

PROVING OUR
METTLE



Baldwin Hills Community Standards District Annual Community Meeting

November 2016

A member of

ICMM

International Council
on Mining & Metals

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Corporate Profile FM O&G



 Oil
 Natural Gas



AGENDA

- FMOG CA Onshore Asset Sale
- FMOG Operation Overview
- IW Landscaping Status
- Natural Gas Storage
- IW Gas Production vs. Natural Gas Storage
- Community Involvement

Community Meeting
Presentation



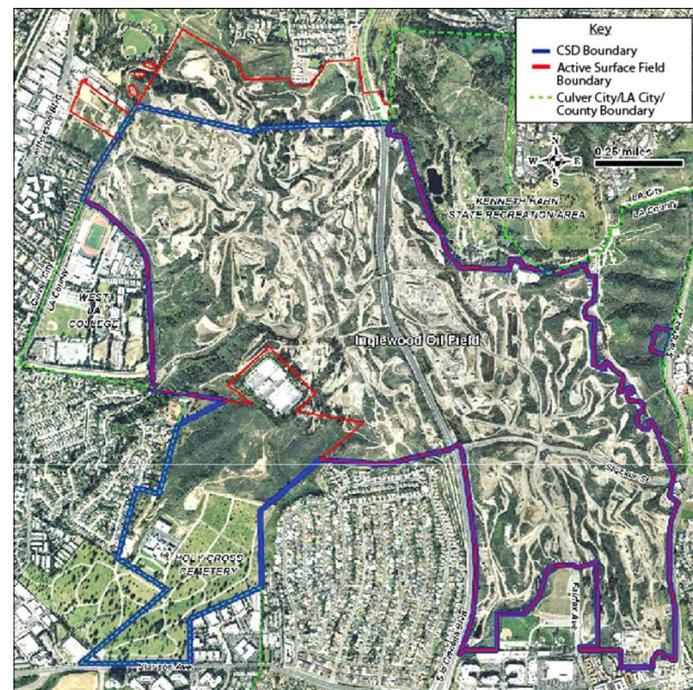
Overview of Sale to Sentinel Peak Resources

- On Friday (10/21) Freeport-McMoRan, Inc. announced it had reached a deal with Sentinel Peak Resources (SPR) to sell all of the company's CA onshore assets, including all of the LA Basin assets for up to \$742 Million
- SPR is a Denver, CO based company focused on the acquisition and development of onshore oil opportunities, with an emphasis on heavy oil production and thermal enhanced oil recovery in California
- SPR's management team has extensive experience in urban oil fields, for more information visit www.sentinelpeakresources.com



The Baldwin Hills Community Standards District

- 2016 marks the eighth year of our continued compliance with the Community Standards District (CSD)
- The CSD established new development standards for the oil and gas production operations by implementing stringent regulations, safeguards and controls for drilling activities





2015 and 2016 Operational Overview

- The following summarizes notable operational activities Freeport-McMoRan Oil & Gas (FM O&G) conducted during 2015 & 2016:
 - 214 well workovers (including reworking of wells) were performed in 2015 and thus far 123 well workovers were performed in 2016
 - The 2016 approved drilling plan identified 53 wells, 52 new wells, and 1 re-drill
 - 14 wells were plugged and abandoned thus far in 2016
 - No new wells have been drilled in 2016



2015 and 2016 Operational Overview

- In 2015, the Inglewood Oil Field produced approximately 2,377,000 barrels of oil and 1.1 billion cubic feet of natural gas
- Year-to-date (through September) 2016, the Inglewood Oil Field produced approximately 1,581,769 barrels of oil and 710 million cubic feet of natural gas
- FM O&G paid more than \$12 million in taxes to Los Angeles County in 2015 and as of June 2016 more than \$5 million have been paid to Los Angeles County





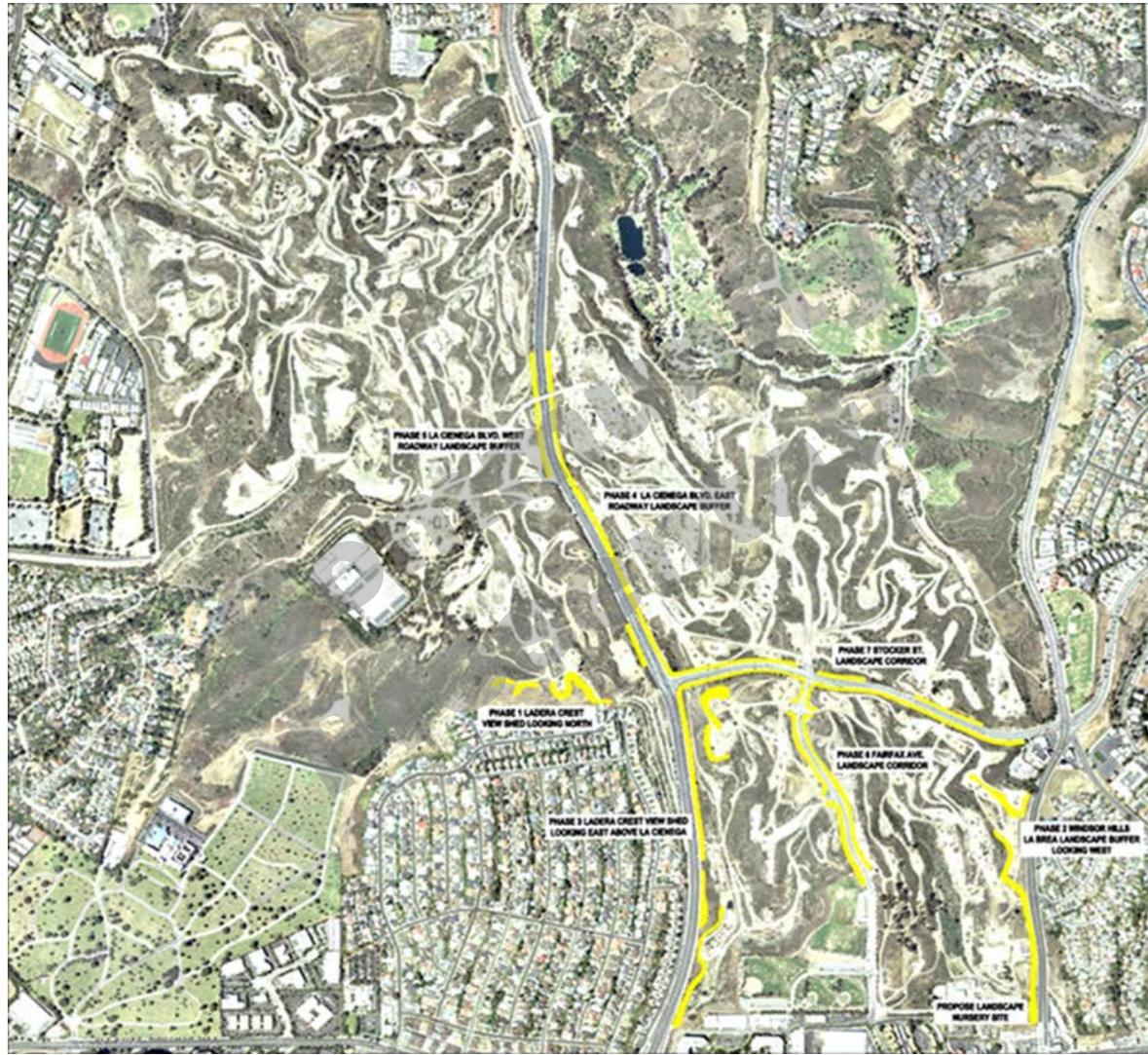
2017 Operational Forecast

- FM O&G has submitted a draft drilling plan proposing drilling and re-drilling 53 wells using 2 drilling rigs
 - The 53 wells are comprised of 34 producers and 19 injections, of which 1 injector is a re-drill
 - Depths range from 1,000 Ft. (Investment) – 6,000 ft. (Moynier)
 - There are no new drilling pads proposed for construction in the 2017 Drilling Plan
 - Currently 22 wells are identified for plugging and abandonment consideration in 2017
- SPR reserves the right to submit an amendment to the County



FM O&G Landscaping Overview

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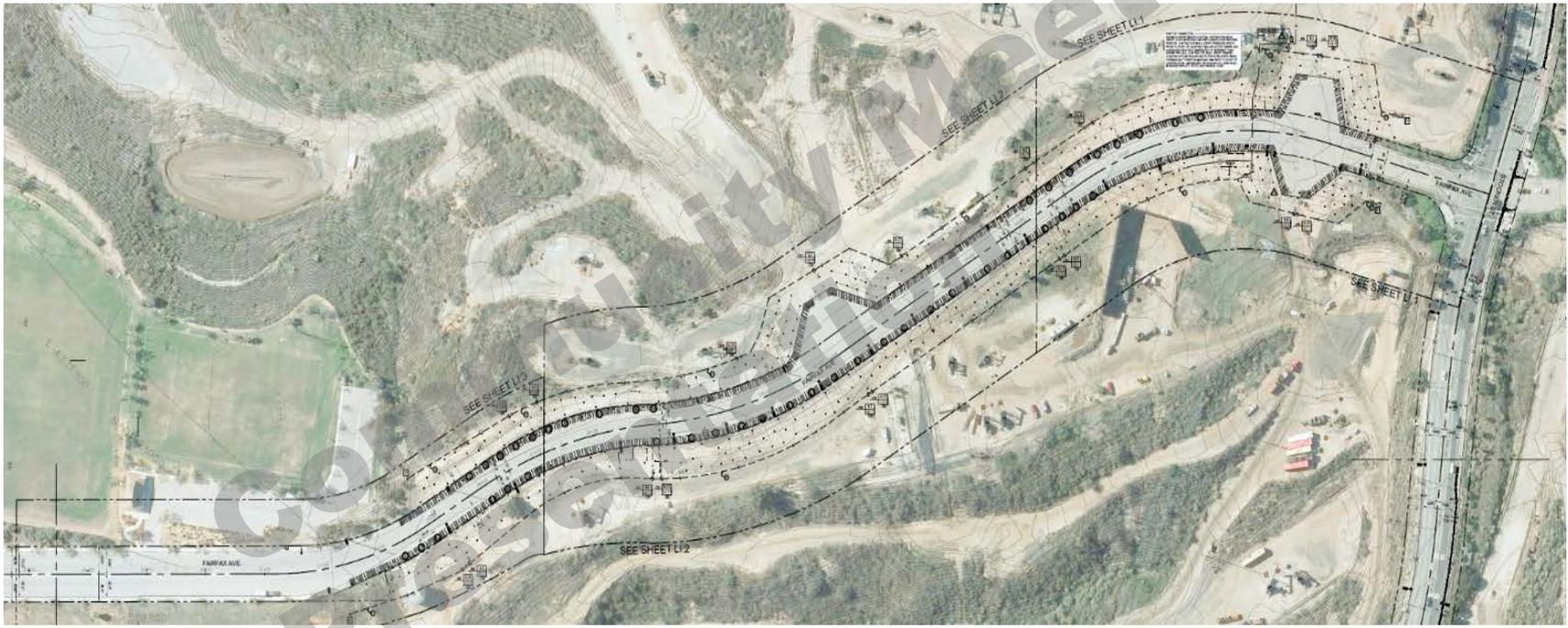


FM O&G Landscaping Phase 4





Landscaping Plan Update Phase 6



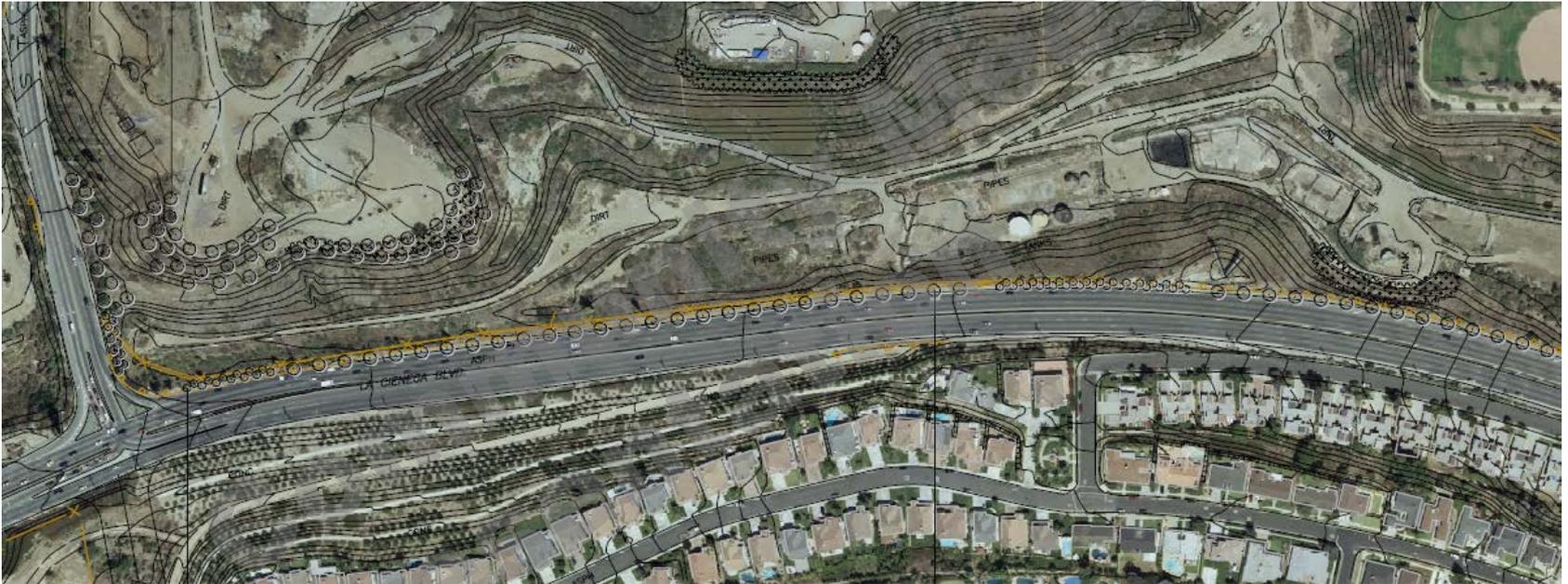


Landscaping Plan Update Phase 7





Landscaping Plan Update Phase 3



Pre
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What is a Natural Gas Storage Well?

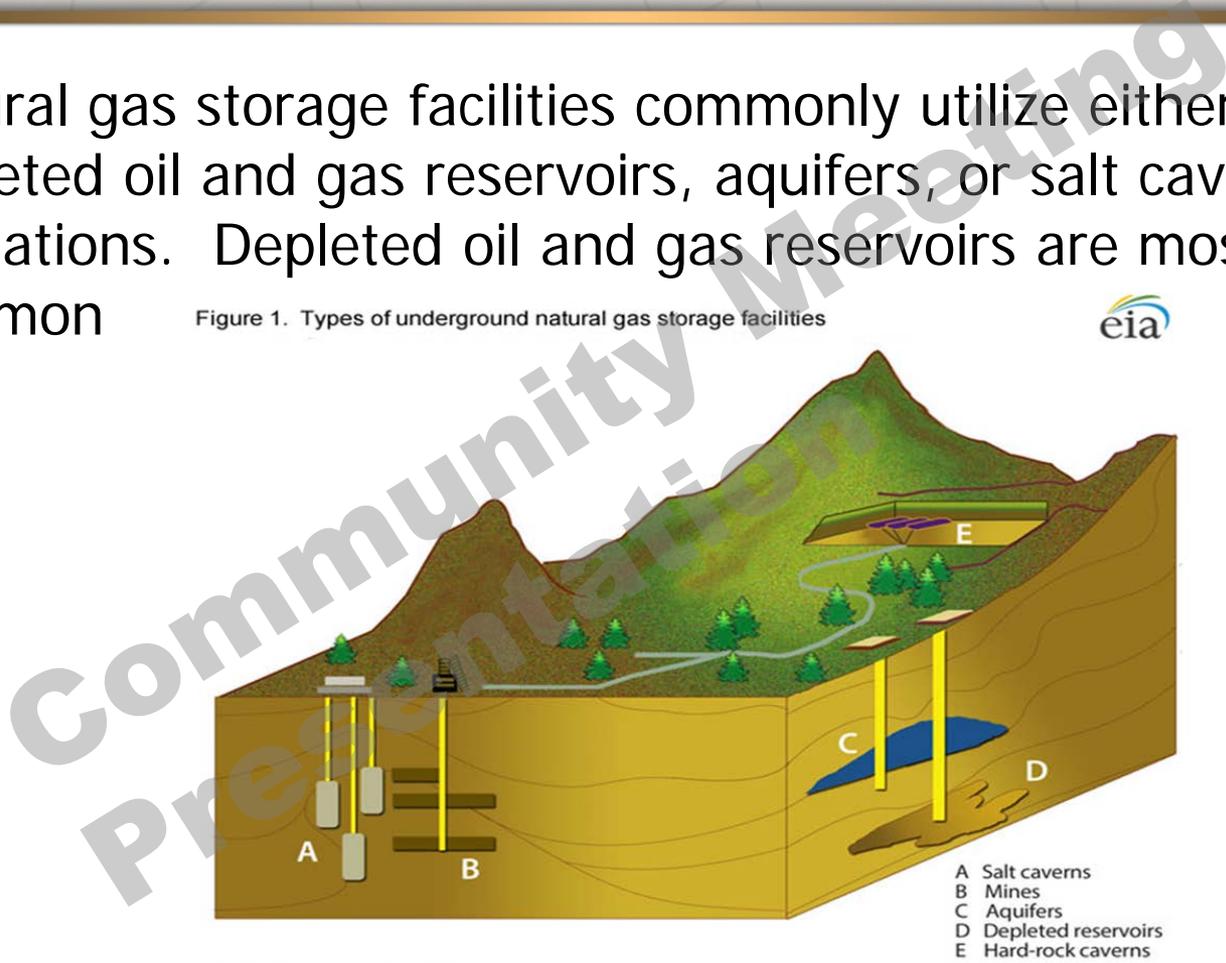
- What is a natural gas storage well?
 - Once an underground oil reservoir is depleted, it may be repurposed for a different use
 - Utility companies often purchase depleted reservoirs to use for underground storage of natural gas
- How is natural gas stored in a well?
 - The reservoir is intentionally re-pressurized, using existing wells and equipment with a new purpose to store natural gas
 - Natural gas storage wells always require injected pressure for storage and recovery

Basics of Underground Natural Gas Storage Reservoirs



- Natural gas storage facilities commonly utilize either depleted oil and gas reservoirs, aquifers, or salt cavern formations. Depleted oil and gas reservoirs are most common

Figure 1. Types of underground natural gas storage facilities



Source: PB-KBB, inc., enhanced by EIA.

Basics of Underground Natural Gas Storage Reservoirs



- Owners of natural gas storage facilities are usually pipeline companies, local distribution companies (LDC) such as SoCal gas, or independent storage service providers
- Natural gas storage facilities are normally used to “peak shave”. Peak shaving is necessary when the demand for natural gas, which may occur during periods of extremely cold weather, exceeds day-to-day production from upstream producers



The Inglewood Oil Field

- What is the lifecycle of an oil well?
 - An oil well initially uses natural pressure to bring hydrocarbons to the surface for productive use
 - Since an oil well is only naturally pressurized at the onset of production, most mature California oil fields have been pressure depleted
 - Because the fields operate at a low pressures, artificial lift is required to produce them





The Inglewood Oil Field

- The Inglewood Oil Field is a producing oil field under secondary recovery because there's not enough natural pressure.
 - Secondary recovery means external fluid (in our case water) is injected into the production zone to sweep oil from the reservoir.
- Artificial lift is part of a process known as secondary recovery, where pumps and other technology rather than natural pressure are necessary to produce oil.
- The majority of California's oil fields are in secondary recovery, with little pressurization.



Differences Between the Inglewood Oil Field and a Typical Gas Storage Reservoir

- What is the difference between an oil production well and a natural gas storage well?
- The primary difference is sustained pressure, natural vs. injected.
 - Oil-bearing formations have natural pressure that is depleted as the reservoir is produced
 - Natural gas storage reservoirs must be maintained at a sufficient reservoir pressure to meet needed deliverability rates during high demand periods. During low demand periods, gas is reinjected to restore the reservoir pressure
 - Natural gas storage wells are highly pressurized (2000-3000 psi) whereas California's oil wells typically operate at low pressures



Differences Between the Inglewood Oil Field and a Typical Gas Storage Reservoir

- Consider a balloon to illustrate this difference in pressurization.
 - A produced oil well is like a deflated balloon because it has been depleted of contents and is no longer pressurized
 - A natural gas storage well is like an inflated balloon that has been filled with natural gas and uses pressure to store it



NATURAL PRESSURE FROM AN OIL WELL



PRESSURIZATION OF A GAS STORAGE WELL



Differences Between the Inglewood Oil Field and a Typical Gas Storage Reservoir

- The physical properties of water vs gas are relevant to pressurization related discussions
- Water is incompressible. Gas is compressible
 - Shake up a capped bottle of water and open the cap. Nothing happens
 - Water is currently injected to maintain pressure but operations are designed to not significantly increase reservoir pressure
 - Shake up a can of soda pop and open the cap. What happens?
 - At a typical gas storage reservoir, gas wells will flow naturally until the reservoir reaches a very low pressure

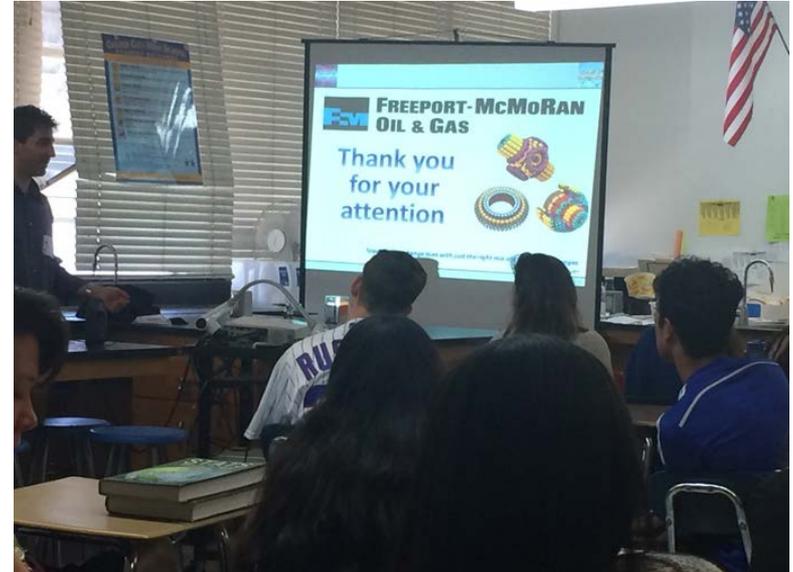


Community Partner STEM Festival

- We place an emphasis on programs and initiatives that improve science, technology, engineering and mathematics (STEM) education to help students acquire the skills necessary for success in a global, knowledge-based economy and society



Community Partner Nano Technology Workshop



Community Partner Upward Bound Program



- FM O&G partners with West LA College to support the Upward Bound 2016 Math & Science Summer Enrichment Academy
- Students from Crenshaw, Dorsey, Hamilton and Los Angeles High Schools participated in this summer's Academy
- The summer program concluded with an awards and recognition ceremony followed by a northern California college tour



Upward Bound Classic
Crenshaw, Dorsey, Los Angeles & Hamilton High School
"2016 Summer College Tour"



Contact Us

For questions or comments
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24 Hour Notification

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Community Meeting
Presentation