern Art. Moderated by the museum's director, Glenn Lowry, the panel was a discussion between Matthew Coolidge, representing the CLUI, and the Neue Slowenische Kunst group IRWIN.

In November, Coolidge made a second visit to Yale (the first visit, a year earlier, was to talk at the Forestry School), this time at the invitation of the Yale School of Architecture. The school had published an account of the Center's tour around the Great Salt Lake in *Perspecta 41: Grand Tour*, the Yale Architectural Journal (see book reviews on page 30).

In December, Coolidge gave a talk at the Smithsonian American Art Museum, in association with the show *Georgia O'Keeffe and Ansel Adams: Natural Affinities*, up at that time. Though no one can deny the importance of the work of those two legends of landscape art, the CLUI had more of natural affinity with the exhibit of Frank Gohlke's photographs in the gallery next door. ♦

THE DESERT RESEARCH STATION REPORT FROM THE CENTER'S MOJAVE OUTPOST



Creative research into land use, science, culture, and interpretation in the high desert fringe of California's southland continues at the CLUI research site north of the small community of Hinkley, near Barstow.

AMONG THE VARIED PERIODIC USES OF the Desert Research Station (DRS) is supporting biological studies related to the region. This year, researchers from the University of Utah's Dearing Lab used the DRS as a base to conduct research into species of animals that carry the Hantavirus. Hantavirus is carried by deer mice, wood rats, and other small desert rodents, and is a perennial problem in desert environments, especially those dramatically effected by human use. The researchers from the lab study the movements and behavior of woodrats (also called packrats), in the region by trapping, tagging, and dusting them in a harmless fluorescent talcum powder. Glowing rodents: another unique occurrence for the DRS! ♦

See the Dearing Lab video at: <http://www.time-science.com/timescience/projects/dg-mouse/interactions.mov>

CLUI VISITS MINE IN NORTHERN SWEDEN FARFLUNG FIELD REPORT

Occasionally the CLUI is invited to conduct some research or provide some programming or consultation outside the USA. Though beyond the realm of our typical subject matter – the USA – these opportunities help us maintain an awareness of the universality of conditions and phenomena, and provide opportunities for discussion in the international arena. Trends, notions, and perspectives gleaned from international sojourns provide a broadened context for our domestic projects. It helps to think globally, while acting provincially.

IN MARCH, THE CLUI VISITED KIRUNA, Sweden, a mining town located 145 kilometers north of the Arctic Circle. Kiruna is the northernmost city in Sweden. The town is dominated by Kiirunavaara, a mountain that contains one of the most valuable iron ore bodies in the world. The planned expansion of the mine and the accompanying subsidence of the ground means that most of the town of Kiruna must move over the next few decades. In the short term, several buildings, including Kiruna's city hall, must be either relocated or demolished.

With this move in mind, professors Ingo Vetter and Florian Zeyfang of Umeå University brought a group art students to take part in a series of



Gaining new perspectives from Kiruna, in northern Sweden, from the overview above town . . .

public forums to conceptualize the future of Kiruna. CLUI chief analyst Erik Knutzen and artist Åsa Sonjasdotter came along to help frame the discussion.

Vetter and Zeyfang oriented students and visiting guests with a series of tours. We began with a trip deep into the iron mine itself, which is operated by state owned LKAB. The company's own tour bus took visitors to a museum, theater and cafe located one kilometer underground in an unused mine shaft. Utilizing a network of over 400 kilometers of underground roads, LKAB extracts high quality iron ore in the form of magnetite, which it processes on site into pellets for use in the production of steel around the world. After screening a wide-screen video production detailing the hundred year history of the mine, our group viewed exhibits, mining equipment and enjoyed cookies and tea in an underground cafe which featured a view of an active mine elevator used to lift heavy iron ore to the surface.

The next day Vetter and Zeyfang organized a visit with Sami reindeer herder Nils Anders Kuhmunen, and enjoyed a lunch of bread and reindeer meat in his circular wooden hut. The Sami are an indigenous people who occupy a swath of the arctic across northern Norway, Sweden, Finland and Russia. There are issues with reindeer herding patterns and plans for where the town of Kiruna will move.

Both at the public forum and at a class session for the art students, Knutzen showed images from the CLUI's archives of American towns displaced by mining and the construction of dams, demonstrating some of the precedents for the future they face. ♦



. . . to the underground: approaching the mine in the company bus.

CLUI photos

CLUI BUS TOUR OF TRASHSCAPE WANTON WASTENAUT'S DUMP ODYSSEY

LAST FALL, THE CLUI CONDUCTED A public tour, called *A Trip to the Dump*, as part of the exhibit *Post Consumed: The Landscape of Waste in Los Angeles*. Even though the tour was headed to a garbage dump, the tickets sold out in 14 minutes. Clearly there is a hunger for trash.

The tour bus left from the Center's exhibit space next to downtown Culver City on the west side of Los Angeles, and we began our journey together down the waste stream. The main destination was Puente Hills, the largest landfill in the region. But there were a few stops to be made along the way, and lots of things to talk about.

Our first stop was the Central Los Angeles Recycling and Transfer Station. In many ways it's a typical transfer station, one of dozens in the city, but unique in that it is owned by the City of Los Angeles. Most transfer stations are owned by private waste hauling companies, especially by the two titans of waste hauling in America, Allied Waste, which bought Republic Waste for \$6 billion last year, and bought another large national trash company, BFI, a few years before that—and Houston-based Waste Management Incorporated, the largest waste hauling company in the country.

The City of Los Angeles purchased this transfer facility recently, as part of an effort to regain control over their waste handling needs. Before owning their own transfer facility, the city was dependent on private waste companies, who could set almost any price, as it was the city, and not them, that was ultimately responsible for getting the trash off the streets. With the closure of all the city-owned landfills over the last decade, the city was already dependent on private haulers for disposal, and the costs for transfer services seemed to be going up continuously, maybe due to the decrease in competition created by consolidation. They bought this large transfer station, centrally located south of downtown last year, from BFI, for what most considered an exorbitant sum. But they had to have it.

The nice clean white luxury tour bus drove through the gates of the transfer station, and pulled up to one of the open sides of the shed. Exiting the bus, the smell was dramatic. After we soaked it up for a while, watching the trash get pushed around in the shed, the engineer for the facility took the group upstairs to the offices, which though cramped, were more quiet, and had open space because they were gutted, with even the walls removed, due to mold. Windows from this level looked down on the transfer operations, and Gregory Carter, the equipment supervisor at the site, described the process going on below.

The big cement-floored shed was split into two levels. Trash trucks come in on the main floor, the upper level, and drop their load. Front loaders crush and consolidate the trash, then push it into open-topped haul trucks, which wait in a drive-through trench that runs along the main floor. The use of these trucks, larger than the usual garbage trucks that circulate through neighborhoods picking up trash, reduces the number of trips to the landfill. This is especially important as the landfills get further and further away from the city.

Another function of the transfer facility is to help reduce the volume of the trash, as usually it's the volume, not the weight, that limits the amount of trash that can be moved in a haul truck. Large front-end loaders are used to smush and crush the trash as it comes in, as well as to move it around.



The group is transfixed by a mound of trash at the Central Los Angeles Transfer Facility, first stop on the CLUI tour of the trashscape. CLUI photo

Most municipal trash still comes in trash bags, which is easier for the people who throw it away, but not very helpful from a waste hauling and disposal point of view. Trash bags hold air, which increases the volume of the waste. At the landfill, trash bags trap the gas emitted by decomposition occurring inside, and actually inflate, causing destabilization of the landfill, and slowing the overall decomposition of the waste. One of the functions of the loaders at the transfer station, and at the landfill, is to pierce the trash bags as much as they can.

After watching the mechanical trash ballet for a while, and getting questions answered, the group got back on the bus, and headed onward. This part of town, around Washington Boulevard and Santa Fe Avenue is a major distribution hub for the city. We pass a large FedEx building, and imagine that all the stuff being rushed around in and out of there, more or less finding its way to the front doors of the city, will go out the back door, and find its way, eventually, via another sort of delivery service, back to this neighborhood.

The bus continues through this district of waste, down 15th Street, a gauntlet of scrap handling companies and recyclers, where beat-up pickups line up piled high with metal and cardboard scavenged from the cityscape, like urban ore. Past the "gentlemen's" clubs, which no doubt take some of the cash earned by the scrappers and truckers, like the saloons and brothels of the mining towns once did from the miners of a century ago.

Leaving the urban wastelands for a bit, the bus rises up onto the elevated freeway, and a video introducing the Puente Hills landfill is shown on the overhead monitors. It's part of a National Geographic series called *Megastructures*, an episode devoted to Puente Hills, called *Garbage Mountain*. The hyperbolic narration and heavy metal guitar pumps up the anticipation building in the bus. Clearly we are entering epic territory.

On the 60, we soon see Puente Hills, only 20 minutes from downtown L.A. The hills are natural, though they have been recontoured considerably by the landfill. Rather than build from the flat ground up, on low terrain, such as in New Jersey's Meadowlands, or around the shores of San Francisco Bay, where most hills are actually garbage mounds, Southern Californian landfills for the most part are formed against existing hills and mountains, by filling in canyons, and building out sideways. In the case of Puente Hills, the original geomorphology is hard to determine, as so much of the small mountain range has been extended outwards by over 30 years of landfilling.

A TRIP TO THE DUMP

Puente Hills is operated by the county, and is the primary destination for trash from more than 5 million people. It has one of the lowest disposal fees in the region, so commercial waste haulers in the region head there first. Puente Hills also has a daily limit of 13,000 tons, and it closes its gates when this limit is reached. The time of day this limit is reached changes depending on traffic and flow. Haulers can call or go online to receive the latest on current tonnage and estimated closing times. If the landfill closes before 5pm, other landfills and transfer stations are recommended.



Landfill engineer Ted Brodeur leads the group at Puente Hills.

CLUI photo

The county operates a few other landfills and transfer stations, but none come close in size to Puente Hills. We pick up our briefer, Ted Brodeur, one of the principal field engineers designing the landfill as it grows, at County San's headquarters on Workman Mill Road, then head towards the gates. The entrance is like a toll plaza, and each loaded trash vehicle is weighed, and scanned for radioactivity. As many as 1,600 trucks will visit the landfill that day, but only one gleaming white tour bus will visit.

To get to the active part of the landfill, we drive up the side of it, on a road of switchbacks, with a paved surface that undulates dramatically. We are actually driving on trash, on a covered and vegetated face of the landfill, and the ground is unstable as the trash is still breaking down. We crest the top, and head towards the active landfill area, a massive open field of churned earth and dozens of truck operations: waste trucks dropping trash, front-end loaders, and giant tracked bulldozers moving and packing the trash, graders moving dirt, water trucks keeping the dust down.

The group gets off the bus to soak up the site. It looks like the ground is being graded and prepared for a subdivision that never gets built. Drainage pipes, gas collection pipes, swales, and liners are engineered into the ground for each cell. Some cells take a year or more to fill. Meanwhile the next one is being prepared, on another part of the mountain. Dirt, some of it from excavations at the site, some of it clay soil brought in from construction sites in other parts of the city, and some of it mulch from the on-site greenwaste handling area, is mixed in with the trash, and provides a complete cover by the end of each day. There are no rats or stray dogs, few smells even, and the active part of the landfill is hard to see from the surrounding neighborhoods. The main way that debris moves off site and into the surrounding neighborhood is by scavenging birds, mostly seagulls. But the county employs some unique measures to keep birds away from open trash areas, such as a web of wires held aloft by movable poles, and even remote-controlled model airplanes buzzing around to scare them off.



Motorcoach dump safari at Puente Hills.

CLUI photo

On the way down the hill we see an angular engineered valley more than 100 feet deep, lined with black plastic—the next cell, nearly ready for use. We pass by the gas-to-energy plant which burns the methane which is collected from the decomposing waste, through 30 miles of collection pipes buried in the landfill. The plant generates as much as 50 megawatts, enough to power around 70,000 homes. Leachate, the liquid effluent from the lined portions of the landfill, is collected in another network of buried pipes, connected to a water treatment plant nearby. Before 1989, the active parts of the landfill were unlined. Groundwater wells around the landfill are monitored for contamination that migrates off site.

The bus stops in at the County's Puente Hills Material Recovery Facility (MRF), at the bottom of the hill, the largest "mirf" in the nation. The massive shed and trash sorting facility was constructed a few years ago with the future in mind, as in the future, trash volume will need to be even further reduced as landfill space shrinks. The sorting floor, a few acres in size, is an initial sorting zone, where the piles that come out of trucks are broken down into general material categories, such as glass, plastic, cardboard, paper, and metals. What is clearly trash is pushed into trenches where waiting trucks take the material to the landfill. Recyclables end up on the conveyor, and move to the other side of the building for hand sorting.

The hand sorting area is like a factory de-assembly line. It is an elevated metal platform, a few hundred feet long, with a conveyor belt running through it. As the stream of trash moves by, one of up to thirty people working the line pull out a designated type of recyclable item, and drop it down a chute to a waiting bin or pile area. Mechanical discs and vibrating surfaces also help sort the material. What remains on the conveyor after passing through the line, is trash.



The very clean "dirty MRF" hand sorting conveyor in the largest MRF in the country, at Puente Hills.

CLUI photo

A TRIP TO THE DUMP

The tour group watches the process from a gallery that runs the length of the building, where windows look down on both the pre-sort and hand-sorting operations. It appears very clean and orderly. Open a window on the pre-sort side, and the echoing noise of machinery comes in, along with a vanilla odor: misters in the ceiling are scented to mask the smell that comes along with even this, relatively clean trash. This MRF was designed to be a “dirty MRF,” capable of taking raw trash and extracting recyclable material. It may take on that role as the pressure to reduce waste volume increases. In the meantime, the MRF accepts up to 4,000 tons of relatively clean trash from prescreened sources, known to have a high percentage of recyclable material, only around 100 trucks a day.

The expansion of the MRFs role is dependent on the politics, policies, and permitted future of Los Angeles’ trash. The Sanitation Districts, owners and operators of the Puente Hills landfill and MRF, is currently preparing a megafill in the desert 200 miles away, and hopes to have a second one available soon too. If all goes according to their plan, an intermodal facility will be built next to the MRF, packing material onto waiting railcars, for its journey to the desert dumps. If this happens, then the MRF becomes a major trash sorting site, the last chance to extract recoverable materials before the long and expensive ride by rail to the distant dumps.

Diversion of materials out of the waste stream is the key to reducing trash volume, as well as the associated, expensive, hauling. And diversion means the recovery of materials that are reusable, resaleable, or recyclable. As the cost of disposal goes up, so too does the value of recoverables, diverting more from the flow, and causing the waste stream to shrink to more manageable and reasonable levels. That’s the idea. Today, California recovers (diverts) around 50% of household wastes, an amount required by the law which created the blue and green bins for recyclables and greenwaste. The state is debating how to reasonably legislate the further reduction of waste.

We eat a late lunch at the cafeteria of the County Sanitation District headquarters, more aware than ever of the places our containers and foodscraps are going. We then visit the other side of the Puente Hills, the Rose Hills Memorial Park, whose border runs along the crest, adjacent to the landfill. The relationship is more than cartographic. Once, the county was hoping to expand the landfill, but eminent domain laws prohibit condemning cemetery land. The juxtaposition has other curious components too, such as the fact that both land uses are about burial, on a large scale, on one hand to forget, on the other to remember.

Rose Hills is a very large cemetery. Company literature claims that its mortuary serves more families than any other in the world. It began in 1914, long before the landfill, and had expanded to its present 2,500 acres by the 1950s. To stabilize and contour the rugged ground, the owners estimate that they have moved an amount of earth equivalent to 1/6 the amount that was moved to build the Panama Canal—an amount that may approach that of their earthmoving neighbors, next door.

The bus lumbers up through the segregated districts of the dead: *Covenant Lawn* for Jews, *Trinity Lawn* for Catholics, *Deseret Lawn* for Mormons, *Cedar Crest Lawn* for Islamics, *Lutheran Lawn* for Lutherans, *Masonic Lawn* for Masons, and a Buddhist columbarium built in 1999, with the largest Buddhist pagoda in USA. We head to a service area on the edge, near a former Nike Missile antenna, overlooking the landfill, the cemetery, and downtown Los Angeles in the distance. In front of us is a dumpster full of discarded wreaths and dead flowers. We roll back down the hill, ruminating on the implications of internment and decay.



The CLUI tour bus heads back to town on Highway 60, passing the landfill/superfund site in Montebello. CLUI photo

Back on the 60, heading west, we pass the Operating Industries Incorporated dump site in Montebello, a mound rising abruptly next to the freeway. The dump started in the 1950s, by filling a hole in the ground, a former quarry for rock that was used to build the freeways. In the 1960s, Highway 60 was built through the dump site, which continued to accept waste until 1984, when it began its next life as a remediation site. As a landfill, it had received 30 million cubic yards of solid waste (to visualize this, a refrigerator is about one cubic yard), and 300 million gallons of waste liquids, much of which we consider now as hazardous waste. With no lining, the liquids and leachate have moved offsite through the groundwater, and the federal government put the site on the Superfund priority list for clean up, a process that has been started, but is expected to take a few decades, and cost over \$1billion. Such is the fate for one poorly managed waste mound, one of dozens in the L.A. basin.

On the final stretch home, we watch a section of the ‘70s sci-fi film, *Soylent Green*—the part where Charlton Heston sneaks onto a garbage truck to see where it goes. His character in this dystopic film arrives at an industrial site, a big shed, where waste is treated and formed into recycled wafers along an assembly line—remarkably similar to what we saw at the MRF. (The scene was shot, suitably, at the Hyperion Treatment Plant, L.A.’s principal liquid waste treatment plant, often used as a film location for dystopic industry, as it was for *Logan’s Run* and *The China Syndrome*). Where the garbage trucks go, and what Heston’s character discovers there, is a shocking form of recycling gone mad: *Soylent Green is people!* ♦



The dumpster at the cemetery and the disposal site for the spent, decaying, and forgotten memorial wreaths—it doesn’t get any more terminal than that. CLUI photo

A report about the trip by Matthew Brunwasser aired on National Public Radio, and can be listened to at: <http://www.npr.org/templates/story/story.php?storyId=93301844>

FIELD TRIP THROUGH A STEELSCAPE STUDENTS MAKE EXHIBIT ABOUT THEIR EXPERIENCE

In Fall 2008, Matthew Coolidge of the CLUI led a field trip through the region around Gary, Indiana, one of the most unattenuated landscapes in the nation. The purpose was twofold: to work with students from a class called Land Arts of an Electronic Age, taught by Julia Christensen from Oberlin College, and to continue research into the region for future CLUI projects.

IT'S A BIT OF A DRIVE to get from Oberlin, which is near Cleveland Ohio, on the southern shore of Lake Erie, to Gary, near Chicago, on the southern shore of Lake Michigan, so we leave early in the morning. We stop for a break at Elkhart, Indiana, for a visit to the RV/Motorhome Heritage Center, where RV industry historian Al Hasselbart speaks to the group about the history and status of the RV industry, which is centered around Elkhart (described in the Spring 2008 issue of the *Lay of the Land*). We use their nice clean restrooms and eat a picnic on their lawn, next to Interstate 80.

Getting into the steel zone, our first stop is the Gary Historical and Cultural Society Museum, which is celebrating a new exhibit and holding an open house event. The museum is located in a small clapboard building, outside the gates of the massive U.S. Steel plant to which the town is wedded. The museum's Director, Dolly Millender, shows us around, and we watch several videos, and look through their archives of old newspapers and publications about Gary.

In general, the displays are mostly newspaper reprints and town life photos. Strangely, or perhaps not, there is little mention of the U.S. Steel plant which is the 10-zillion pound gorilla next door. The intention of the museum is to tell the domestic story of the people and the city, and to spread the good news about the normal, regular community of Gary—a story that is rarely, if ever, told. In order to do so, it seems, the plant has to be left out of the picture. "I have no trouble with them," says the Director, referring to U.S. Steel, however she acknowledges that this is not a common position among residents of Gary. Born and raised here, she is just tired of the town getting slammed. Not too many people come to Gary because they hear it is a *nice* place.

When newscaster Peter Jennings visited in 2002, for example, and was very polite and impartial, people like her in the community opened up to him because he seemed to want to listen to their version of the place. When the report was edited and aired on national television, however, it presented the typical, dystopic version of Gary as crime infested, corrupt, and physically crumbling. The town responded with meetings and booster events, including a "roast" of Peter Jennings.

There may be another reason why the curators might be leaving such a big hole in their representation of the history of the city. Apparently there were displays about the plant in an earlier version of the museum, information panels provided by U.S. Steel, but they were damaged when the building caught fire in the late 1980s, a fire of suspicious origin, which some say was set by people in town who didn't like that version of the museum.

We drive around town, walk through empty public buildings with their doors off. Downtown is blighted for sure, in superlative and shocking ways, but off the main drag, much of the city is simple homes, and regular people, living their lives in relative peace. Like most places.



Portraits of the first and last mayors of Gary, Indiana, at the Gary Historical and Cultural Society Museum. CLUI photo

We then head out to the interstitial space on the lakeshore, between Inland Steel and U.S. Steel. This is a zone of ruins, remnants, pieces, incidentals, bulk materials, and fragments. There are no fences, just unfinished transitions. We end up at a large concrete ruin, more than a thousand feet long and several stories high, a structure where limestone was once stored and handled for the steel plants. The cavernous hollow spaces are like the ruins of the Roman Baths of Caracalla.

But this empire is yet still alive. As the day wanes, across from us in the gloaming the sodium lights and furnaces at Indiana Harbor pierce the darkening industrial shore, where the plant covers five square miles of an artificial peninsula, jutting into Lake Michigan. Though it isn't what it once was, the reports about the death of steel in America are greatly exaggerated.

Students explore this transitionscape of ruins, take photos, make field recordings, and have discussions. Then off to the Holiday Inn Express at Portage. Dinner at Quaker Steak & Lube, a car-service station themed restaurant chain. Fill 'er up.

The next day we head off to another local history museum to get more background and orientation. We meet Rod Sellars of the Southeast Chicago History Museum in Calumet Park, just over the Illinois State Line. The museum is a small space inside the park's field house, packed so full of artifacts it is hard to move. It is a real treasure trove of maps, photographs, paintings, and other imagery and information about the region, and Rod knows his way through it, intimately. He takes us out for a tour through the once and present industries of southeast Chicago,

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Students on the CLUI field trip getting oriented by Rod Sellars in the jam-packed Southeast Chicago Museum, in Calumet Park. CLUI photo

GOING WITH THE FLOW

FLOWING THROUGH TEXAS' LIQUID PETROCHEMICALSCAPE

This spring the CLUI led a public boat and bus tour through the petrochemical artery of Texas. The tour, entitled Downstream: A Tour of Houston's Water and Oil, took place twice, on March 20 and March 21, 2009.

THE TOUR WAS ABOUT HOUSTON, AS oil city, and Bayou city; its past, its port, its drainage, and its existence as the epicenter of the World of Oil. The tour was about how the history and infrastructure of the city's water precedes and supports the economy of petrochemicals: how oil floats on water. It combined a water journey, downstream, on the city's primary drainage corridor, with a land journey, by bus, snaking through the petrochemical production zones that are clustered along the south side of the bayou, the *downstream* end of the oil industry. Down on the water, and up on the land, fueled by oil—the product that made the modern city of Houston.

The journey was historic for other reasons too. It was the first public tour—in a long time and possibly ever—to travel the length of the Buffalo Bayou from downtown Houston, to its confluence with the San Jacinto River, traversing the entirety of the Buffalo Bayou portion of the Houston Ship Channel. Security measures along the Ship Channel, one of the world's largest petrochemical ports, prevent casual visitation, and restrict public access. Permission for the group's tour boat to pass was obtained only after months of negotiations with local officials and the Coast Guard.

The route connected two historic anchors of the region, Allen's Landing, where the tour boat departed, and the San Jacinto monument, where the boat landed, three hours later. Both these sites are regional loci, moored in 1836, when the Allen brothers established the city of Houston at the landing that now bears their name, and when the 18 minute long battle of San Jacinto took place, at the other end of the bayou, winning Texas from Mexico.

Traveling down the bayou, we also moved through levels of scale, from the local and municipal, to the regional, statewide, and international, mirroring the rise of Houston from a southern cotton town, to global oil titan. Temporally, from the historic core, we move backwards—from the beginning, to the present.



The chartered tourboat, called the "Houston Party Boat," arrived to pick up passengers at Allen's Landing, the historic core of Houston, in the shadow of the county jail. Based out of Kemah, the boat normally plies the corporate and wedding party trade in the open waters of San Jacinto Bay, far beyond the Ship Channel and Houston. This tour was the first time a commercial tour boat came up the Bayou, maybe ever. CLUI photo

Point of Embarkation

The tour began with people boarding the Houston Party Boat, which had been chartered for the event. A 50-passenger pontoon vessel, the Houston Party Boat was the largest tour boat that could be found in the water within 100 miles, with a small draft, capable of navigating the shallow and debris-strewn waters of the upper bayou.

"Captain Jim" let people on board one at time, checking names off a passenger list that had been submitted to and cleared by the Coast Guard, the week before. On departure, the tour guide, Matthew Coolidge, of the CLUI, welcomed the group, and began the narration.

They call Allen's Landing the "Plymouth Rock" of Houston. Like most river cities, Houston began at a confluence, where one river flows into another (in this

case White Oak Bayou, flowing into Buffalo Bayou). It was here, in 1836, where the Allen Brothers laid out a grid and started selling 50 foot by 100 foot lots, for \$25. They had just purchased the land, 6,000 acres, for less than a dollar an acre. The lots sold, and the city grew, replacing the more established community of Harrisburg, 6 miles downstream, which had been burned the previous year by the Mexicans.

Though this historic core has been recognized as such by the City, which rebuilt the landing as a park some years ago (which enabled our tour boat to land), development has historically turned its back on the area—many of the old warehouses surrounding the historic turning basin at the confluence have been turned into jails. The Harris County sheriff's department (third largest in the nation), maintains beds for 10,000 prisoners in three adjacent buildings overlooking the Bayou here. We imagine the prisoners watching through the slitted windows, as we escape downstream.

Passing under the prison bridges of downtown, we transcend interpretive layers, launching from the historic progenitive interpretive site, surrounded by public art, plunging into the midst of the unmarked perils of the present, going with the flow down the dirtiest river in Texas.

Houston is all about watershed. It is flat, and much of it a drained swamp. Getting the water off the land, so it could be developed, meant shedding it of water—making the landscape dry, meant intensifying the waterscape. The drainage corridors that condense and move the billowing rains that douse the area are now engineered superhighways for shedded water, under ideal conditions.

The Bayou of the Bayou City

The Buffalo Bayou is the trunk line for the city's drainage, capturing the flow from several other major bayou watersheds (Brays, White Oak, and Sims, to name a few). For over 300 square miles of hardscape—parking lots, streets, highways, and roofs—Buffalo Bayou is the only way out.

The Bayou technically begins twenty miles west of downtown, in the suburban prairies near Katy. From there the bayou flows to the "energy corridor" along Interstate 10, where so many of the major oil companies have their corporate offices, and it enters one of the largest rain runoff holding structures in the nation, the Addicks Reservoir. On the opposite side of the Interstate is the Barker Reservoir, a similar dammed retention area, containing the sacrificial lands of George Bush Park. The Interstate energy corridor is a narrow isthmus hemmed in by these regional catchment basins. As the water flowing overland into the city is captured, the corporations escape to the suburbs through the narrowed gap.

The federal government paid for much of these extreme flood control structures following a particularly disastrous flood in 1935. And they have been fairly effective, with notable exceptions in 2001 (tropical storm Allison) and last year's Hurricane Ike. During both of these, the water level of Buffalo Bayou was more than 20 feet above normal levels, high enough to flood several buildings downtown.



The Sunset Coffee Company building, former psychedelic club called the "love street light circus and feel good machine," future Bayou visitor contact station, and occasional island (seen here after Hurricane Ike in 2008.) CLUI photo

One of these buildings, the former Sunset Coffee Company building, is a battered, green, brick hulk right in the middle of the Landing. During these storm events, it was a flooded island. The building, which many a Houstonian has fantasized about turning into loft space, is currently owned by the Buffalo Bayou Partnership, which plans, someday, on turning it into their offices and the visitor center and access point for the Bayou, where people can get information about the Bayou and its recreational offerings, rent kayaks, and buy maybe coffee, too.

The Sunset Coffee Company Building is an emblem of one aspiration for the land and buildings along the upper bayou: redeveloped post-industrial, part of a retooled recreational residential inner city. Some lofts and townhomes have taken root in the area. It is also a reminder of the international port which looms a few miles to the east, where proximity to Mexico, and Central and South America brings commodities like coffee through this city first, and in large quantities.

Cotton was of course the main commodity for Houston for the 19th and early 20th century, not just the fluffy part, but cottonseed, and the oil it contains. The port was along the upper bayou, where rail met the water. The bayou at that time was dredged to 9 feet, and continued to be developed eastward, as downtown densified. After the 1900 hurricane in Galveston, Houston became the region's inland port, and by 1915, the bayou was dredged to a depth of 25 feet. Industry thrived, and the oil refineries began appearing. But the deep dredging stopped at the end of the newly created Ship Channel, further downstream. This, the upper industrialized bayou, began its transition into an early 20th century relic.



The Caroline Street waterfall.

CLUI photo

Onward, Downstream

The tour flows out of downtown, and passes a Euclidean waterfall otherwise known as the Caroline Street Gully. This was once a natural ravine, that became a drainage gully, and was eventually filled in to create level land, and become a submerged storm drain, with geometric pipes to move the storm water to this outfall. The Bayou here is a chaotic gouge through the city, providing a cross sectional cut where layers of time and infrastructure are exposed. The shores here have high walls, that in storms accommodate rushing water.

Unlike the other bayous of the city, which were straightened and recontoured to move more water, faster, the Buffalo Bayou downstream of downtown, was allowed to run a little more wild. Partially, at least, because this was a less affluent part of Houston, with industries and immigrants. The sides of the Bayou crumble on the outer curves, undermining asphalt, exposing layers, like buried railroad beds.

The convergence of layers of the city reach the point of poetry at a bend in the Bayou a mile downstream from Allen's Landing, at a place called Frostdown. The name comes from a small community that predates Houston (it was here that the Allen brothers stayed when they were buying the land that would become Houston). Next to Frostdown is the abandoned Houston Belt and Terminal Railway Bridge, a lift bridge built in 1912, representing Houston's period as booming cotton and rail center. The curious thing about this lift bridge is that it is stuck tucked underneath the highway 59 flyover, never to rise again (its massive concrete cantilever counterweight lopped off, and placed out of the way on the shore). This represents the postwar, modern Houston, the 1950s flight out of the city and into the suburbs, via one of the most systematically designed freeway networks in the world. On the shore, on Nance Street, a large nondescript building houses switching equipment for one of the main electronic networks in the city, operated by Level 3 Communications. All these stratigraphic temporal layers visible from one point on the bayou, itself the waterway that created the city, and keeps it drained, to the extent possible.

On shore, the tour passes James Bute Park, much of which covers the 15 acres of undevelopable land under the freeway, where the missionaries come to feed and proselytize to the legions of homeless that collect at this forgotten corner of the city. The best way to a person's soul, they say, is through their stomach.

By the 1950s, the bridges over the bayou were not required to lift, as little commercial traffic came up this far. One of the few remnants of large scale industry

on this part of the bayou is a concrete grain silo, now owned by the Buffalo Bayou Partnership, another future park, connected to the sporadic bike trail that is growing along the edge of the bayou. The bayou by now is leaving the zone of the potential condo, and is entering into a medium industry zone. On the shores are contaminated industrial grounds, plating companies, former metal fabrication shops, warehouses being torn down to become brownfields.

Then, KBR looms. Though not the headquarters for the company (that is downtown), nor the largest industrial site for them (that's in the suburbs), this facility, a ten story office tower surrounded by engineering sheds and parking lots, was once one of their primary engineering sites, and it is still very much in use. KBR (formerly known as Kellogg, Brown and Root) is a legendary international construction, engineering, and infrastructure company, focusing on oil, energy, natural gas, and military contracts. It was formed by the integration of Brown and Root, a road building company that grew into a diversified construction company as a subsidiary of Halliburton over 44 years, and the MW Kellogg Company, a construction and engineering company specializing in refineries and power plants. In 2007, KBR became independent of Halliburton. It is still headquartered in Houston, and employs 50,000 people around the world.

Across from KBR, a little further downstream, another Buffalo Bayou Partnership-owned site, the former junk yard where the CLUI has its field office. This is also the location where trash that floats down the bayou is collected. The Mighty Tidy skimmer boat (painted pink by the local artist team The Art Guys), which used to ply the Bayou, scooping floating trash into its arms, sank in Hurricane Ike, and is unlikely to be put back online. Another vessel, a giant floating vacuum cleaner, is taking its place.

Every time it rains, floating cups, water bottles, basketballs, and nearly any other thing you can imagine that floats comes down the Bayou, sometimes in thick rafts, catching along the stubble of its banks. The clean up crews of the Buffalo Bayou Partnership, with the help of county misdemeanors doing community service, have floating booms tethered and moored at strategic points to trap the debris, which is then collected by hand, rake, or by the floating vacuum cleaner boat. A conveyor, painted pink like its deceased partner, the Mighty Tidy, lifts the collected trash from the water, over the bulkhead, to dumpsters on shore.

Directly across from this site is the most upstream, in-use heavy industry site on the Bayou, a busy metal scrapyard operated by Proler Southwest. The site is a cacophony of grinding, dumping, shearing, baling, and torching.

This site was started in the 1940s by the Proler family, who still operate a smaller site next door. Proler is a big name in American scrap. They invented the Prolerizer, a type of car shredder widely used in the industry. The main yard here, Proler Southwest, is now owned by Metal Management Incorporated, the largest metal recycler in the country. Formed by the merger of many "mom and pop" scrap companies, and the international scrap company SIMS, Metals Management is based in Chicago, and has operations in 14 states.

Since steel has little structural memory, the material is easily recycled. Around 2/3 of the steel made in the USA is from recycled stock. Scrap from yards like this is shipped all over the country, to "mini-mills" that melt it to make more steel. Much of the scrap metal in the USA goes to China, and used in their construction industry as rebar, floor decking, and beams. China is being built on the ruins of America, at least to some degree.

Floating further down, we pass a closed down sewage plant, and go under the bridge for Lockwood Road. The rectilinear and circular ponds of the plant are green with scum, and overgrown. Light industry intensifies in the neighborhoods on shore. Companies making scaffolding, saws, electrical supplies, cable. Then the silos and piles of Southern Crushed Concrete, which grinds up Houston's demolished building parts, making aggregate for more buildings. More industrial scale recycling, churning, digesting.

Turkey Bend is a former oxbow that was cut off to shorten and straighten the channel. Down the bend, more industrial and metal working, including a major site for Baker Oil Tools, though the plant is shrinking, and many of its 1960s art deco buildings along Navigation Boulevard are for lease with broken windows, as the company continues to join its brethren in the suburbs, and overseas. Baker Tools is part of Baker Hughes, one of the largest oil services companies in the world, focusing primarily on drilling technology. An accretion of related companies, the brand's history includes the Baker International Corporation, which has roots back to well drilling tools in California, and the Hughes Tool Company of Houston, run by billionaire Howard Hughes' father. Today the company still makes the industry-standard tricone drill bits used all over the world, and provides a variety of well development, monitoring, evaluation, and service technologies, employing over 30,000 people worldwide, and generating over \$10 billion in revenue in 2007.

DOWNSTREAM: A TOUR OF HOUSTON'S WATER AND OIL

The strange building looming on the left looks like a huge vent, which in fact it is. This is the sewage sludge drying plant for the 69th Street water treatment plant, the largest sewage plant for Houston, and one of five. A 12-foot diameter trunk line feeds to the plant, and the solids that remain after the water has been treated is processed here and distributed as organic fertilizer called Hou-Actinite. It is not unusual for cities to sell dried sewage sludge as fertilizer, but Houston has sold dried sludge for this purpose since 1930, apparently a pioneer in the field.

Then we pass the rest of the sewage plant, the big circular sedimentation tanks and rectangular aeration tanks, and the odor becomes strong. The outfall is mostly submerged, but the top of the pipe emerging from a bulkhead on the side of the plant is visible, and bubbling away. This is where most of the liquid waste from the city flows out of the network of pipes and plumbing, back into the world. Some say this is the cleanest part of the bayou – as the water entering the stream here, this mechanical tributary, is treated.

We pass under the Wayside Avenue Bridge, and make a final bend in this upstream part of the Bayou, passing Buffalo Bend Nature Park, another property owned by the Buffalo Bayou Partnership, where the land is being graded into terraces that trap the water as it flows overland and into the Bayou, reducing the pollution caused by surface runoff, and allowing the land to serve as a filter. This park is a model for other park-like development along the bayou, a passive water treatment system, which will help improve water quality, over time. Passing under a railroad swing bridge festooned with cameras, we enter into another realm: The Ship Channel.

The Houston Ship Channel

Captain Jim, who did much of the negotiating with the Coast Guard to get us here, and as the captain, is responsible for compliance, gets on the PA to explain what is happening: We are entering a security zone. In order to let us be here, the Coast Guard requires that we do not take any photographs. They will be watching us, from a network of cameras along the ship channel. They may board the boat and ask everyone for ID. This will be the situation for most of the rest of the journey, and he will let us know when we can take our cameras out again. Suddenly we feel like guiltless suspects.

We are in the turning basin, the upstream end of the fully industrial ship channel portion of Buffalo Bayou. If it ever did look like a bayou, it certainly doesn't now. The sides are all berths and bulkheads, and busy port space. On the left is the Port of Houston Pavilion, where the port's tour boat, the Sam Houston, docks. The Sam Houston was built in 1958 at Platzer's shipyard, on the Ship Channel, as an "inspection boat" to show visiting dignitaries the port. It evolved into a public tour boat, operated by the port, and is the way most people get a sense of the Port of Houston and the Ship Channel. The tours are free, and over a million people have been on board. But the Sam Houston trip is just an hour long and covers just a third of the Ship Channel. And the speil is the official presentation of the port.

On the other side of the turning basin are chemical tanks, holding material generally created locally, to be loaded onto chemical tanker ships. Tank farms operated by Jacob Steirn and Sons, Westway Terminals, and Global. A chemical tanker is docked, and its escape pod vessel is mounted poised, pointing down a chute on the stern, ready to plunge into the water in an emergency. This part of the channel though is mostly freight and bulk materials, non-petrochemical goods handled with warehouses and stevedores, a part of the port where people can still be seen operating forklifts and cranes. This, the Turning Basin Terminal area, is lined with 2.5 miles of warehouses, and 3 dozen docks.

The Port of Houston is one of the busiest ports in the country, and has more ships in it at any given time than any other, due to the large number of smaller chemical tankers and freighters that come and go. Unlike other ports, the Ship Channel handles very little containerized cargo, with the massive ships associated with that form of freight (the port does handle container ships, but mostly at two other locations, outside the Ship Channel, at Barbours Cut and Bayport). 6,400 ships come through port every year, and 200,000 barges. It is the largest port in foreign water-borne cargo in the country, meaning that it ships more goods out internationally than any other port. And 75% of that is petrochemicals, produced in the region, the largest petrochemical production zone in the nation. And we are not even there yet.

The bulk freighters at this upstream part of the port are headed to and from China, Europe, the Middle East, Asia, and Africa, though many are labeled as being Bahaman, Antiguan, and Liberian. They fly the "flags of convenience," like most of the merchant ships in the world, registered with nations which are not where owners are based, or where the traffic flows. This "open registry" system, developed largely by US businessmen after World War II, enables companies operating ships to register them in nations where fees are reduced, taxes evaded, union laws lax, and policies streamlined. Much cheaper and easier than registering in Europe or the United States, with their rules, fees, and taxes.

We pass a group of large gray freighters, the Cape Texas, Cape Trinity, and Cape Taylor, all registered at Norfolk, VA. These are Navy ships, part of the Ready Reserve Force fleet of 51 ships, deployed mostly at civilian ports around the nation, ready to support the deployment of military forces. 35 of these ships, including these three based at the Port of Houston, are "Roll on Roll off" ships, with big ramps that quickly connect to the shore, for driving fully loaded trucks, tanks, or other vehicles on and off. They are all staffed with a Navy crew, ready to go in either a 5 or 10 day period of readiness.



Ready Reserve Fleet ship, pointing down the Ship Channel.

CLUI photo

We pass the silos of Gulf Coast Portland Cement, and the epic scrap metal yard Derichebourg Recycling USA (formerly CFF), where school buses can be seen piled higgledy-piggledy in a twisted pile of scrap headed to the shredder. We are abreast of the town of Harrisburg, the historic town that preceded Houston, and which was sacked by Santa Ana in 1835, spurring the establishment of Houston at Allen's Landing the next year. Harrisburg was established at the confluence of Buffalo and Brays Bayous, and though little remains of the original town, it still feels like a separate community.

Brady Island formed at the site where Brays Bayou enters the ship channel. The island is connected to the shore, and is covered and surrounded by shipyards and drydocks, for Buffalo Marine and Houston Ship Repair, making and fixing ferries, fuel barges, tugs, and other small industrial vessels, but mostly petrochemical barges. Also on Brady Island is the white-tablecloth buffet restaurant, Brady's Landing, the only restaurant on the Bayou portion of the Channel, and one of the few places where the public can approach the shore. From the glass walls of Brady's Landing diners can watch the cargo ships from Germany unload Volkswagens into the company's storage lots across the Bayou.

Next to Brady Island is the port for the Rhodia plant, the first of the petrochemical plants downstream from downtown. Visible with two thin red and white stacks, Rhodia Eco Services Houston Plant is a major producer of sulfur dioxide and sulfuric acid. It is owned by Rhodia Eco Services, one of three sites in the area operated by the company. Rhodia is a leading maker of sulfuric acid and specialty phosphates. It is a French company, spun out of Rhone-Poulenc in 1998. The company's plants are often located near refineries, as sulfuric acid is used to make gasoline. It is also used in batteries, paper bleaching, and numerous other industrial applications.

Next to the plant is the Glendale Cemetery. As land developed for the petrochemical and port functions, cemeteries were often left as small pockets of undisturbed land, for obvious reasons. They have ended up as historical holes of greenery, surrounded by hyper-industry. Then, the Lone Star Scrap metal yard, at the base of the 610 bridge, which carries the east side of the inner loop that rings the city of Houston.

Between the Loops

Houston is like a target, with its downtown core at the middle of two concentric circles, the inner loop (highway 610) and the outer loop (Highway 8, the Sam Houston Tollway). The rings can be used like graduations, measuring the distance from the core. The radius of the inner loop is around 6 miles, and the outer about 13. The Sydney Sherman Bridge carries the inner loop over the ship channel—we are 6 miles out. The bottom of the deck is 135 feet above the water, according to the vertical graduations on one of the piers of the bridge. We are calibrated. And entering the petrochemical zone.

On the south bank, after the bridge, a chemical tank farm, mostly operated by Westway Terminals. Many small tanks, and curious smells. The smaller the tanks in the farm, the more diversity and complexity in the chemicals stored there. On the north bank next to the bridge are loading and logistics yards for engineered products, like propellers for wind farms, tubes and steel. Beyond that on shore the largest of the dredge spoil piles, piped slurry pumping mud from the bottom of the channel to rectilinear no man's land mounds next to highways, to constantly keep the channel's depth at 35 feet or more.

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Then the fractionator and flare towers of the first refinery: Valero Houston. With a throughput of 140,000 barrels of oil per day, this is considered a midsize oil refinery. It produces gasoline, diesel, kerosene, asphalt, jet fuel, sulfur, fuel oil and liquefied petroleum gas, employing approximately 300 people, on 250 acres. It was one of the refineries in the area built during World War II, in 1942, and has grown since then, changing hands often. Its current owner, Valero, bought it from Basis Petroleum in 1997. Valero, based in San Antonio, Texas, has grown rapidly through acquisitions, and is now one of the largest refining and gasoline marketing companies in the country, with twelve refineries and hundreds of gas stations.

Across the channel from Valero, at the top of a bend in the bayou, is the headquarters for the local Coast Guard and the office of the Captain of the Port (currently Coast Guard Capt. William Diehl holds this position). This is the security and port authority control center for the Ship Channel. The dozens of steerable cameras on towers along the port feed their signal to this building, where Coast Guard officers watch a bank of monitors and communicate with ships coming and going. The building is topped with a tower, which looks a bit like an oil derrick, but is for cameras and antennas. On shore is a boathouse for the fleet of small coast guard vessels, mostly the 25-foot Defender Class response boats that are now common sights at America's ports. These boats were designed, built, and procured as a direct response to the September 11 terrorist attacks, to be the security workhorses for the nation's harbors. They are small, agile, and fast, with twin 225 horsepower outboards, and machine guns fore and aft. Over 500 of them have been deployed since 9/11, from an order of 700 placed with the manufacturer, SAFE Boats International, of Port Orchard, Washington. As we pass, one leaves the boat house and follows us on our port side for a few miles, making sure we are behaving.

Beyond the Coast Guard we pass a corn syrup terminal, operated by Cargill, with a loading boom hanging over the water's edge like a poised soda straw, then a large metalworking shed. U.S. Steel used to operate the site, but it is now owned by O'Neal, a large family-owned metal fabrication company. Next to that are the twin storage domes of the Houston Cement Company's West Terminal, adjacent to another cement company, Holcim, a Swiss cement and aggregates company, with operations all over the world. Next to that the two drilling rigs rising up behind the cement plants indicate the National Oilwell Varco (NOV) company yard on Clinton Drive. NOV, based in Houston, is one of the largest suppliers of oil field equipment in the world, and has dozens of sites around Houston.

On the south bank we pass the Manchester Terminal, one of the biggest enclosed warehouse spaces on the port, with over a million square feet indoors. Sims Bayou enters the Ship Channel next to the terminal, adding the drainage of most of the south side of Houston to the soup.

On the north bank, U.S. Gypsum's Galena Park Plant, which has supplied the region with gypsum for wallboard since 1958. U.S. Gypsum has nearly half of the national market for wallboard, operating 10 mines and 20 plants in the USA. Next to U.S. Gypsum's shed is another looming storage structure, Public Elevator No 2, a concrete and steel silo used for wheat. It is owned by the port, and leased to Harvest States Milling. It has a capacity of 6 million bushels storage, equivalent to over 6,500 truckloads.

The grain elevator fronts on the Lyondell Turning Basin, a widened part of the channel allowing ships to turn around after loading up at the Lyondell Houston Refinery. This refinery has a capacity of 265,000 barrels per day of high sulfur crude, covers 700 acres, and employs over 1,000 people. It makes the usual list of fuels; gasoline, diesel, jet fuel, as well as lubricants, coke, and chemicals. It was one of the first refineries built in the region, in 1918, and was operated by Sinclair. It was later bought by ARCO, then became part of the original assets of the Lyondell Chemical Company, when the company was established as a spin-off of ARCO in 1985. The plant was operated jointly with the Venezuelan company CITGO from 1993 to 2006, but is now operated solely by the Houston Refining LP subsidiary of Lyondell. Lyondell, based in Houston, is one of the major chemical companies in the nation. It became part of a larger company in 2007, when it was acquired by the Dutch company Basell, becoming LyondellBasell, with 19 plants in the USA, 9 of them in Texas.

Following the loading rack for Lyondell, where a battery of hoses faces the water, each capable of handling a separate product, the tall stack of the Deepwater Power Plant comes into view. The plant is a major local supplier of electricity, operated by AES, an international energy and electric company, with around 25 plants in the USA. Deepwater uses petroleum coke, produced at local refineries, as a fuel. Two sets of high tension lines cross the channel here, heading north over the tank farms on the north bank. One of these tank farms is Kinder Morgan's Galena Park Terminal, a major hub for regional pipelines, pipelines that cross back and forth under the waters of the Ship Channel. Shell Lubricants operates a facility next to the terminal, on Clinton Drive, and a new tank farm for biofuels opened here, operated by Green Earth Fuels, and integrated into the distribution network at Galena Park.

On the southern bank we pass where Vince Bayou flows into the channel, generally unnoticed, next to the Gulf Coast Waste water treatment plant, another effluent. Next to the plant is the Crown Hill Graveyard, another island of history, surrounded by industry. The graveyard is sometimes closed due to illegal digging. Next to the wastewater plant too is the factory for the Pasadena Paper Company, making paper on the channel. Beyond it is another rare point of public access along the channel, a historic site next to the parking lot for the paper plant.

It was here—or near here, really—where Santa Ana, the president of Mexico, and the leader of the forces at war with Texas, was captured in 1836, the day after the nearby Battle of San Jacinto. He had fled the battleground disguised in a privates uniform, and apparently was not identified until he was brought back to the battleground by his captors, whereupon wounded Mexican soldiers recognized him and saluted him as “El Presidente.” This, according to the text engraved on a lonely granite monument, another island of history on the busy Ship Channel.



Santa Ana capture site and Pasadena Refinery coke dock.

CLUI photo

Across from the grassy shore at the monument is the concrete silo of the Houston Cement Company's East Plant, and behind that, less visible, the City of Houston's East Water Purification Plant, in Galena Park. As we travel downstream, we cross over the Washburn Tunnel, invisible beneath the sediments of the Ship Channel. The tunnel is for cars, and connects the two sides of the channel, emerging at roundabout on either sides. It opened in 1950, and with a 12 foot clearance, is too small for commercial traffic. Manned booths at either end of the tunnel watch the traffic come and go, making sure nothing too large slips by.

The Washburn Tunnel is another point of transition along the Ship Channel. Downstream the landscape opens up and intensifies, shifting scale even larger again. It is here where the port's tour boat, the Sam Houston, turns around, and heads back to the pavilion. We, however, continue on, towards the San Jacinto Battlegrounds. The major petrochemical plants are still ahead.

Washburn Tunnel to Outer Loop

From this point on, heading downstream, the Ship Channel's land uses are mostly petrochemical. We enter the core of the largest petrochemical complex in the USA. There are seven refineries along the Ship Channel, two of which we have already passed, and ten major petrochemical plants. Just beyond the battleground, where the Bayou transitions into the San Jacinto River, are another half dozen petrochemical plants, and the nation's largest refinery, Exxon Baytown. Add to this the refinery zone at Texas City, a few miles further down San Jacinto Bay, and the refining capacity of the area equals about 1/8 of the nation's refining capacity. Extend the area further, to include the upper half of the Gulf Coast of Texas, and the region refines a quarter of the nation's crude, and produces more than half of the nation's petrochemical base materials for plastics and chemicals.

The USA consumes 20 million barrels of oil per day. Of that it produces 8, and imports 12, and refines all. The nation has more refining capacity than any other. There are 150 refineries in USA (including the small ones, like one in Nevada's remote Railroad Valley that handles less than 2,000 barrels per day). 26 of them are in Texas, which has a total refining capacity of around 5 million barrels per day. Louisiana is next, with 16 refineries and a 3 million barrel per day capacity, followed by California with just over 2 million barrels per day capacity, slightly less than the 2,150,000 barrels per day capacity of the Houston Ship Channel. Only a handful of countries are capable of processing considerably more crude than the Ship Channel, among them Germany, Russia, and Japan (though several nations are in the ballpark, such as France, Brazil, and Canada). Saudi Arabia, with more oil than any other country by far, has only six refineries, processing 1,750,000 barrels per day.

DOWNSTREAM: A TOUR OF HOUSTON'S WATER AND OIL

As we pass over the submerged tunnel, we encounter the black coke piles from the Pasadena Refining Company refinery, a medium sized refinery in Pasadena. The Pasadena Refining System Inc. owns this 120,000 barrel per day capacity plant, which it recently purchased from the Crown Central Petroleum Company. It is operated by Astra Holding USA, which is itself a division of the Belgian company Transcor International, under a partnership with Petrobras, the Brazilian federal energy company. Petrochemicals are truly a global industry.

Next to the refinery is a major tank farm, Kinder Morgan Pasadena, one of a few in the area owned by the company. The terminal is part of this distribution hub for the entire Gulf Coast area, and is connected the area's plants via 21 inbound pipeline connections, and 20 outbound. The tanks on site can hold 22 million barrels of refined products.

Kinder Morgan is one of the largest "midstream" companies in the country, handling much of the movement and storage of bulk materials and commodities of the petrochemical and energy industry, especially oil, gas, coal, and coke. The company has more than 150 terminal facilities, including some of the largest tank farms, rail to tanker ports, and bulk material yards in the Houston and Gulf Coast area. It owns or operates 40,000 miles of gas and oil pipelines in the USA, and is the leader in CO₂ supply and distribution, a gas used in gas well stimulation. It is a privately held company, and was founded in 1997, when it took over some pipeline assets from Enron.

On the north bank of the channel is another tank farm, owned by a variety of companies. Williams Holdings/Targa Resources operates a gas tank farm here, as indicated by the spheroidal tanks which tend to be used for pressurized gasses. Magellan Midstream has a large tank farm and terminal here as well. We are floating through the core of the network of petrochemical flow, whose buried lines can only be imagined. Opposite the tank farm and terminal is an unusual plant with a large shed. This is a phosphate plant, making components for fertilizers. The company handles hundreds of thousands of tons of sulfuric acid and phosphoric acid a year, and generates a literal mountain of byproducts, stacked in mounds nearby. The phosphate rock for the plant comes by ship from Morocco, the major global source for phosphates. Built in World War II, the plant has been owned by Olin, and Mobil. Agrifos bought the plant from Mobil in 1998, and manages it today, with over 200 employees.

Behind the plant is a network of rectilinear mounds known as "gypstacks," which have grown over the decades of operation of the plant. Primarily composed of gypsum, the material is pumped in a slurry to ponds at the top of the piles, where the water evaporates, leaving the solids. The gypsum is tainted with enough acids and other materials that it is not marketable, so it just piles up. Handling and isolating these acidic piles is a task that is being addressed at the moment by a company called Envirocon. Envirocon is an environmental remediation company established by Dennis Washington, a Montana-based investor who seems to specialize in toxic and acidic sites (he bought the Berkeley Pit in Butte Montana from ARCO in 1985, an open pit mine which is slowly filling up with billions of gallons of toxic and acidic water, and is the source for the longest Superfund site in the nation). The gypstack in Pasadena, connected to Agrifos, is a well known landmark visible next to Highway 225.

On the north shore, across the channel from Agrifos, is the former steelyard for Armco, once one of the largest steel production sites in the South. The site has mostly been redeveloped as the Greensport Industrial Park, and the massive sheds that remain at the site are used by separate metalworking companies now, such as General Welding Works, Ameriforge, and the Woble and Curtis Kelly pipe mills. Gulfstream Marine operates the remaining steelworks loading shed, and much of the rest of the shoreline is used for storing and loading steel products like pipe and beams onto ships and barges. Part of that site is the former Todd Shipyard and the Brown and Root engineering site, where ships were made during World War II. It later became the principal shoreline engineering and shipyard for the company that became known as KBR, the engineering subsidiary of Halliburton. The sheds are now owned by other metal engineering companies, and the terminal areas are used for shipping engineered products and pipe. Vulcan Materials operates an aggregate depot at the site, as well.

On the south side of the channel here is a former chemical works and terminal now used by Green Earth Fuels Processing, while remediation plans are worked out. Downstream from that are the terminals for Chevron Phillips' Pasadena Plastics Complex, though the plant is only partially visible, a few hundred yards in from the shore. (We will visit it on the bus later.) Next to that is the Ethyl Corporation plant. This plant, one of two owned by the Ethyl company in the USA (the other is in Richmond, Virginia) makes fuel additives. The Ethyl Company was founded by General Motors and Standard Oil in 1923, to produce Tetra-ethyl lead, which was discovered to significantly reduce engine knock and improve mileage when added to gasoline. Leaded gasoline became the norm for decades, before the pollution it produced provoked legislation to ban it. A few companies still market Tetra-ethyl lead, including the Ethyl Corporation. It is owned by the NewMarket Corporation of Virginia.

In the 1990's, the Ethyl Corporation spun out two of its divisions as separate companies that still operate at this location: the MEMC Company makes granular polysilicon, for silicon wafers used in the computer industry; and the Albermarle Corporation, a specialty chemicals company that makes aluminum alkyls, and magnesium alkyls.

On the north bank, Greens Bayou flows into the Channel, around the bend that is the former Todd/KBR shipyard. A big black pile on the other side of the confluence of Greens Bayou is the Kinder Morgan petroleum coke terminal, a transshipment point for rail and ship. Nearby is a small pumping operation, operated by Ballard Exploration. This gas distillates well is the only "upstream" production site visible from the Bayou. Its all downstream.

On the south shore is a terminal and plant for the Georgia Gulf Company, a petrochemical company with 50 locations worldwide, specializing in chlorovinyls and aromatics—feedstocks for plastics and chemical industries, especially for building materials, such as vinyl siding. Georgia Gulf was formed out of the Georgia Pacific Corporation in 1985. This plant was built in 1979, and makes cumene, a synthesized form of benzene and propylene used in acetone and phenols. Next to that petrochemical plant owned by BASF, the German company that is usually ranked as the largest chemical company in the world, with nearly 100,000 employees. They have a few plants in the Gulf Coast, but this is the only one directly on the Ship Channel.

Beyond the Outer Loop

The soaring span of the Sam Houston Beltway Bridge marks the transition of the Bayou to the region outside the beltways that ring the city. At 1,500 feet, it is the longest concrete arch bridge in the country, taking traffic 140 feet above the waters of the Ship Channel. As the crow flies we are 13 miles from where we started, though about 15 miles on the water. This is the last stretch of Buffalo Bayou, and is completely developed by industrial land uses, primarily petrochemical.

On the north side of the channel, Beltway 8 slices through the former San Jacinto Ordnance Depot, established in World War II to inspect, repair, and store ammunition. The Captain of the port, at the time, thought it was bad idea to handle munitions in the heart of nation's petrochemical complex, but it happened anyways, and generally without incident. In October 1964 most of the depot was sold to the Houston Channel Industrial Corporation for somewhat more than ten million dollars to be developed into an industrial park. While portions of the depot have been developed, there are still large tracts of greenspace, where more than a hundred munition storage igloos remain in the overgrowth. Chemical weapons, such as phosphene and mustard gas bombs, were known to have been buried on site, and dumped at sea. Some munitions were dumped in the channel too, and have been left there to this day.

On the south shore, just after the bridge, Shell Deer Park begins. This is the largest petrochemical plant on the Bayou. The first site is the petroleum coke dock for the plant, operated by Kinder Morgan. Most refineries produce coke in some quantity. It is a product made at the bottom end of the refining process, from the thick gooey residue of petroleum that is left over after the rest has been turned into other things. Coke is generally made in vertical ovens, where it collects and dries, forming a solid block of black carbon. Once full, a battery of derricks on top of the coking towers drill into the solid mass, enabling it to be broken up, extracted, and moved by conveyor to piles near the shore, from where it is loaded onto barges and ships. Though some petroleum coke ("petcoke") is used in the refining process, most is used in other industries, such as steelmaking.

The coking towers at Shell are visible at the other end of the conveyor from the coke dock. Beyond them is the rest of the plant. At this, and other refineries, crude oil (aka petroleum) comes in via tanker and pipeline, and is held in storage tanks on site for up to a week or two, but usually much less. Refining is on one hand a very simple process which hasn't changed in a hundred years: crude is boiled and its vapor is collected and condensed into different fluids, such as gasoline, kerosene, fuel oil, and jet fuel, that forms at different pressures and temperatures.

Heated fluid enters the bottom of fractionating towers, where its vapors are collected at different levels, based on their density, temperature, and other characteristics, through a series of baffles and plates inside the tower. They are piped off through ports and pipes along the side of the tower for further treatment elsewhere, such as in reactor vessels, which apply pressure to make specific reactions occur. Catalyzer cracking units use crushed solids as catalyzers, generally chemicals and metals, to make other kinds of reactions occur, and other kinds of materials to form. Hydrocracking uses hydrogen. Along the way heat exchangers cool and heat the fluid as needed, and make steam for power too.

All of this and more occurs on Shell Deer Park's 1,500 acres. One of the largest petrochemical sites in the nation, the site combines a refinery and a major chem-

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ical plant, both owned by the oil company Royal Dutch Shell. The refinery has the capacity of processing 340,000 barrels of crude per day, making it among the top ten largest refineries in the nation. It is operated in partnership with Pemex, the federal Mexican oil company, as it processes a lot of oil from that country. Established in 1929, the refinery refines sour crude from Africa and Venezuela as well. The chemical plant was established in the 1940s and makes base materials for the chemical and plastics industries, including aromatics such as benzene, and xylene; olefins such as ethylene, propylene, butylene; phenols; and solvents. Most of the products are moved to other plants by pipeline, though the docks at Deer Park, on the Houston Ship Channel, handle enough material to rank it the 25th largest port in the nation.

Across the channel from Shell is a terminal and tank farm on the edge of the ordnance depot, operated by the Oil Tanking Company, and Stolthaven. Next to that, Texas Terminals Inc. operates a bulk and engineered materials shipping terminal, next to a large grain elevator, operated by Cargill, the Grain and Oilseed Supply Chain, Houston Export Terminal. Much of the area past Cargill was the site of another large World War II steel plant, Bethlehem Steel, now generally referred to as Jacintoport. Like Greensport, the steel site has been redeveloped for a wide array of industries, including steel engineering and fabrication, petrochemical storage, chemical production, and international shipping.

At a slip inside the port area of Jacintoport is Jacintoport International, a private cargo company, handling bagged and boxed commodities, with links to the Caribbean, and South America. As a private company, not part of the Port of Houston, it offers an alternative labor force, and an especially secure facility. It is owned by Seaboard Corporation of Kansas, which also owns pork processing companies, and grain processing companies. Other parts of Jacintoport include drilling mud producers; a Siemens company facility; Technip, an offshore oil technology engineering company; GE Energy; Precoat Metals; Powell Industries Offshore; Delta Engineering Corp.; and the Haltermann Custom Processing chemical plant. The largest single site is the Houston Fuel Oil Terminal, a tank farm exclusively used for crude and fuel oil. The facility has three tanker docks, and over sixty large tanks, cumulatively capable of storing more than 10 million barrels of oil. The tops are painted black, to absorb heat, reducing the viscosity of the heavy oils. (Normally tanks are white, to reflect heat, reducing evaporation of less viscous fluids, like gasoline.)

Across from Jacintoport, on the south side of the channel, three major petrochemical plants operate side by side. One is Oxyvinyls' Deer Park Plant, manufacturing polyvinyl chloride, polypropylene ether, polystyrene, polyester, polyurethane, and other poly plastics chemicals and resins. Oxyvinyls is part of Oxychem, which is based in Dallas and has 21 plants in the USA, six of them in Texas, mostly along the Gulf Coast and Ship Channel. Oxychem is a subsidiary of the Occidental Petroleum Corporation of Los Angeles.

Next to that is Rohm and Haas' Deer Park plant. This plant is the world's largest manufacturer of methacrylate and acrylic monomers, used to make latex paints, of the variety found in consumer hardware stores. The plant was built after World War II, by the Philadelphia-based chemical company, Rohm and Haas. Rohm and Haas specializes in acrylic chemistry, and is a leading producer of the source chemicals for paints, adhesives, and laminates. The company has dozens of plants around the country, including those of its subsidiary Morton Salt. This plant, and the company's adjacent Lone Star Plant, are among the largest of the company's holdings.

A narrow slit in the shore, Tuckers Bayou, divides Rohm and Haas from the Intercontinental Terminals site, a bulk liquid logistics yard and tank farm. The 265-acre site includes a rail yard with a 550-car capacity, 180 storage tanks, and several barge and ship docks. Owned and operated by a small local company, Intercontinental Terminals employs around 150 people, and is the largest refrigerated olefins handling facility in the country. It is next door to Vopak Deer Park, a similarly sized and functioning terminal site.

Carpenters Bayou winds through Jacintoport, and flows into Buffalo Bayou, near its mouth. At the end of Buffalo Bayou, where it enters the mixing bowl of the Old River and the San Jacinto River's stream, is a tugboat terminal and the channels where the chemical barges serving the Ship Channel are stored, serviced, and scattered about. We turn in to the south shore, towards the looming tower, and the ceremonial grounds of the San Jacinto Battlegrounds.

Landing

The Houston Party Boat passengers on the CLUI tour disembark at a rarely used ramp along the bulkhead behind a taco truck at the state historic site. The group is confronted first with the Battleship Texas, an ahead-of-its-time battleship on display at the site that looks more like an evil spacecraft from Star Wars than a World War I warship. It is the only surviving battleship to have fought in both world wars. But other than the fact that it is here, it has little to do with this place.

The San Jacinto Battleground State Historic Site is a park established to preserve and commemorate the 1836 battle that brought Texas its independence from Mexico, and which created the Republic. Its resemblance to the National Mall in Washington DC is hardly coincidental. A network of monuments, plaques, and engraved stones dot the park near the edge of the Bayou, eventually clustering in a symmetrical configuration that lines up with a long reflecting pool that converges at the vanishing point where the San Jacinto Monument rises up to the sky.

The group on the tour heads down to the Sundial, located in the waterfront core of these alignments, a sculpture that symbolically draws time and the cosmos into this commemorative matrix. With the bulkhead wall of the dissolving end of the Buffalo Bayou behind us, and the soaring monument ahead, we have arrived at the tour's fulcrum, poised between the sea and land, horizontal and vertical, liquid and solid. Three hours ago we traversed the forgotten swamp, and have now arrived at the monumental tower—nonsite to site.

David Pomeroy, a living historian in period costume, meets the group, and describes the vectors of the 18 minute battle of San Jacinto which occurred on this spot in 1836. The battle was the historical reactor that produced, as its outcome, the Republic of Texas, which remained an independent nation for nine years, before joining the United States, though it remains distinct, separate in many minds, as this park evokes in epic proportion.



David Pomeroy, a living historian, talking to the group after landing at the San Jacinto Battlegrounds. CLUI photo

It was on this spot where the soldiers from Texas's army camped, before heading across the prairie to attack the Mexicans, a mile to the east, just beyond where the Monument is now. Led by Mr. Pomeroy, musket in hand, we get on an awaiting tour bus and drive across the park to the Monument.

Despite being built to commemorate the founding of the very independent Republic of Texas, the tower was built as a WPA project, a federal program of a socialist nature. It was started in 1936, on the centennial of the battle, and completed three years later. It is the tallest column in the world, according to Guinness, 570 feet—15 feet higher than the Washington Monument because of the Texas star at the top. This also is not an accident.

The monument has a museum, theater, bookshop, and archive inside, and an elevator that takes us up, eight at a time, to the observation deck near the top. Below, the alignment of the opaque reflecting pool points to a remarkable view westward, up the Ship Channel, with downtown Houston, in the distance. We are at the apogee.

Back on the bus, we head a mile down the road to the Monument Inn, where lunch is waiting in a dining room overlooking the Lynchburg ferry crossing. The crossing is a narrow gap where all ships entering the Channel have to pass. The state ferry goes back and forth the few hundred feet of water, carrying cars for free across the gap, dodging the ships, and the heavy currents that stream through the gap—the entire flow of the Buffalo Bayou and San Jacinto River come through here. The ships loom in the window of the Inn, like the landscape is passing by.

Battleground Industrial District

After lunch we head south down Battleground Road, and begin our approach into the heart of the petrochemical area, from land. The first facility we encounter, less than a mile outside the park, is the Vopak Deer Park Terminal. The bus enters the gate, and a representative of the company, waiting for us at the guard house, signs us in and boards the bus to escort us through the facility.

DOWNSTREAM: A TOUR OF HOUSTON'S WATER AND OIL

Though it is said to be the largest specialty chemical terminal in the world, in many ways this is a typical, large petrochemical terminal, one of a dozen or so along the Ship Channel, handling the movement of products produced in the area. It is a logistics, blending, storage and transfer site for a variety of refined liquids coming and going. It is connected to plants by pipelines, and is serviced by rail, ship, and truck. It has over 100 storage tanks, and busy ship docks, where the entire facility converges in a network of pipeways and loading racks to connect to tanks in ship holds. This facility is owed by the Dutch company Vopak, which is one of the largest bulk liquid handling companies in the world, with 80 terminals in 32 nations. The terminal is adjacent to the locally owned and operated Intercontinental Terminals Company, which performs a similar function, with 170 tanks, and a large rail terminal. It is Kinder Morgan, though, that dominates the terminal industry in the Ship Channel area.

After looping through the facility, we drop off our briefcase on the way out, and continue heading south on Battleground Road. We pass a large white Vopak tank with a remarkable painting of a battle scene. This is part of a regional chemical storage tank mural program, a program that is being sponsored by the Economic Alliance of the Houston Port Region, a collection of the chambers of commerce of the various towns and cities of the petrochemical zone. The Alliance has established the San Jacinto Texas Historic District, and has a number of projects in mind to emphasize the historic layer of the region. The mural program is the first, and most dramatic.

Not your typical hand painted historical mural program that one finds in small cities and towns, this is a state of the art imaging process that is visualizing moments from the Battle of San Jacinto on highly visible chemical tanks over a few years. The images are arrestingly dramatic and vivid, combining a heroic painting style, a la *Washington Crossing the Delaware*, with an epic, cinematic composition and realism. This is due to the way in which they are made. For each image, Native Sons Productions, led by Gary Foreman, the artist hired to make the murals, used live actors who were costumed, positioned in a scene outdoors, directed, and photographed. The image was then electronically altered to give it a painting-like coloration and drama, then printed on plastic sheets that are then adhered to the tank, forming an image that is nearly 100 feet wide. Each mural is to depict a different aspect of the battle, leading chronologically from the furthest away, to the closest. The figures in each mural gesture inevitably towards the San Jacinto Monument. As many as 25 murals are planned. The one at Vopak was the second one to be made. The companies that own the tanks pay the costs of the installation, which is close to \$50,000 each.



Project Stars mural on a Vopak tank.

CLUI photo

Other programs for the Alliance District's *Project Stars*, as the historic revitalization plan is called, include building ceremonial gates at either end of Battleground Road (at highway 225 at the southern end, and at Interstate 10, a few miles north), to draw people into what the Alliance says will be "a museum without walls." This museological layer is a historical veneer, where the generative mythology of 1836 exists as an appliqué on top of the infrastructure of the largest petrochemical area in the land. Even the name of the main street through the zone, Battleground Road is being changed to the more affirming Independence Parkway.

But for the time being, we travel south on Battleground Road, and pass Texas Molecular, a hazardous waste company next door to Vopak. Texas Molecular specializes in deep well injection disposal, and incineration. It was formed in 2001, after the bankruptcy of its predecessor at this location, GNI. GNI was known for, among other things, disposing of 3.3 million gallons of leftover Vietnam-era napalm from California that no one else wanted, and which floated around rail tankers like an orphaned garbage barge, before coming here. The company typically disposes of petrochemical waste products, and napalm, after all, is just gasoline, benzene and styrene: materials that can call this region home, and womb. Cradle to Grave.

Across from Texas Molecular is the Oxyvinyls Battleground Plant, a chlorine and caustic soda plant, operated by the OxyChem chemical company, a major national chemical company that is based in Dallas, and is owned by the Occidental Petroleum Company of Los Angeles.

Next we pass Clean Harbors' location at 2027 Battleground, the Deer Park Hazardous Waste Disposal Facility. This is a hazardous waste incinerator, where ash from the incinerator is buried onsite. It accepts contaminated wastewater, paints, solvents, reactive chemical clean-up material, lab chemicals, oils, and things like that. It opened in 1971, but was taken over as part of the assets of the company Clean Harbors, which has grown into the largest hazardous waste disposal company in the country, from its origins in Braintree, Massachusetts, and its first job cleaning up Boston Harbor. This is one of three Clean Harbor facilities on Battleground Road.

On the east side of the road is a petrochemical research and technology center for the French petrochemical company Total. Total is one of the six "supermajor" oil companies, like Chevron, ExxonMobil, ConocoPhillips, BP, and Shell. Total has several plants in the Gulf Coast area, including the plant next door to their R&D site here, said to be the largest polypropylene facility in the world (though there are others around here that also make that claim). Total acquired the plant from ARCO in 1984, and it produces 2.4 billion pounds per year, for use in food packaging, tape, carpet yarn, small appliances, housewares, outdoor furniture, toys, and many, many other things.

The CLUI tour bus turns left at the Total Plant, onto Miller Cutoff Road. (We will resume the journey down Battleground later.) Across from Total on Miller Cutoff is a plastics company called Metton America, based in Houston, that makes liquid molding resin, for things like truck bodies. Then on the north side, the Oxyvinyl LaPorte VCM Plant, connected by large above ground pipelines to the company's Battleground Plant. This plant makes vinyl chloride monomer, the key chemical precursor to polyvinyl chloride more widely known as PVC, a common and inexpensive plastic material used in pipes, and thousands of industrial and consumer products. Vinyl chloride monomer is made by combining ethylene, which comes from refineries, and chlorine, which comes from salt brine.

We quickly pass the gate for Dow Chemical's LaPorte Plant, also known as Dow Houston Operations. The plant makes 395 million pounds of polyurathanes, fabricated products, and engineering plastics every year. Piles of blue "styrofoam" cubes are visible outside the plant. We then pass the gate to the SR Burton Power Plant, a local provider of electricity, and the Burton Terminal for the pipeline company TEPPCO. TEPPCO is one of the largest gas and oil pipeline companies in the nation, and has its origins in the acquisition of the Big Inch and Little Inch pipelines (24 and 20 inches, respectively), originally built by the government to get Texas crude to refineries in New Jersey in World War II, and sold off after the war.

Miller Cutoff Road turns south, and heads through the Lyondell LaPorte Complex, a chemical plant that covers 540 acres, and is bisected by Miller Cutoff Road. The complex consists of two plants, each with port access, operated by separate subsidiaries of Lyondell before Lyondell's acquisition by the Dutch chemical conglomerate Basell in 2007. On one side of the road what used to be Equistar Chemical produces base chemicals for the type of plastic used in milk crates and household chemical bottles. On the other side, what used to be Millennium Chemicals makes acetic acid (used in foods), and vinyl acetate, used in adhesives and paints.

Next we pass Mobley Industrial Services, a specialty contractor company, one of several companies of this type in the area that do physical work on the region's chemical plants.

The bus turns east on Strang Road, crossing over the TEPPCO pipeline, and passing a plant operated by the industrial gas company Linde. We see the water of Upper Jacinto Bay through the trees, then arrive at the gate of our next destination, DuPont LaPorte. Our escorts board the bus, and guide us through the plant, pointing out the nine production units at the sprawling plant, each designed to produce a particular petrochemical product. Three business units operate these production units: the acid unit, which makes things like hydrofluoric acid, which is used to make Teflon and refrigerants; the ag unit, that makes herbicides and insecticides; and the polymers unit, that makes packaging plastics.

Dupont LaPorte opened in 1956 to make chemicals for agricultural products and clothing. It is a major manufacturer of weed killers, formaldehydes, and other biocides and herbicides. It also has what is said to be the world's largest polyvinyl alcohol unit, making a chemical used in weaving polyester blends. Part of the plant, the EVOH unit, has been sold off to Noltex and Nippon Goshei, subsidiaries of the companies Mitsubishi and Nippon Synthetics, which

makes Soarnol, a plastic food packaging brand used in things like ketchup bottles. At the west end of the plant is a large waste pile—an angular mound of powdery white material, several acres in size. The pile is mostly calcium sulfide, a byproduct of the hydrofluoric acid unit.

We snake around slowly through the labyrinth of glistening silver pipes, tanks, boilers, vents, coolers, crackers, towers and evaporators, watching for low clearances and narrow corridors for the bus. The plant seems deserted, though it is fully operational. Occasionally we spot a maintenance person in a jumpsuit riding a bicycle. They are surprised to see us too.

The county road used to pass through the plant and out to the south, but that road is now part of the plant and the south gate is closed. We are on the eastern end of the petrochemical corridor, at the end of the Pasadena Freeway, highway 225, next to the Baytown Bridge, which soars over San Jacinto Bay, and takes Highway 146 past the ExxonMobil plant in Baytown, the largest refinery in the country. We won't head out there today. We are at the furthest point on our tour. We drop off our helpful, jump-suited DuPont briefers on the way out the gate, and head back out Strang Road, back towards Battleground Road.

On the way we pass a number of smaller operations, such as the sheds of Katoen Natie, a Belgian petrochemical logistics company that dries, dusts, and deodorizes plastics; an Air Products industrial gas plant; Gulbrandsen Technologies, a chemical handling, packaging, and shipping company; and Sunoco Chemicals LaPorte Plant, a propylene plant that closed after an explosion in 2003. When we intersect with Highway 225, we head north on Battleground Road, covering the southern end, the part that we missed by taking Miller Cutoff Road earlier.

At 500 Battleground Road is a Clean Harbors office and truck yard, followed by the Akzo Nobel Deer Park Plant, that makes HPMO: high purity metal organics, such as metal alkyls, used in plastics and pharmaceuticals. Akzo Nobel is a large Dutch chemical company, with 60,000 employees worldwide, making paints, coatings, specialty chemicals, and other things.

Across from Akzo, in front of the GEO Specialty Chemical company plant (formerly Grace), which makes naphthalene sulfonate products, used as a dispersant and surfactant, is one of three older interpretive plaques on Battleground Road that talk about the Battle. Next is a Solvay Chemical plant that along with a sister plant in Longview Washington, makes hydrogen peroxide and its derivatives. Next door to that is the Ineos Olefins and Polymers, Battleground Manufacturing Center, followed by another Clean Harbors facility at 1777 Battleground. Just after passing Miller Cutoff Road, we turn west, onto Tidal Road, heading back towards Houston, but with a few more stops to make along the way, as the petrochemical odyssey continues.

Tidal Road to Jefferson Road to the End of the Road

Even though it's a public road, parts of Tidal Road pass so close to the petrochemical plants that you feel like you are in them. After passing the gate of Intercontinental Terminals, and Valvoline, the road runs through the Rohm and Haas Deer Park and the Lone Star Plants, including views of fountain-like displays of aeration at company water treatment plants. Degussa's chemical coatings and lubricant additives plant, on the edge of Rohm and Haas' Lone Star Plant, was recently integrated into Evonik, a new name for an old company in the petrochemical landscape, based in Essen Germany, and employing 43,000 people around the world. The road passes a greenspace, that was once a golf course for OxyChem, now overgrown and occupied by cows. Then the gate for Oxyvinyls' Deer Park poly plastics plant.

The road heads south and passes through Lubrizol's Deer Park Plant, making specialty chemicals for its parent company based in Ohio. Next to it is another Ohio-based petrochemical company, Hexion Specialty Chemicals, making binders, adhesives, coatings, ink, and the largest supplier in world of thermosetting resins. The plant is on the edge of Shell's Deer Park Plant, the refinery and chemical production giant that is the largest single plant on the Ship Channel. We travel its length on the feeder road of Highway 225, passing a closed Shell gas station near the main gate that is said to have supplied customers with gas piped directly out of the refinery. Fresh gasoline.

Just before passing under Beltway 8, we pass Jones Road north, the access road to the Ship Channel locations of BASF's plant, the Kinder Morgan Deepwater terminal, Kinder Morgan Deer Park Rail Terminal, and the Houston Ammonia Terminal. Passing under the beltway bridge we pass a debris field for Hurricane Ike debris, mostly broken trees, spread out neatly in a field, then the access road north to the Georgia Gulf Chemical company plant. We pass by a small ExxonMobil pipeline tank farm, then pass Preston Road, northbound, which heads to Marathon's Pasadena Terminal, and tank farm, then a waste pit, and then the Ethyl Corporation Plant, on the Channel.

On the tour we take the last of these access roads to their dead-ends in the north, Jefferson Road. We pass a Shell Oil Products Pipeline facility and a small Kinder Morgan facility, then the big gypstack for Agrifos, the fertilizer plant we passed on the Channel. The mound is being remediated by building a lime plant to deal with the acidic runoff. We then approach the last stop on our tour, the ChevronPhillips Pasadena Plastics Complex.

Like other large petrochemical plants, the facility is a few hundred acres in size, and contains several different production units within its fenced perimeter. This plant, which is said to be the polyethylene plant in the country, focuses on polyethylene, polypropylene, and K-resin, all fundamental plastic base materials for plastic products. The finished product here is solid and not liquid, taking the form of white pellets or fluff, that can be heated and formed into plastic products by factories elsewhere.

The Pasadena Plastics Complex is one of a few major plants in the region that are owned by ChevronPhillips, a large petrochemical company based in the Woodlands, north of Houston. ChevronPhillips was created in 2000, by joining the chemical divisions of Chevron and Phillips (now ConocoPhillips). Though an independent company, ChevronPhillips is still co-owned by Chevron and ConocoPhillips. It owns 36 petrochemical plants around the world, including in Al Jubail, Saudi Arabia. In Texas, the company has plants in Cedar Bayou, Port Arthur, Borger, and here in Pasadena.

We meet Roy Watson, the plant manager, at the administration building, and we watch a safety video on the bus. Each of us is given a sheet of paper with questions—a test to make sure we retained some of the safety information in the video. As we had been warned, any children less than 15 years of age had to get off the bus. There were two, and their mother stayed with them. The signed release forms and tests were collected, and anyone who might not want to be there was given a last opportunity to get off the bus. Then we entered through the gates. We are entering a place that is rarely visited by outsiders, and we feel privileged, though a bit trepidacious.

Roy guides the driver through the gleaming machine, describing its components. The ground is a clean cement and asphalt pad, above which rises cathedrals of apparatus, boilers, condensers, reactors, towers, tanks. The neohexene plant, the polypropylene plant, the polyethylene plant. Pompidou Center without Pompidou in the center. Nobody in sight, though the plant was operating fully. Roy assures us that each unit is being monitored by a crew of at least three or five people, though computers basically run the plant. The control rooms are blast proof.

At the southwest corner, we pass the rebuilt Polyethylene Plant Number 5, which blew up in 1989, killing 24 people. Pieces of the plant were found six miles away, north of Interstate 10, on the other side of the Ship Channel. Windows were broken two miles away, south of Highway 225. Roy does not mention the explosion. We loop through the vacant landscape machine, as the machine churns out pure plastic pellets. We leave, awed.

We head south on Jefferson Road, back on 225 westbound. Pass the Celenese Chemical Plant, the Air Products plant, and loop around the traffic circle at the southern side of Washburn Tunnel to pass by the Pasadena Refinery, the Kinder Morgan Pasadena Terminal, and the site where Santa Ana was captured the day after the Battle of San Jacinto. The bus is too big to fit in the tunnel, so we head back to the 225, past the Lyondell Houston Refinery, and the Texas Petrochemicals Houston plant, one of the largest synthetic rubber plants in the nation. The plant, located adjacent to a Goodyear facility, was built during the rapid expansion of synthetic rubber production brought on by World War II, when the Japanese controlled much of the natural rubber areas in Asia. This federally supported wartime expansion of the petrochemical industry multiplied the infrastructure and R&D, and propelled the postwar diversification of synthetic fossil fuel derived compounds. The industry fed and was fed by the heightened consumerism and production of products after the war, a 1950s and '60s American renaissance of plastics, and cars, that continues today.

This plant, and another owned by the company in Port Neches, Texas, make Texas Petrochemicals one of the largest suppliers of butadiene in the country. Butadiene is a feedstock for synthetic rubber, and carpet nylon. The plant covers 256 acres and produces more than 1.5 billion pounds of product per year.

The bus flies over the Sidney Sherman Bridge, the inner loop spanning the Ship Channel. We pass Rhodia, the VW yard, and the dredge spoils mounds. Then land back at Allen's Landing, where it all began—in 1839, and in 2009. ♦

This tour was made possible by the Buffalo Bayou Partnership and the Mitchell Center for the Arts at the University of Houston.

FIELD TRIP THROUGH A STEELSCAPE

continued from page 12

The group outside the remains of the ACME coke plant.

CLUI photo

pointing out places like the former Republic Steel Plant site on the Calumet River, and the location where Joliet Jake threw the broken cigarette lighter out the window of the “Blues Mobile.” We stop at the ACME coke plant, a spectacular battery of furnaces and towers, and the last remaining bit of major steel related industry on the Illinois side of the Calumet region. For years, Sellars and his group were trying to preserve it as a museum and historic site. They were unsuccessful. It is being torn down in front of us.

After a lunch at a tamale/perogi stand on Indianapolis Boulevard, we hug the shore around the huge and stunning Indiana Harbor plant, and the huge and stunning BP refinery, then visit the unusual architecture of the old worker's town of Marktown. Afterwards to Valparaiso, where we meet Bob Allen, a pilot who has arranged to have two Cessnas available, to take the group, on two separate trips, up above the steelscape—really the only way to get a sense of the scale of the industry in the region. None of the students had been in a small plane before.

On the following day we looked at the third of the big three along Lake Michigan, the Burns Harbor Plant, then to the new Indiana Dunes Visitor Center and a brief film introduction to the dunes. This stretch of the sandy shore along the lake has been preserved, and represents what part of the hyper-industrialized coast might once have looked like. On Beverly Drive, along the beach, the row of Century of Progress homes, moved here from Chicago's Worlds Fair, continue their century of slow restoration.

We climb Mount Baldy, the tallest remaining dune in the park, the others having been removed long ago for construction material and landfill. From the top of the dune Lake Michigan looks like the ocean, wide and infinite, large waves breaking over a big sandy beach extending in either direction. To the west—the hazy distance of the largest remaining steel plants in the country. To the east—the looming cooling towers of the Michigan City power plant. We head east. ♦

Over the course of the semester, guided by their instructor, Julia Christensen, the students developed an exhibition about their brief but intense trip to the nation's steelscape. The exhibit opened November 21, 2008 in the Fisher Gallery at Oberlin College, and was called Diversify or Decay: The Rust Belt Buckles.

More on the exhibit, and documents from the trip, at this link:
<http://youwillneverfind.us/landarts/gary/main>

FIELD TRIP TO THE MEADOWLANDS

OVERLAND SWAMP TOUR IN NEW JERSEY



Students clean the snow off the new interpretive marker at Snake Hill, on the Hackensack River. CLUI photo

THE CLUI LED A FIELD TRIP of students from Philadelphia's Temple University into the Meadowlands of New Jersey one cold day last January. The trip was part of a workshop, called *The Philadelphia Experiment*, organized by Chris Taylor, who along with Bill Gilbert of the University of New Mexico, developed the field program *Land Arts of the American West*. It truly was, in a sense, an experiment, to apply some of the practices of site specific work developed in the west, to urban eastern landscapes.

The Meadowlands is a progenitive place of landscape art, the closest open landscape to Manhattan. As such, it was a place where notions of site/nonsite and “art tourism” of the sort established by 1960s and 1970s artists like Robert Smithson, Michael Heizer, and Nancy Holt, has its origins.

For the CLUI, this was also an opportunity to experiment with guiding groups through this untamed space. The Meadowlands is one of the most difficult places to travel in. It exists as layers of transience, through and over, with just a few established ways to stop and get involved. Transportation is funneled to specific places, but the interstitial is bypassed. That's what makes it so overlooked, and so compelling.

The trip began with the drive up from Philadelphia, despite the ominous looming of a heavy snowstorm forecast. The group, in two white vans, flew through the Meadowlands on the New Jersey Turnpike, getting a overview of where we would spend our day. At Exit 16W, at the north end of the Meadowlands, we disenturnpiked, and like a ball in a pinball machine, came out of the slot to begin our trip bouncing from pin to pin, site to site, slowly dropping down to the bottom, the southern end, game over.

At the exit, we looped around Giants Stadium and Continental Arena, massive edifices of spectacle—and the latest addition to this cluster, in a frozen sea of parking space, a still unfinished recreational mall with the nation's first indoor ski slope, an epic erection rising out of the paved swamp, called Xanadu.

Then Highway 3 to Hillside Cemetery, an open space at the top of the escarpment that runs along the west side of the Meadowlands, for an orientation briefing and overlook. The view from the cemetery reaches

across the foreground flats all the way to the skyscraper tips of Manhattan. The view from Robert Smithson's grave surpasses the view from Joey Ramone's.

From this point, we plunged down through office parks with businesses which make acrylic motivational trophies, and through dumping grounds for demolished debris, and head to a visitor center for another version of the Meadowlands. The visitor center is at the headquarters of the Meadowlands Commission, the agency that manages the redevelopment of the area. Here the Environment Center provides line-of-sight tubes, canted plaques, and walking trails on the edge of a restored marsh, next to landfill that is struggling to become a golf course. On the way out we stop in at the gift shop for stuffed bears and scientific toys.

From there we bounced around a variety of landings, landfills, and landmarks, including Laurel Hill, the Pulaski Skyway, the lonely and monumental Secaucus Transit Terminal, the Honeywell hazardous waste site, the Hudson Generating Station coal-fired power plant, and busy battered truck logistics yards. We eat lunch at a truck stop diner called The Truck Stop Diner.

On departure, we fly over Newark Bay on the Bayonne Bridge, which offers a view of the sinking wrecks at Mariner's Harbor, then we transect and circle Fresh Kills Landfill, the largest in the land, which becomes increasingly, then entirely, obscured in the coming snowstorm. Curtains closed, we drop back down the New Jersey Turnpike, through the fuzzy red glow of taillights and slush, to Philadelphia. ♦

The trip was part of the workshop Performing Land Arts: The Philadelphia Experiment, which itself was part of Field Reports: Documents and Strategies from Land Arts of the American West, a concurrent exhibit at Temple Gallery, in Philadelphia, January - February 2009, organized by Chris Taylor.

PERCEPTUAL RIFT

STUDENTS EXPERIENCE A CINEMATIC LANDSCAPE MOMENT

WHILE ON A REGIONAL ORIENTATION TOUR loop around the Great Salt Lake, a group of students from the Curatorial Practice Program at the California College of the Arts were subjected to conditions that led to a perceptual event that the CLUI identifies as a *Cinematic Landscape Moment*. This experience occurs when layers of perception are compounded to create a sensation of full fluidity between them, a sort of melting of modes into a singular experiential event that forms a momentary but profound sense of a new point of view. These events can be of startling and even transformative clarity and resonance.

The phenomena is similar to a *perceptual rift*, which the artist Vik Muniz has described as what occurs when two "seemingly contentious media," such as photography and drawing, are blended in such a way that the perceiver feels vision *itself*. In a Cinematic Landscape Moment (CLM) these media are the physical place—and the perceiver's moment in that place—and cinema. The rift that is created is actually a new space, opened up, a crack in our hardened, accustomed ways of seeing, into which the new experience flows.

This particular CLM incident, experienced by the curatorial students in Utah, occurred at a place called Lakeside, a remote place on the edge of the Great Salt Lake, where the end of the road meets the railway. Lakeside is where the Lucin Cutoff, a railroad causeway that divides the lake in two,

connects to the shore. A large rock quarry has consumed half a mountain here, digging out gravel ballast and fill for the railway roadbed. Across the lake from the Golden Spike, where the first transcontinental railroad was connected, it is a place made for and by the railroad, in the middle of the kind of *nowhere* that railroad spaces can be.

Present with the group was the filmmaker James Benning, who had with him a 16-millimeter print of his film *RR*. The group was on the way to Wendover, where we would watch the film that evening in the room above the airport firehouse. *RR* is film about railroads, and is made up of a few dozen shots of trains, entering and leaving the fixed camera frame, at different places all over the USA. One of those places is Lakeside.

After examining the point where the Lucin Cutoff causeway comes to the shore, it was suggested that the group break up and wander around independently for a while, each student on their own, without talking to each other. This is something Benning has done with his students at CalArts, as part of a class called *Looking and Listening*.

As the group's constituents dissipated into this landscape, following trails of their own inquiry, they could feel a personal experience and intimacy with the place grow in ways that their lives in a socialized urban environment does not usually permit. Like a walk in the park, but this was not a park, this was an iconic and dramatic western American place, not wilderness, but an engineered west, built by the railroad, the railroad that developed the West.

The story of the railroad's infusion and transformation of America is profoundly told in Leo Marx's seminal book, *The Machine in the Garden*. This book has had a great influence on many. Alternative cinema historian Scott MacDonald's book about landscape film, which includes a discussion about Benning's work, is called *Garden in the Machine*, an acknowledgement of the influence of Marx's work.

In referencing the book in this way, MacDonald seems to be suggesting that if the railroad was the machine that came into Edenic America, changing nature 100 years ago, then landscape cinema could be a contemporary antipodal analog, an interpretive machine, brought into this transformed and populated country, changing its appearance through the perceptual media of film.

With these things in mind, as people wandered, alone, along the tracks, a sense of change was felt, a low rumbling. In the distance, at first beyond the limits of sight, eastward down the Cutoff in the lake, a train seemed to be materializing in the haze. It took a while. People noticed the growing sound at different times. Eventually someone yelled "train!" to warn others away from the tracks. Then, all attention turned towards it taking minutes to come, each looking, fixed from their scattered points of view. Out of the inert quiet came anticipation, uncertainty, excitement, and even fear.

The sound escalated and the train grew inevitably then roared through us, blasting its horn, shaking the ground, ripping the space in half. You were on one side, or the other, of the thundering wall. The train filled the landscape, and all of our senses. There was no room to perceive or contemplate anything else. Even a scream could not be heard. The strip of cars and the flickering space of the gap between them were like movie frames on a widescreen cinemascope sensaround omnimax. Eyes darted, reading individual cars like shots, taking in the whole expanse like a scene.



Students at the Lucin Cutoff, waiting on a train with filmmaker James Benning.
CLUI photo

Then it passed, the clamour following it west, away from us, the sound diminishing, like a wake. The splatter of the film flapping its trailing edge from its spool, turning to a stop.

In that moment, the gamut of landscape and cinema was run. From the silence of the vast panorama, to the machine in the garden; from Lumier, Melies, Porter and the audience scared out of their seats by the first cinematic train, to the neo/post structuralist realism whatever of Benning's *RR*. A physicalization of film, and a resounding Cinematic Landscape Moment. ♦

GOIN WITH A TUFA CROWD TOUR CONCLUDES NEVADA LAND ART GATHERING

AN INTERESTING CONFERENCE WAS HELD IN Reno, October 2-4, 2008, at the Nevada Museum of Art. It was moderated and mostly organized by the writer William L. Fox. Due partly to the success of this program, the new Center for Art + Environment at the Museum was formally established a few months later, with Fox as Director.

Participants presenting their work at the conference included Lita Albuquerque, an earth artist who has made sculptures at the North Pole; Fritz Haeg, who talked about making lawns into gardens; Michael Light, aerial photographer extraordinaire; Geoff Manaugh, of *BLDG BLOG* fame; Crimson Rose, doyenne of fire, and original Burning Man woman; and Vito Acconci, who conducts many ingenious operations through his practice as an architect. After a few days of talk, much of this remarkable group mustered onto a bus for a trip to Pyramid Lake, led by Reno-based landscape photographer Peter Goin, with Ben Aleck and Ralph Burns representing the Paiute Tribe, whose lands we were headed to.

Heading north 50 miles from Reno, the bus lumbered for what seemed like hours, stopping once at the Tribe's information center in Nixon. From there the road turned to dirt, and then became a track as wide as the bus. We could see the destination in the distance, the big pyramidal rock, but the scale and severity of this landscape is wide and wild, with no reference points to judge scale, size, or distance. A kind of spatial disorientation settles in, and grows.

The lake and its shoreline is entirely inside the Pyramid Lake Paiute Reservation, so the land is controlled by the natives. Access is restricted to those who have obtained permits. Goin is a regular visitor here, and our native guides are part of the leadership of the Tribe.



The destination, the pyramid in Pyramid Lake, is the focal point, the magnetic node, that draws attention, myth, and possibly the first and last tour bus visit to it.
CLUI photo

Finally we arrive as close as a bus can get to the famous pointy rock jutting out of the water that gives the lake its name. We walk amongst the strange tufa formations, and run into a small film crew getting out of their silver jumpsuits and packing up their spaceship for the day.

Pyramid Lake is huge, and deep. It is the terminus for the Truckee River, which flows out of Lake Tahoe. The system is a basin, with no drainage to the sea: Tahoe on top, Pyramid at the bottom. Much of the river has been diverted, in one of the West's first major reclamation projects, the Newlands Reclamation Project of 1905, to irrigate farmland in the Lahontan Valley. As a result the lake level dropped, exposing the tufa, similar to what occurred at Mono Lake, in California.



Ben Aleck and Ralph Burns of the Paiute Tribe describe the myths of the pyramid at Pyramid Lake, Nevada.
CLUI photo

Near the shore, beneath the pyramid, Aleck and Burns talk about this place, and the myths that it engenders, or that engendered it. And how the tribe is considering cutting off access to this site entirely, as it has been vandalized and trashed at times, and is showing signs of wear.

Maybe that is the best future for this iconic Western American site, famous for photographs, but still only partially on tourism's radar. Despite the unnaturally exposed tufa, the site feels like it belongs to another version of the nation, one that was not allowed to be. Maybe it should stay that way. Unconquered. Returning, the bus goes up and down and up and down over the unengineered road in the fading light, a farflung cruise ship riding the waves of the sagebrush ocean. Aleck and Burns' voices over the PA, deep, and intermittent, telling tribal myths, and jokes, and combinations of the two, getting the last laughs, all the way back. ♦

TEXAS OIL *continued from page one*



A Brucker Survival Capsule was displayed outside the Blaffer Gallery, as part of the CLUI exhibit. The craft is used for emergency evacuations of offshore oil rigs. It is one of 1,100 of this style built by Whittaker Survival Systems between 1968 and 1982, many of which are still in use today. Typically the vessel hangs off the side of the platform, and is lowered by a mechanical winch in the event of a fire or an impending explosion. It is equipped with rations of food and water to support its capacity of 28 people for three days. The craft was supplied courtesy of Alexander/Ryan Marine Safety Company, Houston. CLUI photo

The Texas Oil exhibit's first incarnation, at the Blaffer Gallery of the University of Houston (on view from January to March, 2009) started outdoors, where passers-by on the campus couldn't fail to notice a large orange craft, looking like a flying saucer from another planet. The craft is, indeed, from another place – the parallel universe of oil production, an industry so sophisticated, remote, and evolved that it seems like science fiction.

The building next to the survival craft, the Blaffer Gallery, housed the exhibit. Inside, the show began with a video room, where a looped, wall-sized *landscan* was shown as a continuous loop. The *landscan* is an unedited, 14-minute shot of the ground, from a flight over the nation's largest petrochemical corridor, which begins just east of Houston. The image was procured using high definition video camera inside a gyro-stabilized ball mounted on the nose of a helicopter. The route was scouted and directed by members of the CLUI, and was shot by Ron Chapple, an aerial videographer. The scene is further enhanced by an other-worldly room tone created by Kevin Doherty, of the UK-based musical group Sleep Research Facility.

After sitting through the *landscan*, a kind of orientation and recompression room, visitors of the Houston exhibit then entered the Gallery of Companies, where 40 framed images of corporate offices lined the walls, like portraits of chairmen-of-the-boards in a company boardroom or lobby. The entities selected are the primary engineers of the Landscape of Oil. Though they operate globally, most are based in Houston.

The gallery shows these corporation's public face—the corporate headquarters building (or their primary administrative location) in Texas, accompanied by a descriptive text, written by the CLUI. They range from oil service companies, such as Baker Hughes, Schlumberger and Halliburton, to equipment supply and engineering companies like NOV, the Wood Group, and Lufkin. Also included are the two global supermajor oil companies based in Texas (ExxonMobil and ConocoPhillips), and other independent oil and exploration companies like Marathon, Apache, and Anadarko. Major offshore rig construction and drilling companies (like Diamond Offshore and McDermott), and global petrochemical companies

based in Texas (Lyondell, Oxychem, ChevronPhillips, Celanese, Huntsman) are also presented. All in all forty of the lead characters that have created the contemporary petrochemical landscape are portrayed. Collectively, this gallery describes the spectrum of the industry, from the diffused upstream sources of onshore and offshore oilfields, to the refining and petrochemical processing that occurs at the other end of the pipeline.

After this gallery, the exhibit continued down a hallway lined with maps. These maps, made for the industry by the PennWell/MAPSearch company, show the character, distribution, and extent of the infrastructure of oil and gas nationally, and how much of the national system is concentrated in Texas, and on the Gulf Coast, in particular. A big part of the oilscape is submerged in the Gulf of Mexico, where 4,000 oil and gas wells are linked by manifolds and pipelines on the ocean floor, connected to refineries on the coast, and ultimately to the Midwest and Northeast.

The maps show a crude oil pipeline network extending from California to New Jersey, and illustrate the density of the infrastructure in nodes around West Texas, Oklahoma, and Houston. The maps show the corridors connecting production areas, with the processing centers along the Gulf Coast, the busiest in the nation. Also apparent on the maps is the degree of interconnectedness between these processing centers themselves, especially around Houston, Port Arthur, and southern Louisiana, where in addition to crude, gas, and fuel, specific petrochemical feedstocks like propylene, ethylene, and butyrene, have their own dedicated pipelines between plants, and spanning the Gulf Coast.

The last and largest room in the Houston exhibit served as a portrait gallery of petrochemical places in Texas. Fifty six aerial images of fifty six sites, including the most productive and dense oil fields of the Permian Basin; the Federal government's petroleum reserves at Bryan Mound and Big Hill; the specialty chemical plants around Orange and Beaumont; offshore rig yards at Brownsville, Ingleside and Sabine; and the refineries spread across the state, from Port Arthur to El Paso.

In the course of the research and documentation for this exhibit, members of the CLUI visited just about every major petrochemical site in the state, both on the ground and by airplane. The CLUI has been working on this exhibit over the past year, as part of its efforts to focus on oil in the United States. The majority of photography took place in October - December, 2008. Images and text have been integrated into the Center's online Land Use Database. ♦



In the middle of the main gallery was 42 gallons of oil (in a clear plastic barrel), a physical representation of the unit of volume used as the basis for the global commodity of oil. The barrel was filled with used lubricating oil from the University of Houston motor pool, a substance administratively considered "academic waste." It is the residue at the end of the process of oil consumption. CLUI photo

SOME FACES FROM THE PORTRAIT GALLERY OF THE TEXAS OILSCAPE



Motiva Port Arthur

A large and historic refinery, the Port Arthur Refinery covers 3,600 acres (2,000 of it developed), and was established in 1903, as Texaco's first refinery, to process crude from the nearby fields around Spindletop. In 1998, the Saudi Refining Company entered a joint partnership with Texaco to operate the refinery, as a company called Motiva. After Texaco was purchased by Chevron, in 2001, the company's 50% share was sold to Shell. The refinery employs more than 900 people, and has a capacity of 275,000 barrels per day, producing gasoline, diesel, jet fuel, and a number of petrochemical base materials.



Dow Freeport

Dow Freeport, on the coast forty miles south of Houston, is the first and largest of the Dow plants in Texas. Also called Dow Texas Operations, Dow Freeport consists of three primary complexes in town, Plant A, Plant B, and Oyster Creek, connected to one another by road, rail, and pipelines, totalling over 5,000 acres and 1,900 buildings. On these sites are 75 production plants, making nearly half of the company's products sold in the USA, and about 21% of its global production. Dow first came to Freeport by opening a plant to extract magnesium from seawater, in 1940. A second plant was established during the war, a little further inland and away from U-boats, to increase magnesium production. Dow rivals DuPont as the nation's largest chemical company. Though headquartered in Michigan, most of the company's manufacturing plants are in Texas.



Mont Belvieu Storage Area

Mont Belvieu is the largest volatile hydrocarbon storage site in the country. Around 100 excavated cavities have been made inside the large salt dome that underlies the rise in the landscape that gives the town its name. Of these some are over 2,000 feet tall, with more capacity than a supertanker. Several companies operate the storage cavities and the pipelines connected to them, that flow to and from the refineries of the Gulf Coast, and to markets elsewhere in the country. Mont Belvieu is one of dozens of salt domes along the Gulf Coast, many of which have been developed as oil drilling sites, and as underground gas and petrochemical storage.



ExxonMobil Baytown Refinery

With a refining capacity of over 550,000 barrels per day, Exxon Baytown is the largest refinery in the United States. And with 2,400 acres of intensely industrialized land within its perimeter, this is one of the largest industrial sites in the world. In addition to the refinery, ExxonMobil Chemical operates two petrochemical plants on the site, making 13 billion pounds of chemicals a year for a variety of industries and products. The refinery opened in 1919, by the Humble Oil Company, which later became Exxon. The 2.5 mile wide plant employs over 4,000 people. ExxonMobil, often ranked as the most profitable and largest company in the world, is based in Irving, Texas, near Dallas.



Sheldon Road Pipe Yard

Several pipe and tube yards are located along Sheldon Road, on the north side of the Ship Channel. This yard is used by Vallourec and Mannesmann, a German/French company, that makes hot rolled steel pipes in Europe and in Youngstown, Ohio, for use in the oil and gas industry. Patterson Tubular Services also uses this yard, and operates a barge terminal nearby for shipping and receiving tube. Steel tube is used in large quantities by the industry, for pipelines, drilling, well casing, and other applications.



Lyondell Channelview

The Channelview Chemical Complex is a major petrochemical plant employing 1,800 people, and totaling 4,000 acres. It began operation in 1957, as Texas Butadiene and Chemical, and later became an Equistar plant, a company subsidiary of Houston-based Lyondell. Two olefin units on the north side make ethylene, propylene, butadiene and benzene. The south facility uses these feedstocks to make propylene oxide, styrene monomers, gas blending products, and other products that are used in goods such as clothing, food packaging, furnishings, and building materials.



Big Hill Strategic Petroleum Reserve

Big Hill is a federally-controlled underground petroleum storage site, one of four in the Strategic Petroleum Reserve program of the U.S. Government. Along with another site in Texas (the Bryan Mound site near Freeport), and two in Louisiana, these sites can hold over 700 million barrels of crude, equivalent to two months of domestic consumption. Intended as an emergency supply for the nation, releases from the reserve have been used to manipulate the market. Big Hill was made between 1987 and 1991, and is connected by a 25 mile long, 36 inch wide pipeline to a terminal in Nederland. Like the other sites, Big Hill is a naturally formed underground salt dome with excavated cavities used to hold the oil. Each of the 14 cavities at Big Hill is around 2,000 feet in height, 200 feet wide, and can hold 12 million barrels.



Flint Hills Corpus Christi

Flint Hills Resources operates this refinery on the western end of a large petrochemical corridor along the shore of Corpus Christi. The plant has a capacity of 300,000 barrels per day, from crude that is delivered by ship to the port. Refined products travel through pipelines, some owned by Flint Hills, to San Antonio, Austin, and Dallas. Flint Hills also operates a refinery in Pine Bend, Minnesota, and in North Pole, Alaska, as well as chemical plants in Marysville, Michigan; Peru and Joliet, Illinois; and in Port Arthur and Longview, Texas. The company is based in Wichita, Kansas, and was created out of the large industrial and energy conglomerate Koch Industries, in 2002.



ChevronPhillips Borger

ChevronPhillips, a chemical company based in the Woodlands, north of Houston, operates one of its largest facilities in small city of Borger, near the top of the Texas Panhandle. The plant, originally a Phillips Petroleum plant, makes specialty products for the company, including mining chemicals, drilling mud additives, polyphenylene sulfide, racing fuels, and specialty organosulfur compounds. ChevronPhillips is owned by Chevron and ConocoPhillips. The plant also has a refinery operated by ConocoPhillips subsidiaries and partners.

THE TRANS-ALASKA PIPELINE

continued from page one

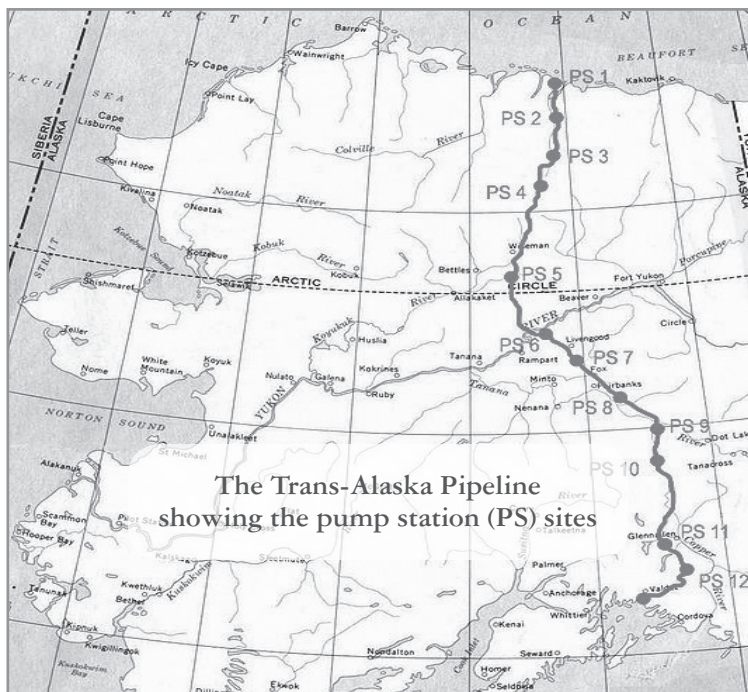
The Trans-Alaska Pipeline is a four-foot-wide, 800.32-mile-long pipe, built by 70,000 individuals in a little more than two years between 1975 and 1977, costing \$8 billion in private money. It is owned and operated by the Alyeska Pipeline Service Company, which is itself owned by the oil companies that dominate North Slope oil production: BP (47 percent), ConocoPhillips (28 percent), and ExxonMobil (20 percent). It spans the entire state of Alaska, from top to bottom, bringing the entirety of oil extracted from the North Slope at Prudhoe Bay—the largest oil field in the United States—to market.

The pipeline created overland access across the Last Frontier (you can now drive to the American Arctic, if you like) and brought billions of dollars to natives, Alaskan residents, construction workers, and, of course, the oil companies. From north to south it is a physical line of connectivity, transposing buried hydrocarbon fluid from the frozen north edge of the continent to the ice-free port at Valdez, from where it travels, eventually, to the suburban driveways of the West Coast.

In another dimension, looked at from the side, the line is a barrier, a physical form, a tube on a terrestrial scale. The pipeline is remarkable especially because it is visible. Most pipelines are underground, as this one was originally expected to be when it was first proposed in 1968. But after drilling over fifteen thousand test borings along the proposed pipeline route, it was determined that 420 miles of the line were in permafrost. That does not make a stable bed for a pipeline carrying hot oil (which enters the line at over 120°F). The solution, which was unprecedented, was to raise the pipeline above the ground, forcing much of the structure into plain sight. This created the iconic image in space and our minds of a pipeline spanning the American wilderness, and everything that represents.

What follows are some of the points of interest along the line, giving a sense of the pipeline and the CLUI exhibit about it.

A Journey Down the Pipe



The North Slope oil fields are spread out across a forty-mile-wide zone along the coast of the Arctic Ocean, between the largely untapped National Petroleum Reserve, to the west, and the Arctic National Wildlife Refuge, to the east. Six thousand people work in this zone, though nobody lives there. Most work two week shifts, twelve hours a day, sleeping in company “mancamps” where all meals are provided (all you can eat, at no charge), after which the workers are flown back to their hometowns, all over the United States, for two weeks off. The weather, of course, is terrible.

The hundreds of production wells and processing facilities on the slope are connected to one another by elevated pipelines. Wastewater and gas are injected into the ground, pumped away, or burned. The oil is processed at oil company facilities all over the Slope.



The purified petroleum converges on Pump Station 1, the beginning of the Trans-Alaska Pipeline, seen here emerging from underground on the edge of the pump station, and heading south. The Alaskan pipeline is the only way for the oil from the fields of the North Slope to get out, to market. The pipeline is what makes these fields viable.

The oil flows at around four miles per hour, taking about a week to travel from Pump 1 to Valdez. To move the oil, eleven pump stations were built along the route. Each is a self-contained small industrial town. Due to a decrease in the volume of oil shipped, and changes in efficiency on the pumps, only six of the pump stations are currently pumping. Oil flow peaked in 1988, when 744,107,855 barrels of oil moved through the pipe (at a rate that exceeded 2 million barrels per day). Now, with reduced production, around 710,000 barrels per day flow through the pipe, about 17% of United States crude oil production.

THE TRANS-ALASKA PIPELINE



The Haul Road, now called the Dalton Highway, follows the pipeline along its northern half. It was the first part of the pipeline to be built, in 1974, as it enabled materials and equipment to be moved north from the Yukon River, 358 miles from the top of the pipeline route in the oil fields of Prudhoe Bay. Originally, it was intended to be a private industrial road, as was promised in order to get Congressional approval to build the pipeline. It opened to the public in 1995, however, and is now Alaska State Highway 11, though still mostly unpaved.



The highest point on the pipeline is Atigun Pass in the Brooks Range. Here the pipeline runs underground for eight miles in an insulated concrete box that protects it from avalanche damage.



In addition to the commercial truck traffic, the haul road has around twenty thousand visitors every year and the state has erected turnouts, pit toilets, and overlooks along its path. Most of the tourists come on tour buses, operated by Princess and Holland cruise lines, as a side trip for cruise packages that otherwise focus on Alaska's southern coast. A popular stop for a group photo is the sign at the turnout where the haul road crosses the Arctic Circle.



Along this section of pipe, at the exact mid-point (Mile 400), on October 4, 2001, a hunter named Daniel Lewis shot the pipeline while on a drunken ATV trip with his brother. The hole produced by his .338 caliber rifle caused a jet of oil to spray 75 feet out, and almost 300,000 gallons of oil were spilled. The pipeline has been struck by bullets several times. Usually, the half-inch-thick steel just dents. Acts of sabotage have also occurred. The largest single spill from the pipeline was in February, 1978, when a bomb blast made a one-inch hole that resulted in 670,000 gallons being spilled. The people responsible were never identified. As a result of this incident, Alaska Senator Ted Stevens lobbied, successfully, to have destructive acts to the pipeline prosecuted as a federal offense.



The pipeline was designed to withstand earthquakes within a range of 5.5 to 8.5 on the Richter scale, varying according to estimated earthquake probability at points along its path. At the site believed to have the highest risk, where the pipeline crosses the Denali Fault zone, the pipe is on lowered risers that rest on elongated skids, allowing for up to 20 feet of lateral, and 5 feet of vertical movement. In November, 2002, a 7.9 quake occurred along the Denali Fault, its epicenter fifty miles west of the pipeline. The pipeline moved 7 feet laterally, and 2.5 feet vertically. Some of the support members of the pipeline were damaged, but no oil was spilled. The epicenter of the largest earthquake in American history, which happened in March 1964, was near Valdez, the pipeline's southern terminus, and measured 9.2 on the Richter scale.

THE TRANS-ALASKA PIPELINE



The Yukon River, which flows east to west, is a major aquatic artery for the interior of Alaska, and divides the state half. The half-mile-long bridge built for the pipeline and its haul road is the only road crossing of the river. The Arctic Ocean is 350 miles away, and the state north of the Yukon is virtually roadless, except for the Haul Road. The Yukon Bridge is the largest of the thirteen bridges on the pipeline. The pipeline makes more than 800 river and stream crossings, and it is buried under most of them, held down in a trench below the stream bed by large concrete anchors that straddle the pipe.



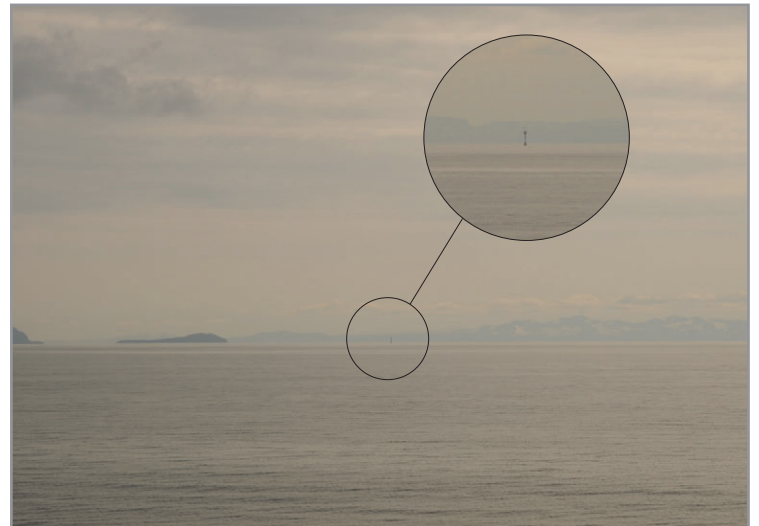
Where the line crosses roadways in permafrost zones, like at the Glenn Highway, a major road artery for the state, the pipeline goes underground. Here it is enclosed in material that is cooled by refrigerated pipes buried along side it. Pumping stations nearby keep the refrigerant circulating. In elevated sections, ammonia circulates from the base of the pipeline's buried feet (which sometimes extend more than 150 feet into the ground) to radiators that extend from its supports and remove heat from the metal parts. As the ammonia cools, it condenses and drops back down to draw the heat out again. This is a circulatory system unaided by pumps.



Thompson Pass, 776 miles downstream from Pump Station 1, is the crest of the last mountain range that the oil has to flow over. The south face of the pass is nearly vertical in places, which made this the most difficult part of the pipeline to construct. Welders and equipment had to be dangled by ropes to work on the slope. From this point, the pipeline remains buried for its final, home stretch, downhill, to Valdez.



The pipeline emerges from the ground for the last time and enters the East Manifold Metering Building at the Valdez Marine Terminal. From the metering building it goes either into storage tanks, or directly into tankers, parked at one of four berths. Nearly 20,000 thousand tankers have come and gone from Valdez since the pipeline opened in 1977, carrying more than 15 billion barrels of oil to refineries near Seattle, San Francisco, and Los Angeles.



The inlet of the Port of Valdez opens into Prince William Sound, and departing tankers entering the Sound keep a straight course southwest for twenty miles, then turn southeast once they get beyond Bligh Island and its adjacent reef. On March 24, 1989, the Exxon Valdez was piloted by the ship's third mate (the captain was sleeping off a few drinks he'd had at the Pipeline Club restaurant before leaving). The ship steered too far east, to avoid some icebergs, a common presence in that part of the Sound, and ran aground on Bligh Reef, spilling 250,000 barrels of oil into the ocean. Since then, a tower has been constructed, to make the top of the reef more visible. ♦

The CLUI exhibit was made possible by a grant from the Seed Fund, Studio for Urban Projects, and the CLUI Petro-America Program. The photoscape presentation includes 280 images. Audio used for the exhibit was a recording called Dark Waves, by John Luther Adams, a composer based in Fairbanks, Alaska. The exhibit is available as a quicktime program in the CLUI shop.

BOOK REVIEWS

BOOKS NEW TO THE SHELVES OF THE CLUI LIBRARY

Traffic: Why We Drive the Way We Do (and What It Says About Us), by Tom Vanderbilt, Knopf, 2008

A helpful explanation of many of the things we encounter each day that we drive, as well as a sympathetic look at the sociology of driving. It seems, for example, that the late merge (using the empty lane to get as close as you can to the merge point at a construction site lane closure) actually *is* more efficient for the group. Now if only there was a way to convey that, to all the self-sacrificing and indignant drivers you pass by on the way to the head of the line. We recommend the unabridged audio book version, so you can listen to nine hours of this while on the road.

Trash, edited by John Knechtel, MIT Press, 2007

A great little book about a big subject. Part of MIT Press' Alphabet City series of books that are sort of like the thematic, well edited and omnivorous Cabinet Magazine, but published in consistently small hardcover book form, and from more of a design/landscape/development perspective. Other subjects in the annual series are *Food*, *Suspect*, *Fuel*, *Water*, and *Air*, the latter two forthcoming. Makes you wonder if size *does* matter.

Brown Acres: An Intimate History of the Los Angeles Sewers, by Anna Sklar, Angel City Press, 2008

Finally, a book about Los Angeles' sewers—and with photographs.

An American Index of the Hidden and Unfamiliar, by Taryn Simon, Steidl, 2007

The hardbound catalog of Taryn Simon's photographic project exhibited at the Whitney in 2007. A treasure chest of negotiated access, the photographs (taken with permission and a 4x5 film camera) are ingots of the American condition, as she sees it—a photographic cabinet of curiosities from across the land. The collection itself is perhaps the real curiosity.

Detroit City Map, by Kati Rubinyi, 2008

Over 200 continuous black and white photographs, taken in 1991 by Kati Rubinyi of a cross section through downtown Detroit. The photos are sequenced according to the fold-lines of a road map, with typed phrases from newspaper accounts of the race riots of the 1920s, 1940s and 1960s.

Over: The American Landscape at the Tipping Point, by Alex S. MacLean, Abrams, 2008

More of Alex MacLean's aerial photographs. Fun to look at as usual—MacLean is one of the most prodigious aerial photographers of the built landscape out there. Despite a heavy environmental argument, expressed in the captions, the chapter headings, and the introduction by Bill McKibben, the book has a refreshing ambiguity, between the lines.

Blank Spots on the Map: The Dark Geography of the Pentagon's Secret World, by Trevor Paglen, Dutton, 2009

Paglen's ongoing gonzo-geographic odyssey through the black budgets and dark worlds of the tools and spaces of secrecy, espionage, surveillance, and power, fully flowers into political bloom in this book of his research and interviews. The conspiracy is that there is no conspiracy.

Energy Metropolis: An Environmental History of Houston and the Gulf Coast, edited by Martin Melosi and Joseph Pratt, University of Pittsburgh Press, 2007

A good start on a subject that is remarkably underexamined. This volume is broad in its subject matter, covering subjects such as air pollution, freeway construction, suburbanization, air conditioning. But only two of the twelve essays focus on the oil industry, the superlative and principal industrial feature of the region. An inventory of waste processes and issues for petrochemical production remains forthcoming, oddly.

How the States Got Their Shape, by Mark Stein, Smithsonian Books, 2008

A wonderfully literal and basic explanation of the morphology of America. The author (normally a playwright and screenwriter - he wrote the Steve Martin/Goldie Hawn comedy *Housesitter*) conveys the subject with the same exploratory surprise and sense of discovery as the reader experiences reading about it. Another good argument for why experts shouldn't always be the ones writing books.

Deep Challenge: The True Epic Story of our Quest for Energy Beneath the Sea, by Clyde Bursleson, Gulf Publishing Company, 1999

A good historical overview of the subject from the point of view of an industry insider. Who else would you trust to know about this?

Westward: The Course of Empire, by Mark Ruwedel, Yale University Art Gallery, 2008

Catalog of the exhibit of Ruwedel's black and white photographs of places in the west where the railroad used to be. Resonates conceptually with the history of western landscape photography, romanticism, and the end of the 20th century.

Trees Hit By Cars, by Adam Frelin, published by Adam Frelin, 2007

Photographs of trees with scars created from the impact of cars. Helps to know that's its from the POV of a conceptualist sculptor.

The Pablo Helguera Manual of Contemporary Art Style, by Pablo Helguera, George Pinto Books, 2007

Entertaining cynical reflection of the contemporary art world, done in the style of a style guide, from a "failed artist" who clearly has been around the block, and back, a few times. He works for MoMA, last we heard.

Public Phenomena, by Temporary Services, Half Letter Press, 2008

A renegade book of photographs depicting ephemeral structures, incidental patterns, improvised solutions, and other observations in urban space, mostly found along sidewalks in the cities of the world.

BOOK REVIEWS

RECENT BOOKS RELATED TO CLUI PROGRAMMING,
IN ONE WAY OR ANOTHER

On the Banks of Bayou City: The Center for Land Use Interpretation in Houston, edited by Rachel L. Hooper, Nancy L. Zastudil. Blaffer Gallery, the Art Museum of the University of Houston, 2009

The book published about the Center's time in Houston, leading up to the Texas Oil exhibit. Many interviews, a photographic essay on land use in Houston, a panoramic, foldout section, and a comprehensive chronology of the CLUI's projects and publications over the past 14 years.

Aeriality: The World from Above by William L. Fox, Counterpoint, 2009

Another timely subject—aerial viewing—by Bill Fox, now the Director of the Center for Art + Environment at the Nevada Museum of Art. The book is all over the place, covering the ground from Walter De Maria and Michael Heizer's pilot to current aerial art photographers like David Maisel and Michael Light. Fox discusses CLUI projects in Wendover and the Hudson River.

Big Box Reuse, by Julia Christensen, MIT Press, 2008

Christensen's selection of stories from across the country creates a portrait of a contemporary America at apogee, and of people making what they can with what they have been left with, as the tidal wave of consumerism washes through their town. Appropriately too, this book is outside the box, and not from any definite place, like urban studies, architecture, or social scholarship. Christensen approaches the issue freshly and directly, on a personal level, like the communities and projects she describes. The book is an inspiring product of someone astounded by the variety and richness of the extra-ordinary American landscape, and who takes us on a journey, trying to figure it out. At least that is what the Center's director Matthew Coolidge says on the back cover.

Experimental Geography: Radical Approaches to Landscape, Cartography, and Urbanism, Independent Curators International, 2008

The catalog to Experimental Geography, an exhibit which is travelling around to various venues around the country through 2010, looks at all. The CLUI contributed a series of posters of past projects to this group exhibit of work that deals with human interaction with the land.

Grand Tour, Perspecta 41, MIT Press, 2008

The concept of the classic European "Grand Tour" is still a lively one, and nowadays it can be applied to other less traditional destinations. The CLUI contributed *A Tour of the Monuments of the Great American Void*, a circumnavigation of the Great Salt Lake Desert, to this collection of writings on the Grand Tour put together by the Yale Architectural Journal.

Hydromancy, by Simparch with Steve Rowell, University of Texas at El Paso, 2007

Catalog to the 2007 project *Hydromancy*—in which Rio Grande river was distilled, through a natural process, to become potable. Simparch is a build/design team that has worked with the CLUI in a number of locations, and Steve Rowell is a CLUI associate.

The Infrastructural City: Networked Ecologies in Los Angeles, edited by Kazys Varnelis, Actar, 2008

The CLUI looked at gravel pits in this essential book about Los Angeles, examining the city of Irwindale, source of aggregate for much of the built landscape of Los Angeles, and a place so full of holes that more of the land in the city is a pit than not. Also included in this book is a section on traffic by CLUI associate Steve Rowell, as well as Lane Barden's spectacular aerial photographs of the city, and much more, about oil, water, telecommunications, and other infrastructure.

International Airport Montello, by e-team, Art in General New Commissions Program, 2008

The project International Airport Montello, by the artist group e-team, involved the purchase of land in a remote area of Nevada, near West Wendover, and the attempt to revive an abandoned airstrip, with the enthusiastic participation of the citizens of the nearby town of Montello. e-team, based in New York, were CLUI Wendover residents in 2004.

Land Arts of the American West, by Chris Taylor and Bill Gilbert, University of Texas Press, 2009

The Land Arts of the American West program, run by Chris Taylor and Bill Gilbert, annually takes a group of art and design students into the landscape of the Southwest for an intensive 50-day expedition. This book is a thorough and colorful overview of the wide expanse they cover, and of their creative interpretations of the places they visit and make work in, which include Spiral Jetty, Chaco Canyon, Roden Crater, Marfa, and CLUI Wendover.

The Urban Homestead: Your Guide to Self-sufficient Living in the Heart of the City, by Erik Knutzen and Kelly Coyne, Process, 2008

CLUI operative Erik Knutzen is a co-author, with Kelly Coyne, of this practical handbook of urban self-sustainability and green living. A comprehensive guide, with step-by-step projects explaining how to grow food on a patio or balcony, how to preserve food, cook with solar energy, how to divert your grey water to your garden, and how to have fun with your backyard chickens.

Wendover, No(s) Limit(e)s, by Jean-Michel Pancin, Monografik Editions, 2008

Jean-Michel Pancin, a photographer from Switzerland, was a CLUI Wendover Resident in 2005. For his project, he interacted with residents of Wendover, to discover how they envision their environment, and he photographed participants in their home or place of work, as well as the areas in Wendover they found most meaningful. The result is this honest and beautiful book.

World's Away: New Suburban Landscapes, by Walker Art Center, 2008

A catalog of the exhibit that originated at the Walker Art Center, then went to the Carnegie Museum of Art, and the Yale School of Architecture. The CLUI contributed a series of aerial photographs titled *Autotechnogeoglyphics: Vehicular Test Tracks in America*, a series that was completed as a commission for this exhibition.

Badlands: New Horizons in Landscape, edited by Denise Markonish, MIT Press, 2008

The catalog of an exhibit up at Mass MoCA, from May 2008 - April 2009. The CLUI selected a series of images and text of places in Massachusetts to include in the exhibit, creating a sub-exhibit entitled *Water and Power: 30 Sites in Massachusetts from the Center for Land Use Interpretation Database and Photographic Archive*. And oh yeah, the rest of the show was interesting, too.

Aspects of Mel's Hole: Artists Respond to a Paranormal Land Event Occurring in Radiospace, edited by Doug Harvey, Grand Central Art Center, 2008

Catalog of the exhibit sort of about Mel's Hole, a notorious alleged hole of unknown but possibly infinite depth in eastern Washington State. The area was one of several places left blank by Microsoft's Terra Server maps, the web-based satellite and aerial photo mapping system that was developed before Google Maps, and was talked up a lot on Art Bell's radio show, becoming a well known thing for people who are into such things, such as Doug Harvey, the art critic for the *L.A. Weekly*, who made a show about it. The CLUI loaned its sample of dirt that was allegedly collected during the excavation of Mel's Hole. The dirt was mysteriously lost in shipment back to the CLUI after the exhibit. ♦

UNUSUAL REAL ESTATE LISTING #23976 OLD MAN ALASKA GIFT SHOP



This gift shop and residence, located on the Alaska Pipeline haul road, is for sale. One of the few private structures built in such close proximity to the pipe, the gift shop and residence constitutes the entirety of the community of Old Man, Alaska, population, currently, zero. It is located at mile number 306, and is 70 miles from the nearest settlement.

Listing Agent: Cynthia Walker, Century 21. Phone (907) 322-5170.

Asking Price: \$250,000. ♦

THANKS TO OUR FUNDERS

Thanks to the following organizations for supporting the Center over the past year:

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University of Houston Blaffer Gallery

Buffalo Bayou Partnership

The CLUI wishes especially to thank Lauren Bon and the Annenberg Foundation for a two-year grant directed to support general operating expenses, including staffing and programming.

And last but not least, we very much appreciate the donations sent by individuals all over the country, who for years have been following our activities and sometimes impatiently inquiring for our next bulletin.

CLUI CORPS

Matthew Coolidge, Sarah Simons, Erik Knutzen, Ben Loescher, Steve Rowell, Philip Weil, Joe Potts, Steve Badgett, John Brinton Hogan, Jim Clark, Mark Curtin, Jed Lackritz, Lori Matsumoto, Ryan McKinley, Marina McDougall, Rob Ray, Jesse Stiles, Deborah Stratman, Julia Taylor, Igor Vamos, Bree Edwards, Andrea Grover, Matt Lynch.

Newsletter Editors: Matthew Coolidge, Sarah Simons.

Dedicated to the increase
and diffusion of knowledge
about how the nation's
lands are apportioned,
utilized, and perceived.

The Lay of the Land

The Center for Land Use Interpretation



SPRING 2009

on the horizon

Welcome to this latest edition of the *Lay of the Land*, and by latest we also mean *latest*. But at least it's a big issue! One reason we are so late on this one is because we have been immersed in oil. For several reasons, including the fact that this, 2009, is the sesquicentennial of the oil industry, by some measures, we have been engaged in several activities related to the subject, including some public events in Houston, discussed here. And we're not done yet: look for a show about Los Angeles' oil coming up in October. Elsewhere, we have a few events coming up this summer in New Mexico, including a public bus tour, led by the CLUI, on June 27, occurring around the time the show *Experimental Geography* comes to the Albuquerque Museum (June 28 - September 20, 2009). The CLUI will be operating an interpretive facility, opening August 1, somewhere out there in that most romantic and high tech landscape—the land of enchantment (see <http://www.landartnm.org/tours.html> for information about these events). Also on the horizon is an exhibit about Los Angeles' notorious Department of Water and Power, the largest municipal utility in the land. Those of you who have donated to the CLUI in the past two years will keep being the first to know about upcoming events, and those that have donated within the last year will receive the next newsletter too. Those that donate in the future will be rewarded with future newsletters, and the additional reward of knowing that they helped keep CLUI programming on the vanguard—even if we are a little late in talking about it. And, as always, thanks for *being there*!

- *Lay of the Land* Editors

SUPPORT THE CENTER!

- \$25 ☐ Receive a subscription to the Center's newsletter, *The Lay of the Land*, and be on our print mailing list to receive notices and invitations to CLUI tours, events, exhibits, and lectures.
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- \$1,000+ ☐ All the gifts above + your name on a plaque at the Center's main office in Los Angeles.



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Founded in 1994, the Center for Land Use Interpretation is dedicated to the increase and diffusion of information about how the nation's lands are apportioned, utilized, and perceived.

You may use a check or credit card, or donate to the Center online, at www.clui.org.

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