

BOLSA CHICA RESTORATION STEPS FOR PROTECTION OF ECOLOGICAL RESOURCES

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The Bolsa Chica area of Orange County in Huntington Beach is an interesting microcosm of southern California development. Named Bolsa Chica which in Spanish means little purse or pocket, it is the site where Spanish/Mexican Rancho grants met in the lowland gap between the Huntington and Bolsa Chica mesas. Vast areas of California were granted by the Spanish crown and later Mexican government to wealthy Dons and loyal soldiers. After statehood these grants were confirmed by the state and federal governments during the 1860's. Surveys of the California coast were done in 1873.

Lowlands of the Bolsa contained 2700 acres of wetlands according to the government surveys. These wetlands were a vital part of the coastal ecosystem and were used historically and extensively by both native and migrating birds. They were also nursery areas for juvenile marine fishes. Native Americans resided in the area for centuries.

When settled by the grantees and used for ranching and dry farming, typical of early California history, irrigation water was brought in. With the coming of the Anglos following the discovery of gold, intermarriage with the sons and daughters of the Dons diluted control over the land. Over the years these lands came under the ownership of the Americans. Portions were transferred to their sons and daughters, other lands were sold outside the families. By the end of the century most of the large ranchos no longer existed. The wetlands however were unsuitable for farming and remained undeveloped throughout the early 20th century.

Development of the Huntington mesa, so named for Henry Huntington, nephew of railroad magnate C. P Huntington, was done to provide rider-ship for the vast Pacific Electric interurban rail system founded by Huntington. An interesting sidelight to Henry is that he married his uncle's wife after Collis' death. Trolleys ran from downtown Los Angeles to Huntington Beach and beyond to the Newport/Balboa area. Lines also ran to Pasadena, Santa Ana, the San Fernando Valley and Long Beach – San Pedro. Over 1000 miles of interurban track was in place by 1906.

About 1900, the wetlands were acquired by a hunting club. Ocean water inflow was blocked off and the area diked and divided into numerous ponds to facilitate waterfowl hunting. A clubhouse was built on the Bolsa Chica mesa. Hunting continued until 1950 when oil was discovered under the land.

By 1960, most of the land in the gap was committed to oil production. Wells were drilled, pipelines constructed, and roads built for production of oil and gas. Oil was also discovered under the offshore and developed from platforms and by slant drilling from the upland along Pacific Coast Highway. These oil assets have been owned and operated by a number of companies over the years. Area Energy LLC is the current owner/operator of the field.

Discovery of oil under the land was in retrospect a blessing as the oil infrastructure militated against urbanization. But by 1970, development pressure in Orange County, particularly along the coastal strip, caused the Bolsa owners to look for ways to capitalize on this trend. In 1971, the ownership of the Bolsa gap property was divided between the mineral interests and surface rights. In this division, the surface owner committed to reimburse the mineral interest owner for certain development impacts if they adversely affected oil operations.

The surface owner immediately began efforts to develop residential housing in the upper part of the lowlands where oil operations were minimal. Eventually, only 1200 acres of the gap remained without housing. A 5800 unit housing plan was then proposed for this undeveloped area including a major thoroughfare across the wetlands. This proposal was unpopular with local environmentalists and open space advocates. Many of these folk questioned whether the wetlands might actually be owned by the state as tide and submerged lands despite the Rancho confirmation findings. The State Lands Commission and Attorney General's office undertook a study of the title and character of the land. As a result, the Commission asserted state ownership to a significant amount of the property.

It was clear that the State claim had merit. Negotiations with the land owner and title insurer began and over a number of months an agreement was worked out to settle the title issue. In a 1973 agreement, the State received title to 320 acres of the property including more than a mile and a quarter along Pacific Coast Highway. Title to the rest of the area was confirmed in the private owner. This agreement, while beneficial, did not satisfy the concerns over development of the area in the minds of the activists. They persisted in efforts to thwart development and preserve the wetlands. A group called the Amigos de Bolsa Chica was formed with the goal of preserving the remaining land as wetlands. They actively lobbied against development with the County, Coastal Commission and others.

A series of development plans were offered but each fell short of preserving all the undeveloped land. Lawsuits were filed and pursued, delays achieved and plans stymied. State and federal agencies discussed ways of preserving and protecting the land but funds were unavailable for acquisition. Things were at a standstill when it became known that the ports of Long Beach and Los Angeles were in need of mitigation credits in order to proceed with further port development, mostly expanded inter-modal facilities that required a large amount of fill in San Pedro Bay. The question was whether Bolsa Chica would meet this need.

California agencies (Department of Fish & Game, Coastal Conservancy, Resources Agency, State Lands Commission) and federal (National Marine Fisheries Service, Fish & Wildlife Service, Army Corps of Engineers and Environmental Protection Agency) together with the State Coastal Commission joined in a cooperative effort to use the restoration of Bolsa Chica as mitigation for port improvements. Then Interior Secretary Bruce Babbitt assigned some of his staff to help facilitate this effort. Evaluations were undertaken to assess the type and quantity of restoration that would mitigate port activities and result in restoration of wetlands at Bolsa.

During parts of 1994 and '95, studies covered the history of the Bolsa property, its uses over the years and the potential for contamination detrimental to restoration to exist at the site. Prior studies done by the surface owner were retrieved and analyzed. The conclusion was that Bolsa Chica could be effectively restored as functioning wetlands. Several seabirds used the site for nesting including the endangered snowy Plover and least terns, as well as Beldings savannah sparrow. Light-footed clapper rails were occasionally present. This use must be protected and expanded.

A schematic plan and budget were proposed. Using these as a guide, negotiations were begun with the ports and in the fall of 1996 agreement was reached whereby the ports would fund acquisition and restoration of Bolsa Chica in exchange for a cash payment of \$78,750,000 and mitigation credits. The ports would be relieved of any responsibility for the restoration. That role would be assumed by the state and federal agencies acting by consensus through a Bolsa Chica Wetlands Steering Committee made up of the four state and four federal agencies mentioned above. The agreement was recorded on February 14, 1997 and title to the 880 acres transferred to the State Lands Commission.

In April 1997, the Steering Committee began to meet regularly to develop a more detailed plan of the restoration. Over the next two years, the Steering Committee held a number of public workshops to familiarize the public with the Restoration Project. Various features of the Project were addressed at these workshops, public comments received and questions answered. From these sessions and the schematic plan a detailed preliminary plan was prepared. This plan included several options for restoration. Locations for the ocean inlet were defined and potential use of the area to conduct flood flows from the adjacent flood control channel considered. This was the basis for an environmental impact analysis.

A joint federal/state Environmental Impact Statement/Environmental Impact Report was prepared by the Chambers Group under contract to the State Lands Commission. The Commission was lead agency under the California Environmental Quality Act. For the National Environmental Policy Act, the Fish & Wildlife Service and Army Corps of Engineers were joint lead agencies. A draft EIS/EIR was released for public comment in July 2000. Required noticed public hearings were held as defined by statute. Seven alternatives including no-project, along with two alternatives to the preferred project, were analyzed in detail. Some non-mitigable adverse impacts were identified but were minor compared to the overall project benefits.

In January 2002 the State Lands Commission certified the EIS/EIR for compliance with the CEQA. That summer, under NEPA, the federal agencies issued notices of decision. Final design work was now begun. Proposals for this work were sought from contractors by the U. S. Fish & Wildlife Service. Moffatt & Nichol Engineers was retained to do the final design drawings and specifications. Construction bids were solicited during the summer of 2004. Kiewit Pacific Co. (KPC) was chosen to do the restoration. Work began in October 2004 following a ceremonial groundbreaking event.

Of interest here is the impact the restoration work would have on the existing oil and gas operations. Several agreements were entered into with Aera Energy LLC. One was to provide for the buyout of oil reserves affected by the restoration and abandonment of some 62 wells and infrastructure. In the Full Tidal Area existing oil wells, pipelines, well pads and downhole facilities were removed, the wells properly abandoned and the area cleared of all incompatible activities. Under the 1971 Agreement dividing the property into oil and surface ownerships, the surface owner was to pay oil interests for this work. This was accomplished with two agreements, the buyout was \$4.4 million and the abandonment came to \$5.2 million.

A third agreement was needed because construction of the ocean inlet under Pacific Coast Highway required a detour that would limit Aera's access to several wells during the period of the work. Two main concerns, how to minimize down time should a well fail and compensation for lost production value, were resolved by agreement through use of a specialized hydraulic work-over drilling rig and payment for any lost revenue due to delay or inability to access and repair failed wells. A special platform was designed and built to allow the work-over rig to set up over and access the impacted wells. This agreement resulted in less than \$700,000 in payments.

Finally, an agreement was needed to provide for Aera to relocate its pipelines and electrical facilities onto the new oil access bridge inside of the PCH bridge. The ocean inlet necessitated the bridge to provide continued access for Aera to facilities on the up-coast side of the inlet. The cost of this work is estimated to be \$1.4 million.

Restoration of the site was divided into several areas. The largest is the Full Tidal Area that was deepened to -9' MSL at the center. This area was excavated initially with normal land grading equipment to remove material unsuitable for ocean deposit and use to it form the core of the surrounding berms, nesting areas and roads. Then the area was flooded and sandy soil of a quality for ocean disposal was dredged and deposited offshore to pre-fill the offshore ebb shoal and prevent the loss of beach sand.

A Muted Tidal Area was constructed, connected to the Full Tidal Area with uniquely designed passive culverts that controlled the amount of water flowing in and out of the area. Three separate cells were constructed, each with its own culvert structure. Some oil activity remained in the Muted Tidal Area and the impact of this will be covered later.

Also in the restoration plan is a Seasonal Pond Area and an area for restoration to full tidal flow in the future when oil activity is no longer economic. Funds have been set aside for restoration of this latter site.

Before restoration could begin identification and characterization of contaminants was needed. In addition to past studies and reports, a detailed investigation was conducted by CH2MHill under contract to the Fish & Wildlife Service. Core samples were taken in a grid of about four samples per acre and analyzed for an array of elements and biota. A report was prepared containing a map of the sample points and test results categorized. Survival rates were assessed for species exposed to various levels of contaminants. Using this information an Ecological Risk Assessment was prepared.

Responsibility for clean up of contaminants was assigned to either Aera Energy (oil related material) or Hearthside Homes (non-oil contamination). Clean up goals were established for each of the constituents found. No highly toxic or dangerous levels of contaminants were found. To protect the wetlands and its plants and animals, the clean up goals were used to develop a plan for reducing exposure to contaminants. Material containing more than 1000 ppm of hydrocarbons was to be removed from the site or treated to reduce concentrations. Material with less than that amount was collected and used in the core of the berms surrounding the Full Tidal Area together with earth containing high concentrations of fines that was unsuitable for ocean disposal.

To expedite the Project, contamination in the Full Tidal Area was cleaned up as part of the restoration contract by the Project. Separate agreements with Aera and Hearthside will provide for clean up of the rest of the material exceeding the clean up goals.

The restored area needed to be protected from any future oil spills that might flow into the area from the ocean through the new inlet. Oil spill containment capability was designed into the Project. A storage/launch site was designed to provide for the deployment of a containment boom and clean up material and sited adjacent to the inlet channel. Gates were installed on all culverts leading to the Muted Tidal Area that could be shut if a spill potential existed.

Aera Energy has taken initiative to prevent oil contamination from its operations. An oil spill risk analysis was undertaken. Aera proposed installing additional facilities to further protect the area from an oil spill that might occur from oil production inside the Project as some production will continue within the area for many years. Some of these include passive weirs to trap surface oil, an oil sheen detection system, quick release stop panels on the culverts, lighting, marking of facilities to show which area would be impacted in the event of a leak, more boom deployment and fastening positions as well as relocation of some of its pipelines.

Passive weirs are designed to permit water to flow under this weir while retaining the surface layer that may have traces of oil thus maintaining vital intertidal flow to the wetlands. Control Structure gates were installed by the Project to connect the Muted Tidal Areas to the Full Tidal Area. These gates are controlled with a hand crank to open and close them; they normally will be in the open position. Aera determined that it would take a good sized man more than four minutes to close one gate by hand. Thus they proposed to retrofit the gates with electric motors that bolt on to the existing gates and are of the same manufacture. This would require supply of electric power that would also be available for lighting the controls.

For the culverts between the cells of the Muted Tidal Areas, Aera suggested it be permitted to install guides and drop plates that could slide down the face of the culvert to stop water flow between cells in case a cell became contaminated. Lighting was also to be included to assist in nighttime recognition of a spill and deployment of the plates.

Each of the control structures and culverts was marked with a color unique to that location to aid Aera employees and others in closing off the proper area depending on the location of a spill. This information would be kept in operating manuals by both Aera and the property manager.

To assure the fullest level of protection Aera hired an oil spill consultant to review the site and Project installations and make recommendations for additional protection measures. In addition to the above mentioned steps, the consultant suggested that additional boom deployment sites be developed. One of these would be at the node along the 70 Road where the SBO 72 wells are located. This could be a place for a boom storage shed that also contained other clean up supplies. Another site was adjoining the Project boom storage and deployment area north of the inlet channel and a tie down point along the 70 Road.

The inlet to the Full tidal Basin was connected to the sea at 5:52 AM on August 24, 2006. Bolsa Chica's restoration to a functioning wetlands is one of the largest attempted on the west coast. That it was restored is due to the cooperative effort of individuals representing the state and federal agencies. And to no lesser degree to the willingness of Aera Energy to work with the Steering Committee without which the Project would have been considerably more difficult.