

EXHIBIT D

W 17165

LONG BEACH UNIT

Briefing Document



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Mineral Resources Management Division
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LONG BEACH UNIT

Briefing Document to Supplement Calendar Item 62 from CSLC's April 6, 2011 Meeting

Tidelands Grants

Between 1911 through 1935, the State of California (State) granted to the City of Long Beach (City) all of the tidelands within its city limits, from the mean high tide line to three miles offshore. The City received these properties from the State in trust, for the purposes of developing commerce, navigation, fisheries, and recreation.

Wilmington Field Discovery

The giant Wilmington Oil Field was discovered in 1932. It is one of the largest fields in North America and includes an onshore portion and an offshore portion, the latter extending through the tidelands area of the City. In Long Beach, the field is divided into the West Wilmington Field, which covers the City's harbor area first developed more than 70 years ago, and the East Wilmington Field, which covers the offshore area not developed until the mid-1960s. (See Figures 1 and 2 at end of this document).

West Wilmington

In 1939, the City's Harbor Department created a petroleum division and drilled the first well under the tidelands. The Long Beach Oil Development Company (LBOD), a consortium of oil companies, was selected as the City's first oil contractor. As development progressed during the 1940s and 1950s, the ground surface in the harbor area began to subside. The rate of subsidence exceeded two feet per year in 1951, and by 1958 the "subsidence bowl" reached 29 feet deep at its center and affected 20 square miles. The City and State joined to pass legislation that forced unitization of the subsided areas, and through the newly created units, waterflooding operations were initiated to halt subsidence and to increase oil production.

East Wilmington

With subsidence under control in the West Wilmington Field, the City explored the area east of the harbor with eight core holes in 1961 and confirmed that the oil field extended offshore. In 1962, City voters approved a referendum for offshore development of the East Wilmington Field. In 1964, Chapter 138 was enacted by the State Legislature to settle disputes between the City and the State, such as the boundary between the Tidelands and uplands, and the sharing the revenues to be derived from tidelands oil production in the East Wilmington Field.

Chapter 138

Chapter 138 provided for the formation of the Long Beach Unit (LBU) as the mechanism for developing the oil reserves beneath the offshore area, with the City being designated the unit operator with control over day-to-day operations. The State would have control over budgetary matters. Chapter 138 provided the City would receive a small share of Tidelands oil revenue each year, which would gradually decrease over the years to a minimum of \$1 million per year in the late 1980s. The State would receive the remainder of the oil revenue, which was by far the greatest portion, and all revenue derived from dry gas sales.

Long Beach Unit

The LBU was officially formed in 1965. The City selected THUMS, a consortium of oil companies consisting of Texaco, Humble, Union, Mobil, and Shell, as the contractor. The contract would run for 35 years, and enable the City, as trustee for the State, to retain approximately 96% of the net profits attributable to the unit. The LBU provides for the operation of both publicly-owned tidelands and privately-owned uplands as a single producing entity, and consists of three major areas. Tract 1 includes tidelands granted in trust to the City and comprises about 87% of the unit. Tract 2, comprising about 3%, is the parcel of Alamitos Beach Park Lands where the State owns the mineral interest. The remaining 10% is the upland area known as the Townlot and owned by numerous individuals.

Due to restrictions imposed by the City, development of the LBU had to be done from offshore drilling islands, and only with a pressure maintenance program to prevent subsidence of the land surface. The four man-made drilling islands built in the mid-1960s are now familiar landmarks along the City shoreline. Each island is about 10 acres in size and landscaped with palms and other vegetation, water falls, sound-blocking sculptures, and decorative lighting to obscure the oil operations. (See Figure 3). The islands are named in honor of four astronauts – Grissom, White, Chaffee, and Freeman – who perished in the early years of the U.S. space program.

Development of the LBU was rapid between 1965 and 1970. In mid-1967, twenty drill rigs were in operation with wells being drilled at the rate of one well every 3-1/2 days! Oil production peaked at 148,495 barrels per day in August 1969 before beginning an inevitable decline. During 1982 to 1986, a redevelopment program was undertaken to improve the effectiveness of the waterflood and increase oil recovery. Approximately 480 wells were drilled or redrilled and completed with shorter productive intervals. The shorter intervals isolated zones that contained oil that was by-passed in wells with long completion intervals. The sub-zone development effort increased oil production from 60,000 to 73,000 barrels per day.

Geology

The geologic structure beneath the LBU is a plunging anticline consisting of alternating sands and shales deposited during the Miocene to Pliocene ages. The major oil-bearing sands include the Tar, Ranger, Terminal, UP-Ford, and 237 zones. A shallow gas-bearing zone has also been

encountered in some portions of the unit. These sedimentary rocks are underlain by basement rock composed of metamorphic schist of Jurassic age, which can also contain oil where fractured. The uppermost zone occurs at a depth of about 2,000 feet subsea, while the basement is about 7,500 feet subsea. However, most wellbores are substantially greater in length because they must be drilled directionally at very high angles, and in some cases horizontally, to reach the reservoir target from the five drilling sites. The anticline is cut by large, normal faults that create multiple oil-bearing reservoirs in each zone. The Ranger zone accounts for nearly 70% of production.

Optimized Waterflood Program Agreement

The LBU was operated under the terms of Chapter 138 until 1992. In 1990, ARCO Long Beach, Inc. (ALBI, which had purchased the interests of the five original owners of THUMS to become the field contractor for the City), approached the City and State with a proposal to fund and implement a program to optimize waterflood operations in exchange for a share of the incremental tidelands revenue. In 1991, the State enacted Chapter 941 authorizing the City, State, and ALBI to enter into an “Optimized Waterflood Program Agreement” (OWPA), which became effective in 1992. The OWPA redefined the revenue split among the State, City, and ALBI for Tract 1 and the State and ALBI for Tract 2.

ALBI offered to invest at least \$100 million for the application of state-of-the-art technology to locate and produce additional recoverable oil from the LBU. To provide an incentive for ALBI to undertake the financial risk, the City and the State agreed to a projection of expected oil rate decline in the absence of the OWPA. The projected oil was defined in the OWPA as the “Base Production”. ALBI would continue to pay the original percentage of net profits on the Base Production, but would be allowed to keep a larger percentage of the net profits attributable to produced oil that exceeded the Base Production, or “Incremental Production.” Incremental revenue was to be divided as follows – 49% to ALBI, 42.5% to the State, and 8.5% to the City. The OWPA extended the term of the operating contract for as long as the LBU could economically produce oil and gas. The City remained as unit operator but ALBI was given more authority over the development planning and implementation.

In 2000, ALBI’s interests were assigned to Occidental Long Beach Inc. (OLBI). OLBI is now the City’s field contractor, while THUMS Long Beach Co. still exists as the agent for OLBI. In 2006, OLBI acquired interests in the West Wilmington field and is now the City’s contractor there too.

Current LBU Operations

The LBU is a mature waterflood with an average water cut of 97%. This means that out of every 100 barrels of fluid produced, 97 of barrels are water, and only 3 barrels are oil. Current production rates for the LBU are roughly 28,000 barrels per day oil, 1,000,000 barrels per day water, and 10,000,000 cubic feet gas per day. The water injection rate is 1,100,000 barrels per day. There are nearly 1,400 wells in the LBU – roughly 900 producers and 500 injectors. At present, the cumulative oil production is approximately 997 million barrels. The milestone one-billionth barrel from the LBU should be produced later this year!

Revenue to State

Since its inception in 1965, the LBU has yielded approximately \$5 billion in net profits revenue to the State of California. The State expects to receive \$277 million from the LBU for the current fiscal year. Expected revenue for future years is discussed later in this document.

Safety and Environmental Protection Standards

Several programs are conducted to assure that a high standard of safety and environmental protection is maintained at LBU facilities. In 2000, when the operator interests were assigned to OLBI, a comprehensive Safety Audit was conducted by CSLC engineers that covered all LBU facilities. The audit found that the corporate Process Risk Management program that OLBI had put into practice was comparable to programs used by other major producers, and was fully compliant with industry Process Safety Management standards and Federal OSHA regulations. The audit also resulted in major upgrades to several safety systems. At the direction of CSLC staff, automatic shutdown valves were installed on all outgoing subsea crude oil pipelines, and have since been installed on all the dry gas pipelines. The substantial funding OLBI spent to resolve the action items identified in the safety audit demonstrate its commitment to safety and spill prevention.

LBU Program Plan and Annual Plan

The LBU *Program Plan* is a five-year plan that outlines the strategies for maximizing profitability and maintaining excellence in safety and environmental protection. The Program Plan describes the reservoir management strategies to be implemented under the OWPA. The Program Plan proposed for July 2011 through June 2016 estimates total costs of \$1.9 billion and, with a conservative oil price assumption of \$45 per barrel, total revenue of \$2.1 billion, resulting in a total profit of \$188.5 million over five years.

The LBU *Annual Plan* proposed for July 2011 through June 2012 outlines in detail the cost outlays in five major categories – Development Drilling, Operating Expense, Facilities-Maintenance-Plant, Unit Field Labor and Administrative, Taxes-Permits-Overhead. In addition to the financial aspects of the budget, these plans include strategies to be employed in reservoir development and management, major issues facing the unit, and key goals in the areas of people, safety, and environmental protection.

The Annual Plan estimates that costs for the fiscal year will total \$377.6 million. The LBU is projected to produce 9.1 million barrels of oil, or 24,900 barrels per day. This production will generate \$410.8 million in revenue at the assumed conservative oil price of \$45 per barrel. This will result in \$51.7 million in net profit. However, oil prices have increased dramatically in recent months and are now above \$100 per barrel. If these conditions hold through next year the profit from the unit will be much higher than the Annual Plan predicts. See Figure 4 for a comparison of the estimated revenue, costs, and net profit at both a \$45 and a \$100 per barrel oil price. Note that at the \$100 oil price net profit increases to about \$554 million, or more than ten times

the figure estimated in the Annual Plan. This shows the significant roll oil price has when looking at the economics of the LBU.

The State has an influence on the development of both plans through the regular communication that occurs between staff of the CSLC and the City and OLBI on economic issues and the progress and success of individual projects. This communication has proved essential when projects or objectives require change, as it supports the overall operation of the LBU and ensures that it is as efficient as possible. Further, it is through this direct involvement that future program and annual plans are developed. Successful project models tested in the previous year form the framework for next year's plan. The efforts of staff helps ensure the LBU employs the best engineering practices available, which promotes efficient recovery, and a culture of safety and environmental protection.

Direct CSLC Staff Involvement in LBU

Engineering Committee and Voting Parties

CSLC staff engineers participate in monthly "Engineering Committee" and "Voting Parties" meetings with the City and OLBI. Engineering Committee meetings are where LBU projects involving major expenditures are reviewed and discussed. The proposed projects include well drilling, redrilling, investment well work (such as adding productive interval, installing inner liners, cleaning out, stimulating producing wells), and facility replacement, upgrade, or repair. The Engineering Committee meetings provide a forum for participants to discuss project goals and economic justification, as well as analysis of post-project performance. Budget goals are often discussed during the meetings. Voting Parties meetings are where individual projects are voted upon by for approval by the State, City and OLBI. The approvals result in OLBI preparing Authority for Expenditures (AFE's) which are needed to authorize and account for the funding of projects.

Review of Program Plans and Annual Plans

The Program Plan (or Five-Year Plan) is submitted to the State for approval every other year. The Program Plan is first sent to CSLC staff in draft form for review, so that questions and comments can be considered prior to its formal submittal. Once formally submitted, the CSLC has 45 days to complete its review and approve the plan. If no changes are ordered within the 45-day review period the plan is deemed to be reviewed and accepted by the CSLC. The Annual Plan is submitted to the CSLC in the same manner as the Program Plan except it is reviewed every year for consistency with the current Program Plan. Any Program Plan may be amended, supplemented or modified when necessary. These amendments are subject to CSLC review and approval. The CSLC has 30 days to review amendments.

Engineering Oversight

CSLC staff regularly oversees and monitors the LBU performance, particularly reservoir performance, facility issues, oil prices, revenue, expenses, and profit. This oversight ensures that a high standard of safety and environmental protection is maintained at LBU facilities. It also ensures that the best engineering practices are applied to all operations so that resource recovery from the unit is maximized. The daily involvement of CSLC staff also helps in

forecasting future revenue as accurately as possible and in responding to requests for information from management and all levels of government.

Accounting and Financial Review

CSLC accounting and finance staff reviews statements prepared by the City which show the State's share of LBU profits for each month to verify the statement figures agree with the monthly wire transfer payment amount sent to our Sacramento office. Additionally, each month's OWPA statement calculations are checked and verified for consistency with other statements. On a yearly basis, staff also reviews information supplied by an independent CPA firm hired by the City to verify that the State received revenue based on the correct oil prices during the year. Staff also conducts annual financial audits of key LBU parameters, including oil production totals, revenues, expenses, net profits, and the accuracy of the profit-sharing calculations.

Field Inspection

CSLC staff inspectors monitor LBU operations on a daily basis. Among their duties are formal monthly inspections of island safety and pollution prevention systems, witnessing oil sales meter calibrations, producing oil sales run-tickets, and verifying water cut and API oil gravity measurements. While performing these duties, CSLC inspectors also conduct daily surveillance of island operations for evidence of pollution. Daily reports generated by the inspectors keep staff engineers abreast of production and sales volumes, rig and facility operations, and accident or pollution issues. Staff inspectors also participate in annual in oil spill drills conducted for the LBU.

Subsidence Monitoring

CSLC staff engineers participate in the review of twice-annual measurement of ground elevations in and around the LBU to detect surface subsidence. Maps of elevation changes and reports that relate elevation changes to a balance of fluid withdrawal and injection are also reviewed. The City, as LBU operator, is responsible for monitoring and arresting subsidence attributable to oil production operations pursuant to Chapter 138. CSLC staff work with the City to prepare an annual budget for that subsidence monitoring. The budget is submitted to the CSLC for approval, while the twice-annual reports are submitted to CSLC for informational purposes.

Annual Management Review

Once per year the CSLC staff calls for a meeting of the management of all LBU participants – State, City, and OLBI – for a formal review of the previous year's performance and discussion of proposals for the coming year. The review covers all aspects of unit activity, from safety and environmental issues, project performance and reservoir monitoring, to future planning and goals.

Figure 1 – Location of Wilmington Oil Field

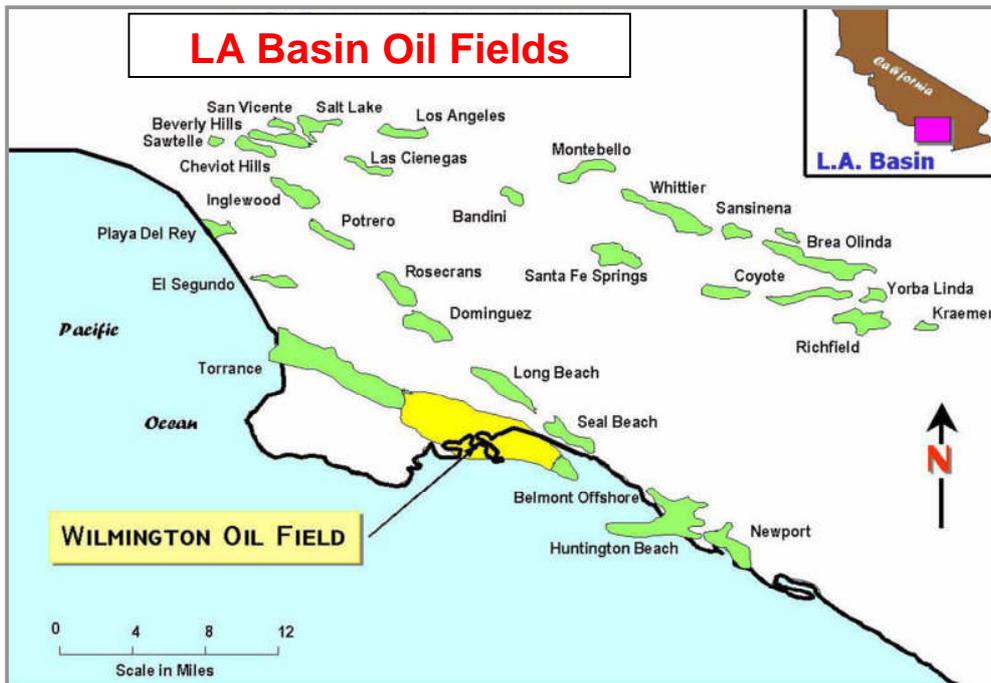


Figure 2 – West Wilmington and East Wilmington (LBU)

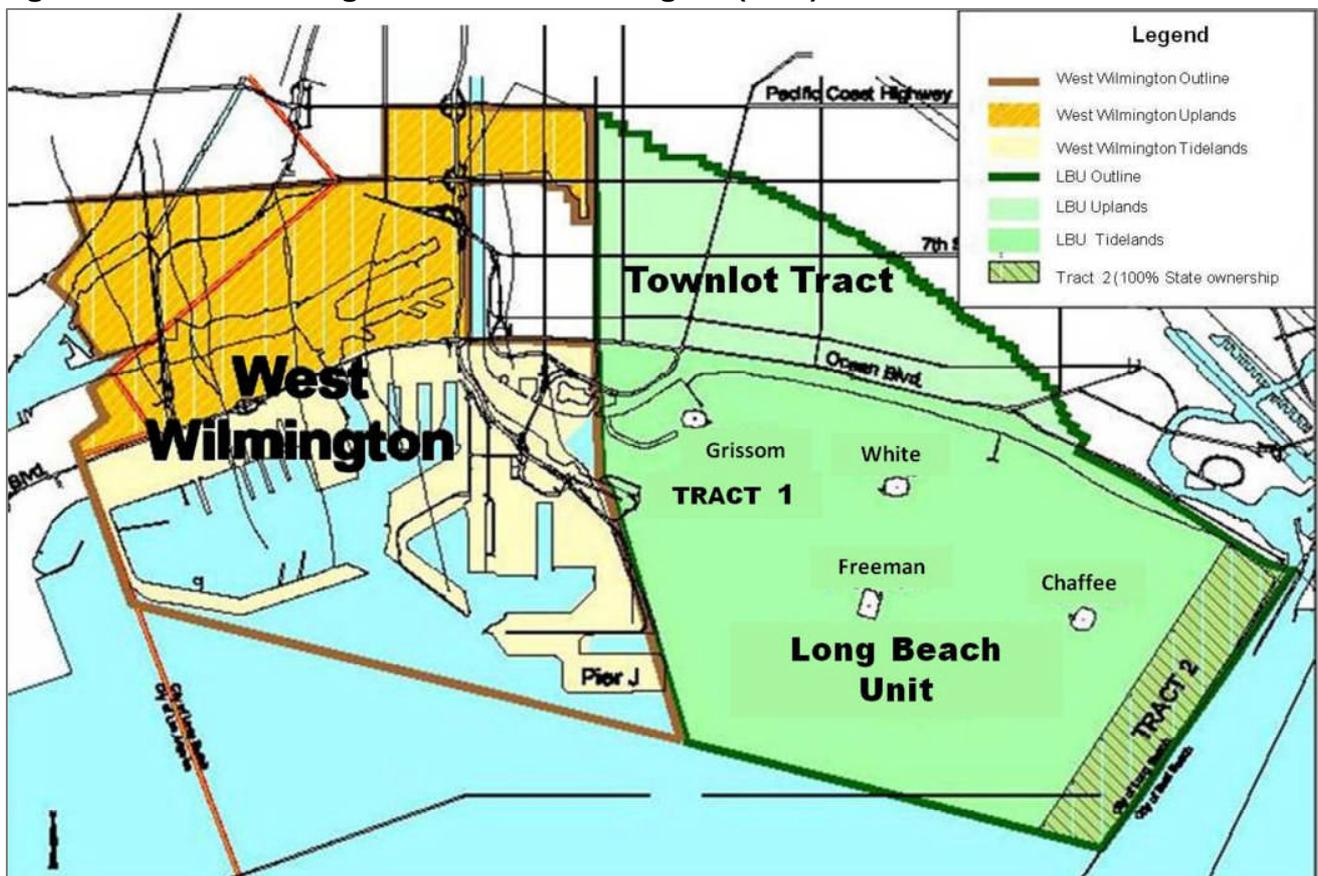


Figure 3 – Island White, one of four man-made islands in LBU



Figure 4 – Comparison of estimated revenue, costs, and profit at \$45 and \$100/bbl

