7.0 ALTERNATIVES TO THE PROPOSED ACTION

7.0 ALTERNATIVES TO THE PROPOSED ACTION

In conformance with CEQA Guidelines §15126.6, the EIR has included a comparative impact assessment of "alternatives to the proposed project". The primary purpose for this section is to provide decision-makers and the public with a "reasonable range" of project alternatives which could feasibly attain most of the basic project objectives, while avoiding or substantially lessening any of the project's significant adverse environmental effects. Important considerations for this alternatives analysis include (as noted in §15126.6):

- "...An EIR need not consider every conceivable alternative to a project."
- An EIR should identify "alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process..."
- Reasons for rejecting an alternative include:

  "...failure to meet most of the basic project objectives";

  "...infeasibility"; and

  "...inability to avoid significant environmental effects".

Other than temporary, short-term air quality emissions associated with construction activities, the EIR has not identified any "unavoidable" significant impacts of the project, as all potentially significant impacts can be mitigated to less than significant levels. However, certain cumulative impacts, to which the project would contribute, may be slightly reduced with some of the alternatives. Project-related cumulative impacts include air quality and noise, although the project's contribution is not "cumulatively considerable" as defined in CEQA Guidelines §15126.6. As noted in Section 3.4, *PROJECT NEED AND OBJECTIVES*, the proposed project's "basic objectives" consist of:

- Provide a reliable local source of potable water to Orange County that is sustainable independent of climatic conditions and the availability of imported water supplies or local groundwater supplies;
- Provide product water that meets or the potable ("drinking water") requirements of the Safe Drinking Water Act (SDWA) and the Department of Health Services (DHS);
- Reduce salt imbalance of current imported water supplies by providing a potable water source with lower salt loads for blending with existing supplies;
- Remediate the subject site of on-site contaminants resulting from approximately 35 years of use as a fuel oil storage facility in order to protect the health and safety of those in the surrounding community;
- Create ecosystem and biologic resources benefits that may accrue due to decreased pressures on existing water resources and reduced contamination within receiving waters; and
- Minimize demands on the existing imported water system.

The following alternatives to the proposed project are discussed: "No Project" alternative; "Alternative Site" alternative; "Alternative Ownership and Operation" alternative; "Alternative Project Design" alternative; and "Environmentally Superior" alternative. A comparison of issues with implementation of identified alternatives is provided within Table 7-1, *COMPARISON OF ALTERNATIVES.*

Table 7-1
COMPARISON OF ALTERNATIVES

Issue	No Project	Alternative Site	Alternative Ownership and Operation	Alternative Project Design	Reduced Facility Size
Land Use/ Relevant Planning	<	N/A =/>	=	>	=
Geology, Soils, and Seismicity	<	</=	=	=	=
Hydrology, Drainage and Storm Water Runoff	<	=/>	=	=	</=
Air Quality	<	=	=	=	</=
Noise	<	=/>	=	=	</=
Public Services and Utilities	> (water supply)	=	=	=	=/>
Aesthetics/Light & Glare	<	=/>	=	>	=
Hazards/Hazardous Materials	<	=	=	=/>	=
Construction Related Impacts	<	</=	=	>	</=
Ocean Water Quality and Marine Life	<	>	=	<*	</=
Product Water Quality and System Integration	<	=	=	=	=

LEGEND

= Impact is equivalent to impact of proposed project (neither environmentally superior or inferior).
< Impact is less than impact of proposed project (environmentally superior).
> Impact is greater than impact of proposed project (environmentally inferior).
* Some alternatives may have greater impacts to marine life than the proposed project

7.1 "NO PROJECT " ALTERNATIVE

None of the impacts associated with the proposed development and construction activities would occur if the "No Project" alternative were selected. Implementation of this alternative would leave the existing portion of the fuel oil storage facility, proposed pipeline alignment, and proposed underground booster pump station sites in place, and would avoid any adverse physical or environmental impacts associated with the proposed project. Existing geologic, soils, and aesthetic conditions in the area would remain the same. Air quality, noise, and traffic impacts due to construction of the desalination facility, pipeline, and pump stations would not occur with the "No Project" alternative.

The "No Project" alternative is not presently being considered because it fails to meet the basic project objectives. In addition, the existing project site degrades the aesthetic character of the vicinity and, if not remediated as proposed, may pose a significant health risk due to petroleum hydrocarbon contamination. Furthermore, the "No Project" alternative would not realize the project benefit of providing a "drought proof," high quality, new potable water supply.

Water planning professionals have forecasted that water demands would increase in the Southern California area, and have specifically identified resource targets to help meet projected demands, including local seawater desalination facilities. (See Table 7-2 *MWD UPDATED RESOURCE TARGETS.*) Consequently, adoption of the "No Project" alternative would result in shifting the obligation for meeting a portion (up to 56,000 acre-feet per year) of future water demands from the project to: 1) increased conservation efforts (efficiency improvements and reduced consumption); 2) increased use of imported water supplies; 3) increased use of groundwater supplies; 4) construction of additional local water supply projects; and/or 5) construction of seawater desalination projects elsewhere in Orange County. In some instances, therefore, the environmental impacts associated with the "No Project" alternative may be greater than those associated with the project.

Table 7-2 (From MWD's 2003 IRP Update)
MWD UPDATED RESOURCE TARGETS (WITH SUPPLY BUFFER)

	1996 IRP 2020	IRP Update 2020	Change	IRP Update 2025
Conservation	882,000	1,028,000	+145,600	1,107,000
• Recycling • Groundwater Recovery • Desalination	500,000	750,000	+250,000 (buffer)	750,000
Colorado River Aqueduct *	1,200,000	1,250,000	+50,000	1,250,000
State Water Project	593,000	650,000	+57,000	650,000
Groundwater Conjunctive Use	300,000	300,000	0	300,000
CVP/SWP Storage and Transfer	300,000	550,000	+250,000 (buffer)	550,000
MWD Surface Storage **	620,000	620,000	0	620,000

* The 1,250,000 acre-feet supply from the Colorado River Aqueduct is a target for specific year types when needed. Metropolitan is not depending upon a full aqueduct in every year.
** Target for Surface Storage represents the total amount of water that can be extracted from storage.

1. Increased Conservation Efforts

As explained in the Metropolitan Water District of Southern California (MWD) 2003 IRP Update, "conservation reduces water demand in ways that are not easily measured or metered. Demand is reduced through changed consumer behaviors and savings from water-efficient fixtures" (page 26). Calculating against a base year of 1980, the Municipal Water District of Orange County (MWDOC) has projected that Orange County water users would conserve 84,000 acre-feet in 2005. One result of selecting the "No Project" alternative could be an increased obligation for Orange County water users to conserve an additional 56,000 acre-feet per year, commencing as early as 2008 (when the project is expected to be in full production).

Adding an extra 56,000 acre-feet per year to the 84,000 acre-feet of annual conservation that is occurring in Orange County would be difficult because the MWD 2003 IRP Update already set significantly increased conservation targets for Orange County to reach by 2020. The 1996 IRP target of 882,000 acre-feet for the MWD service area was increased to 1,028,000 acre-feet in the 2003 IRP Update – a regional increase of 145,600 acre-feet per year (see Table 7-2). This equates to increased conservation expectations in Orange County of 64,000 acre-feet over and above the 84,000 acre-feet per year projection for 2005. To realize an additional 56,000 acre-feet of conservation savings each year would essentially require doubling of the County's future conservation efforts. To double the future conservation efforts of the County in such a relatively short time period would require, at a minimum, the imposition of prescriptive conservation standards for activities, like outdoor residential irrigation, that are today considered discretionary consumptive water use.

2. Increased Use of Imported Water Supplies

The western USA is in the sixth year of a drought. Southern California is in its fifth year of drought (2003/04 water year). If the region is in a 20-year drought cycle, as Scripps Climate Research Division scientists have strongly suggested, then imported water would be difficult to obtain from the primary sources of the State Water Project (Sacramento Delta) and Colorado River. Still, Table 7-2, *UPDATED RESOURCE TARGETS,* shows that water planners are continuing to project increased reliance on imported water supplies.

Surplus water from the Colorado River is not likely to be available because of the drought. MWD's plan for dealing with imported water shortages (beyond recent storage increases) has been to purchase agricultural water from Northern California (through the Sacramento Delta). "In January 2003, Metropolitan's Board authorized one year transfer option agreements with 11 Sacramento Valley Water Districts to ensure water supply reliability. Metropolitan secured 146,230 acre-feet of options from these districts, of which 126,230 acre-feet were exercised" (MWD web page, September 2004). These water transfers are allowed and encouraged by state policy, but have economic dislocation and environmental issues related to the Delta that would be increased if additional supplies are required using these measures. As a matter of policy, water transfers are typically short-term arrangements, and, as such, are not sufficient to offset reliable long-term sources of supply.

To realize an additional 56,000 acre-feet of imported water supplies each year would result in economic and environmental impacts resulting from such transfers. An increase in imported water supply would exacerbate environmental degradation occurring along such areas as the Colorado River and Sacramento-San Joaquin Delta due to the existing diversion of supply to Southern California.

3. Increased Use of Groundwater Supplies[1]

Groundwater withdrawals from the Santa Ana River Groundwater Basin have averaged approximately 350,000 acre-feet per year during the period 1998-2002 (OCWD Grand Jury Report, page 7). In comparison, natural and artificial recharge efforts average approximately 270,000 acre-feet per year (OCWD Grand Jury Report, page 9). To make up for the imbalance, OCWD has purchased an average of 60,000 acre-feet of imported replenishment water from MWD each year for supplementary recharge and 20,000 acre-feet of water each year (via the first phase of the Groundwater Replenishment System [GWRS] and purchases from MWD) for injection into seawater barriers. Since the 1997-98 water year (a wet year), the County has experienced dry conditions,

1 The information in this section was reviewed and confirmed by John Kennedy of the Orange County Water District (OCWD) in September, 2004.

resulting in overdrafts in excess of 30,000 acre-feet per year. In November 2002, the accumulated overdraft was estimated to be more than 400,000 acre-feet, which prompted OCWD to take actions to limit groundwater production rates and reduce the rate of withdrawal to about 324,000 acre-feet per year in 2003-04. Pumping for the current 2004-05 year has been limited to 316,000 acre-feet and is expected to be reduced to 311,000 acre-feet in 2005-06 (Grand Jury Page 8). To realize an additional 56,000 acre-feet from groundwater supplies each year would risk damaging the capacity, reliability and performance of the groundwater basin, particularly in regards to an increased susceptibility of coastal groundwater aquifers to seawater intrusion.

The ability to increase the volume of water taken into the basin is limited by the geology of the area. Current recharging capacity is approximately 300,000 acre-feet per year (Groundwater Recharge Brochure, OCWD). The groundwater basin is sustained by natural and man-made recharging (introduction of water) of the basin aquifers. OCWD manages a very sophisticated system of lakes (i.e. percolation ponds) in Orange and Anaheim that seep water through the lake bottoms. Each of the lakes acts like purification funnels delivering water into the groundwater basin. It is interesting to note, that only in that area of the county is the soil composition of the sand and gravel conductive to water traveling to deep aquifers. Underlying the rest of the ground water basin is a fairly consistent clay layer that prevents significant percolation into the groundwater basin outside the Anaheim and Orange areas. Over the years, constantly improving this recharge system has tripled the yield of the groundwater basin. It is estimated that by 2020, additional improvements would be required to increase percolation capacity by 70,000 acre-feet per year to meet future groundwater demands. It should also be noted that the Groundwater Replenishment System, or GWRS, (GWRS, 2008 operation) would produce 70,000 acre-feet per year and half of its water would be piped to the percolation ponds described above and half would be injected into the seawater barriers (O.C. Water 101 - Where Do We Get Our Groundwater? - OCWD web site).

Therefore, the ability of the groundwater basin to increase output or increase inflows of recycled/reclaimed water is limited.

4. Construction of Additional Local Water Supply Projects

As shown in Table 7-2, MWD is projecting that local projects (recycling, groundwater recovery and desalination) would shoulder a greater portion of the burden in meeting future water demands. Clearly, it is expected that several additional water supply projects would be constructed in coming years as the target set by the 1996 IRP for 2000 – 300,000 acre-feet of supply from local projects - was missed. As of 2002, local projects produced 251,000 acre-feet per year. As summarized in the MWD 2003 IRP Update, "meeting the targets would require the region to produce 159,000 acre-feet of additional local project and/or seawater desalination supply by 2010 and 249,000 acre-feet by 2020." The GWRS project and potential phased expansions are currently included in the MWD 2003 IRP Update. Through implementation of those projects and others, MWDOC is planning to increase the contributions of local projects by 162,000 acre-feet per year, and has plans to add another 50,000 acre-feet per year of "buffer projects" to match the MWD 2003 IRP Update plans for supply. To realize an additional 56,000 acre-feet from additional local water supply projects each year (over and above the significant increases that are already planned) would require implementation of 10 to 12 new projects: a 30 percent increase over current plans.

5. Construction of Seawater Desalination Projects Elsewhere in Orange County

This alternative is discussed in Section 7.2 *"ALTERNATIVE SITE" ALTERNATIVE*.

7.2 "ALTERNATIVE SITE" ALTERNATIVE

Huntington Beach Generating Station (HBGS) Alternative Site

An alternative site (formerly the proposed project site within Initial Study prepared for the previously circulated EIR, dated May 17, 2001) for the desalination facility is located southwest of the current project site, within the HBGS, with HBGS office buildings to the west, an electrical switchyard to the north, and fuel oil storage tanks to the east. The alternative site is located within approximately 300 feet of the proposed project site, closer to the residential uses to the west. Project operation and equipment would be similar as with the project. However, the primary constraint for this site that led to its rejection is potentially significant temporary and permanent disruption to HBGS parking, access and operational activities, as the site is located immediately adjacent to the generating units and would displace existing parking, access areas and buildings. In addition, due to the site constraints that would be placed on HBGS from this alternative, it may preclude the power plant from converting to gas turbine combined cycle operation in the future. As such, this alternative site is not considered feasible.

Alternative Locations Within a Two-Mile Radius of the HBGS

A preliminary investigation of available land (five acres or larger) within a two-mile radius of the HBGS was performed for the proposed project. Open areas were identified within the two-mile radius using aerial photographs and information obtained from the City of Huntington Beach website.

As shown in Appendix R, *LOCAL ALTERNATIVE SITE INVESTIGATION*, most of the open areas are parks and schools within the local community. There are total of eight parks identified in the two-mile radius, and most are less than five acres in size. In addition, there are five schools located in close proximity to the identified parks. Other open areas include: wetlands, Orange County Sanitation District (OCSD) property (reserved for future plant expansion) and the Ascon/Nesi site (a former landfill approximately 40 acres in size). The Ascon/Nesi site is a highly contaminated piece of property and is currently under DTSC review for clean-up, and therefore this is not a viable alternative for the desalination project. There are three open areas to the northwest of the HBGS. However, all three sites are proposed for development. One of the sites is the former CENCO tank farm (25 acres), for which an entitlement application is in process for construction of 204 homes. The remaining two sites include the new Pacific City development located west of Huntington Street, and the new Hyatt Regency Huntington Beach Resort and Spa located west of Beach Boulevard, which has since been developed.

According to the City of Huntington web page, only three of the parks analyzed within the site investigation are at least five acres. These parks consist of:

- Gisler Park, 11 acres;
- LeBard Park, five acres; and
- Talbert Regional Park (the north part of the park is 99.1 acres while the south part of the park is 88.5 acres).

As these park facilities are actively utilized for recreation by the local community and no proposals to convert these facilities to alternative uses exist, no sites within a two-mile radius are feasible for implementation of the proposed desalination facility.

Alternative Locations Outside of the City of Huntington Beach

Several other locations outside of the City of Huntington Beach have also been considered for this project, including the mouth of San Juan Creek (within the City of Dana Point), San Onofre (within San Diego County), and along the coast of the City of San Clemente (refer to Exhibit 7-1, *ALTERNATIVE SITE LOCATION MAP,* and Table 7-3, *ALTERNATIVE SITE COMPARISON).* These alternatives are not being considered for a variety of reasons, such as environmental concerns of a new ocean intake/discharge system (San Clemente) and/or engineering/acquisition issues (San Onofre). A discussion of potential impacts is discussed below.

Land Use/Relevant Planning

Impacts in regards to land use/relevant planning vary primarily on uses surrounding the project site and general plan/zoning designations for the site. Sensitive uses (residences, schools, recreational areas, etc.) exist in the vicinity of the San Juan Creek and San Clemente locations, thereby creating a greater potential for land use impacts to occur for these two alternative sites. In addition, the proposed industrial use may conflict with existing General Plan, and zoning designations within the City of Dana Point, City of San Clemente, and County of San Diego. The HBGS alternative site would have potentially significant operational impacts upon HBGS.

Geology and Soils

Geology and soils impacts are dependent on the unique geological/soil characteristics of each alternative site considered. However, project implementation on an alternative site would comply with the Uniform Building Code (UBC) and all other State and local regulations in regards to geologic and seismic safety. Impacts are anticipated to be similar to those of the proposed project site, although the HBGS alternative site avoids issues associated with the OCFCD channel.

Hydrology, Drainage and Storm Water Runoff

Implementation of the proposed project at an alternative site outside of the City of Huntington Beach would likely have similar impacts in regards to hydrology, drainage, and storm water runoff. As the design, area, and operation of the proposed desalination facility would generally remain the same (i.e. incorporation of an adequate on-site storm water drainage system), both construction and long-term operational impacts are anticipated to be similar to those of the proposed project.

Air Quality

Implementing the proposed desalination project on an alternative site would have similar air impacts to those of the proposed project site. As stated above, the design, area, and operation of the proposed desalination facility would generally remain the same. Therefore, air impacts resulting from short-term project construction and long-term facility operation would be similar to those of the proposed project site within the City of Huntington Beach.

Noise

Impacts in regards to noise are anticipated to be similar to those of the proposed project site. As stated above, the design, area, and operation of the proposed desalination facility would generally remain the same. It is anticipated that the same noise-generating equipment (pumps, compressors, etc.) and noise attenuation measures would be incorporated upon implementation on an alternative site. In addition, the level of noise generated by mobile sources (automobiles driven by on-site employees, delivery trucks) would not change, as facility operations would not significantly change. However, alternative sites with nearby sensitive receptors may create greater noise impacts.

Public Services and Utilities

Implementing the proposed desalination facility on an alternative site is anticipated to have similar impacts in regards to public services and utilities as the proposed project site. As stated above, the design, area, and operation of the proposed desalination facility would generally remain the same. In addition, impacts to public services and utilities such as police/fire service, solid waste, sewer, drainage, and electricity would not vary significantly from proposed project site implementation within the City of Huntington Beach.

Aesthetics/Light & Glare

As stated above, the design, area, and operation of the proposed desalination facility would generally remain the same. Although building height and lighting standards vary by city/county, it is expected that impacts in regards to aesthetics, light, and glare on an alternative site would be similar in nature to proposed project site implementation. However, construction of a new facility in a sensitive coastal environment absent of industrial uses (San Clemente) may have significant aesthetic impacts.

Hazards and Hazardous Materials

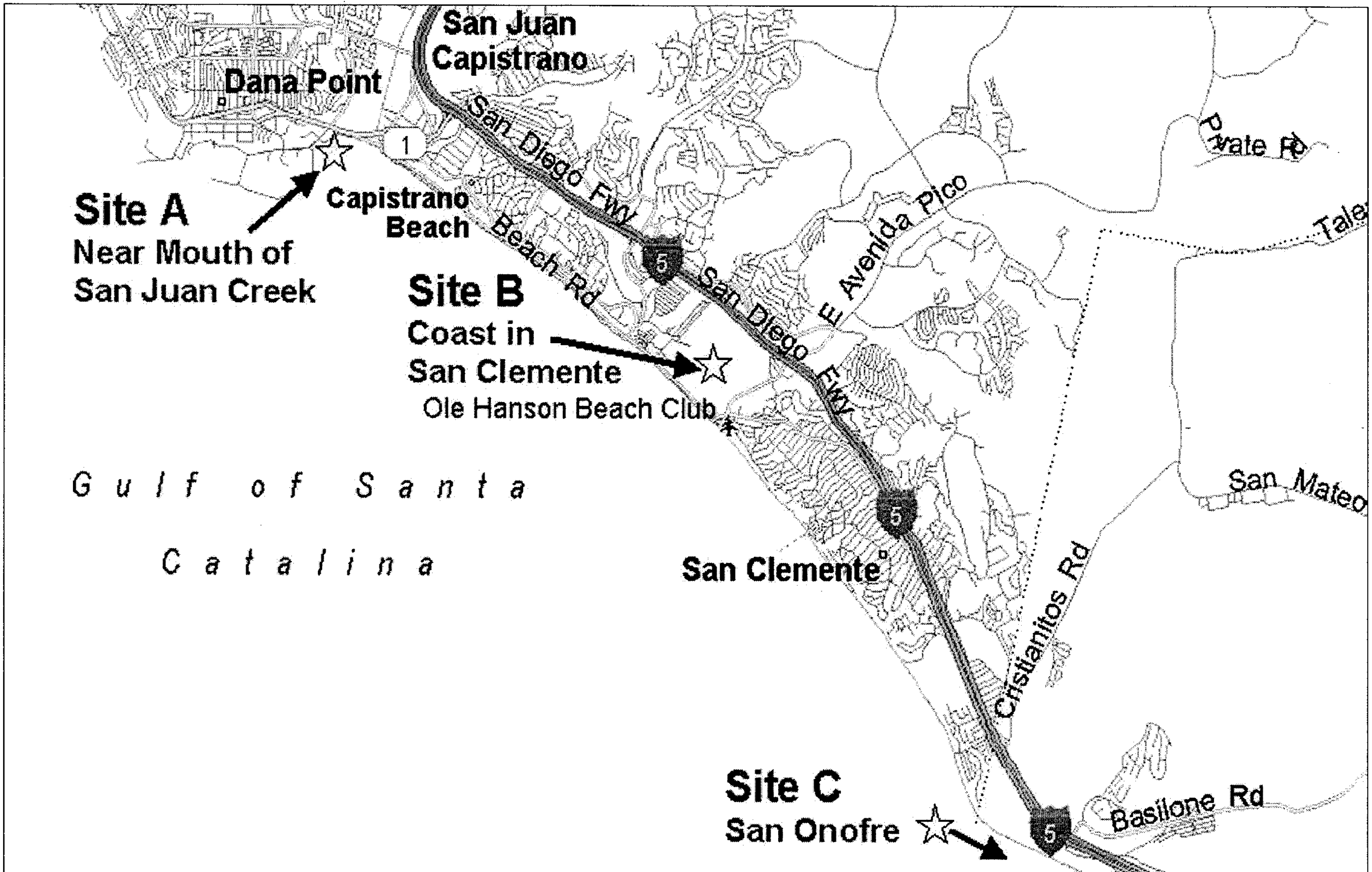
Impacts in regards to hazards and hazardous materials are anticipated to be similar to those of the proposed project site. The nature in which hazardous materials would be stored, handled, and used for project operation is not expected to change upon alternative site implementation. However, one or more alternative sites may have less existing site contamination.

Construction Related Impacts

As stated above, the design, area, and operation of the proposed desalination facility would generally remain the same. Although many short-term construction impacts (primarily noise and air) would vary by the amount of grading necessary, it is anticipated that the phasing and construction process would not vary significantly from proposed project site implementation. However, construction-related impacts due to pipeline implementation are anticipated to be lower for the alternative sites in comparison to the proposed project site, as shorter lengths of pipeline would be necessary to convey product water to the distribution system (refer to Table 7-3, *ALTERNATIVE SITE COMPARISON*).

Ocean Water Quality and Marine Life

Depending on the alternative site selected, impacts in regards to ocean water quality and marine life may be greater than those of the proposed project site. If implementation of the proposed project on an alternative site requires the construction of new intake and outfall facilities for plant operation (as is the case with the San Clemente alternative site), substantial impacts to marine biological resources would occur, as construction and operation of plant facilities may disrupt sensitive marine habitats. If the desalination facility were to utilize existing intake and outfall facilities (as is the case with the San Onofre alternative site), impacts are anticipated to be similar to those of the proposed project site within the City of Huntington Beach. MWDOC, which is considering the implementation of a desalination facility at the San Juan Creek location, is exploring the use of beach wells as a seawater intake. Although a beach well intake system may result in decreased marine biological impacts compared to the proposed project, this benefit is negated somewhat by the need to construct a new ocean outfall for concentrated seawater discharge.



Source: Poseidon Resources Corporation, August 2004.

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SEAWATER DESALINATION PROJECT AT HUNTINGTON BEACH

Alternative Site Location Map

Exhibit 7-1

Table 7-3
ALTERNATIVE SITE COMPARISON

	Near Mouth of San Juan Creek	Coast in San Clemente	San Onofre	Huntington Beach
Environmental Issues	Many	Many	Many	Temporary
Land Use	Many Issues	Many Issues	Few Issues	None
Land Cost	Very High	Very High	Moderate	Moderate
Seawater Supply	Beach Well Intake	Requires New Intake	Could use Existing Intake	Existing
Effluent	Requires New Outfall	Requires New Outfall	Could use Existing Outfall	Existing
Required Piping	< 2 miles	2-5 miles	5-7 miles	10 miles
Public Perception Issues	High	High	Very High	Moderate

Product Water Quality

As the reverse osmosis treatment process utilized at an alternative site would be similar to that of the proposed project, the quality of product water is anticipated to be similar. While source water (i.e. ocean water) quality may vary by site, the reverse osmosis treatment process would most likely be capable of producing water meeting all Department of Health Services (DHS) requirements. Impacts due to product water compatibility are anticipated to be similar to the proposed project.

Conclusion

While the alternative site locations offer advantages over the proposed project site by reducing the length of the product water pipeline, the San Juan Creek and San Clemente sites would have greater impacts due to sensitive surrounding uses and the need to create a new ocean intake/outfall. Implementation of the "Alternative Site" alternative would not avoid the project's identified unavoidable air quality impact, and may result in significant aesthetic and/or marine biological impacts. This alternative is not presently under consideration.

7.3 "ALTERNATIVE OWNERSHIP" ALTERNATIVE

The "Alternative Ownership" alternative would not change any of the design or operational features of the project. Rather, this alternative consists of the exact same project owned and operated by a public entity. The project proponent, a private entity, has already obtained lease rights to the site through negotiations with the current land owner (AES Huntington Beach, LLC). For this alternative to be feasible, a public entity would first need to negotiate with the applicant or otherwise obtain lease rights to the site.

Assuming that rights to the site were acquired by a public entity, this alternative would result in all of the same potential environmental impacts that would result from implementation of the project as proposed (under private ownership). It has been asserted that operation of seawater desalination projects by private entities may result in potential environmental impacts over and above those that would result if public entities operated such plants because private entities with multinational ties could seek to avoid state and local environmental regulations by relying on treaties now in effect or being negotiated by the United States. Upon reviewing this assertion, the California Department of Water Resources has come to the opposite conclusion.

> "No international trade treaty now in effect or being negotiated by the United States would prevent local, state, or federal government agencies from reviewing and regulating water projects that involve private companies with multinational ties. Such projects include desalination plant, water transfers, water storage projects (both above and below ground), and wastewater reclamation projects. So long as government regulations are applied in the same manner to water projects involving multinational corporations as they are to water projects owned or operated by domestic companies or public utilities, there would be no conflict with international trade treaties." (2004 California Water Plan, Volume 1, Chapter 2, page 26.)

It should be noted that the project proponent, Poseidon Resources Corporation, is a U.S. corporation based in Connecticut, and is not a multi-national corporation.

Consequently, the "Alternative Ownership" alternative and the project as proposed would result in the same potential impacts on the environment.

7.4 "ALTERNATIVE PROJECT DESIGN" ALTERNATIVE

Alternative Methods of Desalination

Alternative methods of desalination, such as thermal distillation, have been previously considered in coastal desalination development using a variety of technologies. The MWD, in combination with a consortium of architects, engineers, and a desalination process vendor, proposed a 12.6 mgd multiple-effect-distillation (MED) desalination project under the MWD Desalination Research and Innovative Partnership (DRIP) program in 1996 to be located within the immediate vicinity of the HBGS. Used initially for industrial desalination, the MED process is an alternative process to reverse osmosis. While there are certain advantages to the MED process when compared to the RO process (power consumption not dependent on seawater salinity, higher product water quality, does not require sophisticated pretreatment; and no high-cost membrane replacement elements), the extreme height required for the vertical tubes (300 feet) and the dependency on power plant operation for steam supply precluded MWD from further considering the MED process at the HBGS site. For the same reasons, the MED process is rejected as a feasible alternative to the existing project.

Alternative Project Intake Source Water Collection Systems

The three most common subsurface type intake systems: 1) beach wells; 2) infiltration galleries; and 3) seabed filtration systems could be considered as alternative intake systems for the Seawater Desalination Project at Huntington Beach. These three subsurface intake facilities all have one key advantage over the project: the source water they collect is pretreated via slow filtration through the subsurface sand/seabed formations in the area of source water extraction.

<u>Beach Wells</u>

There are two types of beach wells typically utilized for the intake of seawater: 1) vertical intake wells; and 2) horizontal collector wells (commonly referred to as Ranney wells). Vertical intake wells consist of a non-metallic casting (typically, fiberglass reinforced pipe), well screens, and a stainless steel submersible or vertical turbine pump. The well casting diameter is between six inches and 18 inches, and well depth does not usually exceed 250 feet. The vertical intake wells are usually less costly than the horizontal wells but their yield is relatively small (typically, 0.1 to 1.0 MGD). Horizontal (Ranney) intake wells consist of a caisson that extends below the ground surface with water well collector screens (laterals) projected out horizontally from inside the caisson into the surrounding aquifer (see Figure 7-1, *HORIZONTAL [RANNEY] BEACH WELL*).

Since the laterals in the Ranney wells are placed horizontally, a higher rate of source water collection is possible than with vertical wells. This allows the same intake water quantity to be collected with fewer wells. Individual Ranney wells are typically designed to collect between 0.5 to 5.0 MGD of source water. The caisson is constructed of reinforced concrete that may be between 10 and 30 feet inside diameter with a wall thickness from approximately 1.5 to three feet. These larger capacity intake wells require vertical pumps, which cannot be submersed in water, therefore these vertical pumps must be housed above the high tide line. In addition, the size and servicing of the well pumps, piping, electrical, instrumentation and other auxiliary equipment of large-capacity wells require that the location of the pump house be a minimum of 10 feet above beach grade. The caisson depth varies according to site-specific geologic conditions, ranging from approximately 30 feet to over 150 feet. The number, length and location of the horizontal laterals are determined based on a detailed hydrogeological investigation. Typically the diameter of the laterals ranges from eight to 12 inches and their length extends up to 200 feet. The size of the lateral screens is selected to accommodate the grain-size of the underground soil formation. If necessary, an artificial gravel-pack filter is installed around the screen to suit finer-grained deposits.

In large intake applications, such as that shown on Figure 7-2, *HORIZONTAL (RANNEY) BEACH WELL PHOTO*, the horizontal beach wells are typically coupled with the intake pump station installed above the well caisson. Figure 7-2 shows one of the three 3.8 MGD horizontal (Ranney) intake beach wells (two active intake pumps and one standby pump) for the largest existing seawater desalination facility located on the Pacific Ocean coast in North America – the 3.8 MGD water supply facility for the Pemex Salina Cruz refinery in Mexico.

As stated, vertical intake wells typically have relatively low yields (0.1 to 1.0 MGD) compared to horizontal Ranney wells. The proposed Seawater Desalination Project at Huntington Beach would require approximately 100 MGD of seawater in order to produce the projected 50 MGD of freshwater. Consequently, 100 to 1,000 vertical intake wells (100 MGD/1 MGD = 100 wells to 100 MGD/0.1 MGD = 1000 wells), with an estimated depth of 250 feet each, would be required to supply the necessary source water required for full operation of the facility.

The vertical intake wells would have to be located on the beach, in close vicinity (usually within several hundred feet) of the ocean. For 100 vertical beach wells with an individual capacity of 1 MGD each, and a minimum distance between the individual wells of 200 feet, the footprint of the beach well shoreline area would be 20,000 feet long (200 feet x 100 wells = 20,000 feet) or approximately four miles. The minimum area of shoreline needed for construction of the vertical intake wells would be (100 feet (construction zone) x 20,000 feet = 2,000,000 square feet (46 acres)). The network of wells would also need an extensive piping system in order to link the individual wells with the desalination facility. A feasibility study prepared for a 25 mgd seawater desalination facility in Corpus Christi, Texas, also concluded that vertical intake wells were not a feasible intake alternative because the "significant cost and land requirements make them impractical and economically infeasible."[2]

[2] Large Scale Demonstration Desalination Feasibility Study. City of Corpus Christi, August 2004. This document is available at http://www.cctexas.com/files/g17/LSD%20Report%20Aug%2004%2Epdf.

Figure 7-1
HORIZONTAL (RANNEY) BEACH WELL

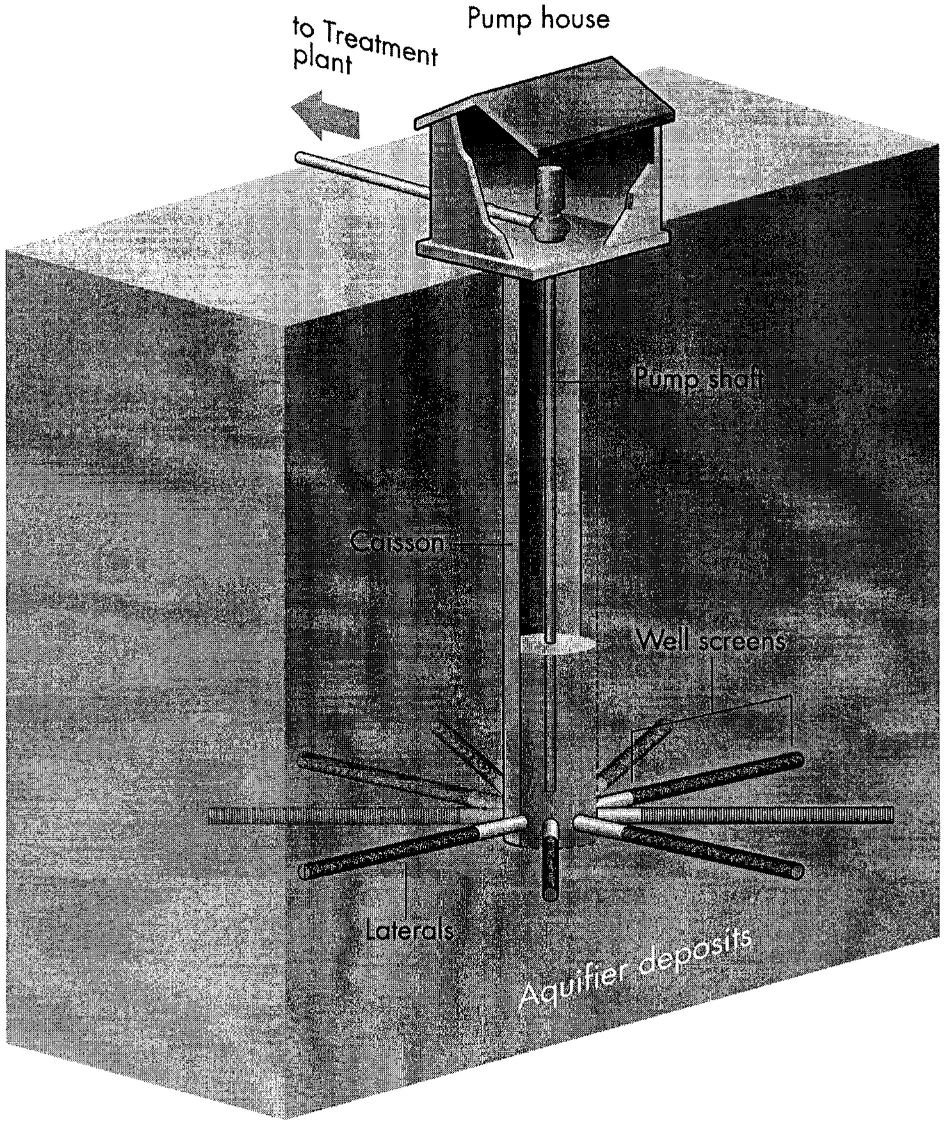
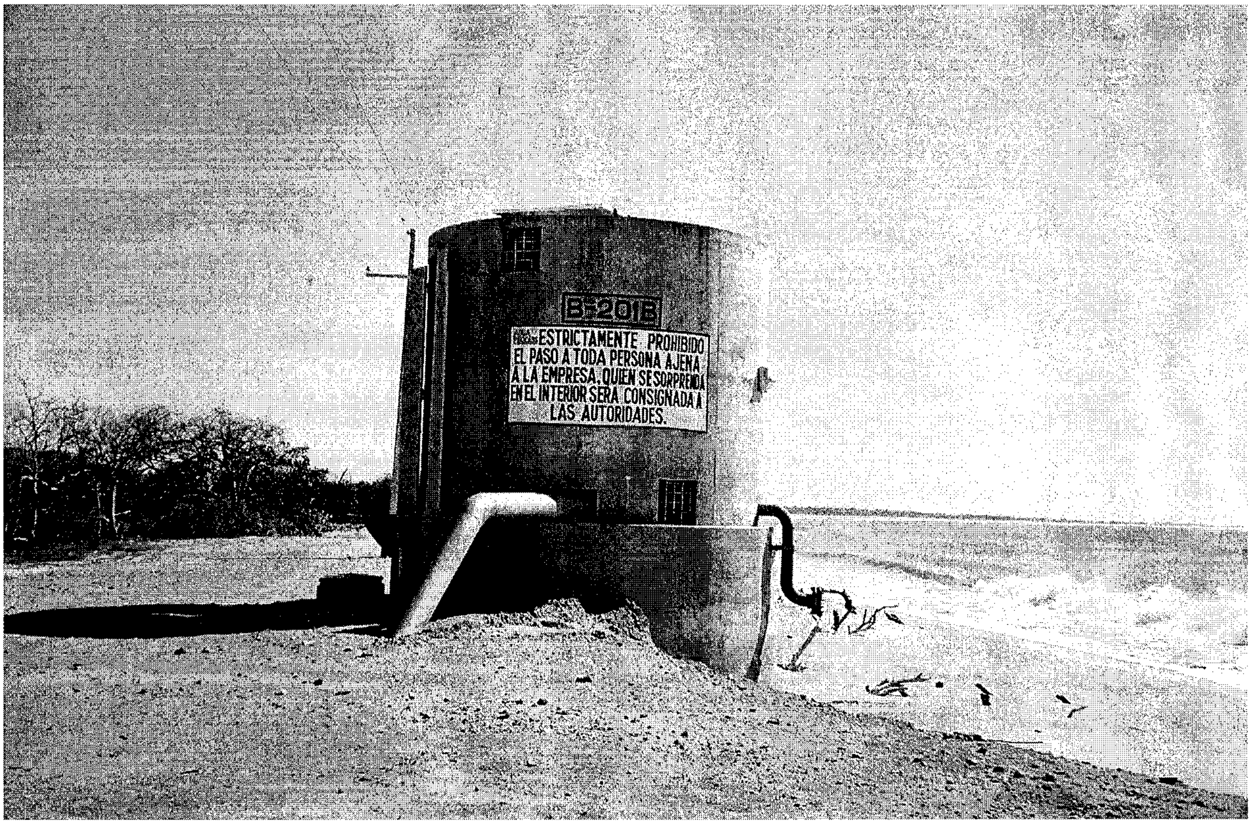


Figure 7-2
HORIZONTAL (RANNEY) BEACH WELL PHOTO



On the other hand, the minimum number of individual horizontal Ranney intake wells required for the site-specific conditions of the project is 24. This number was determined considering: the total intake capacity of the desalination facility is approximately 100 MGD; the hydrogeological conditions are very favorable and therefore an individual well could yield five MGD of intake water; and that an additional 20 percent well standby capacity would be incorporated in the intake system design to account for well capacity decrease over the 30-year period of the useful life of the project and for well downtime due to routine maintenance (100 MGD/5 MGD per well) x 1.2 = 24).

For 24 Ranney wells with an individual capacity of five MGD each, and a minimum distance between the individual wells of 400 feet, the footprint would be 9,600 feet long (400 feet x 24 wells = 9,600 feet (approx. 1.8 miles). The minimum area needed for construction of the horizontal beach wells would be (100 feet [construction zone] x 9,600 feet = 960,000 square feet [22 acres]). Figure 7-3, *HORIZONTAL (RANNEY) BEACH WELL SYSTEM ILLUSTRATION*, shows the approximate size and configuration of a horizontal intake well system for a 10 MGD seawater desalination facility with five intake wells. Figure 7-4, *CONCEPTUAL HORIZONTAL (RANNEY) WELL INTAKE CONFIGURATION AT HUNTINGTON BEACH,* gives a general representation of the shoreline area in front of HBGS that would be impacted by the construction of a Ranney well intake system. The portion of the seashore shown in the figure is approximately 3,000 feet long; as discussed previously, total length of shoreline that would be required would be approximately 1.8 miles. The network of wells would also need an extensive piping system in order to link the individual wells with the desalination facility.

Figure 7-3
HORIZONTAL (RANNEY) BEACH WELL SYSTEM ILLUSTRATION

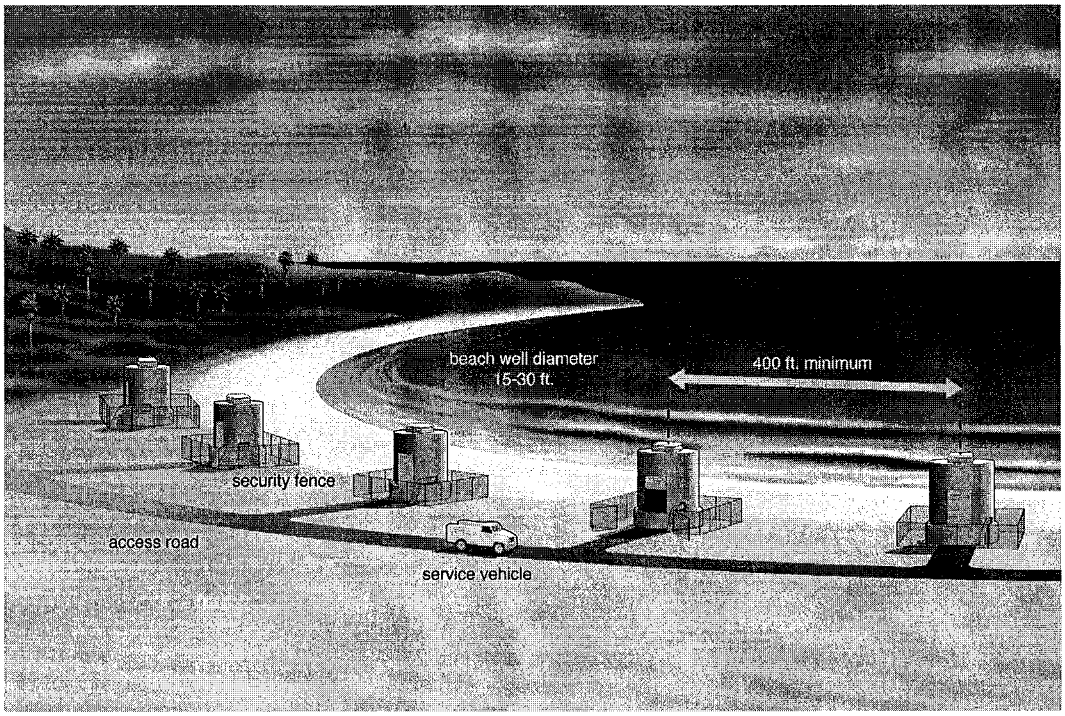
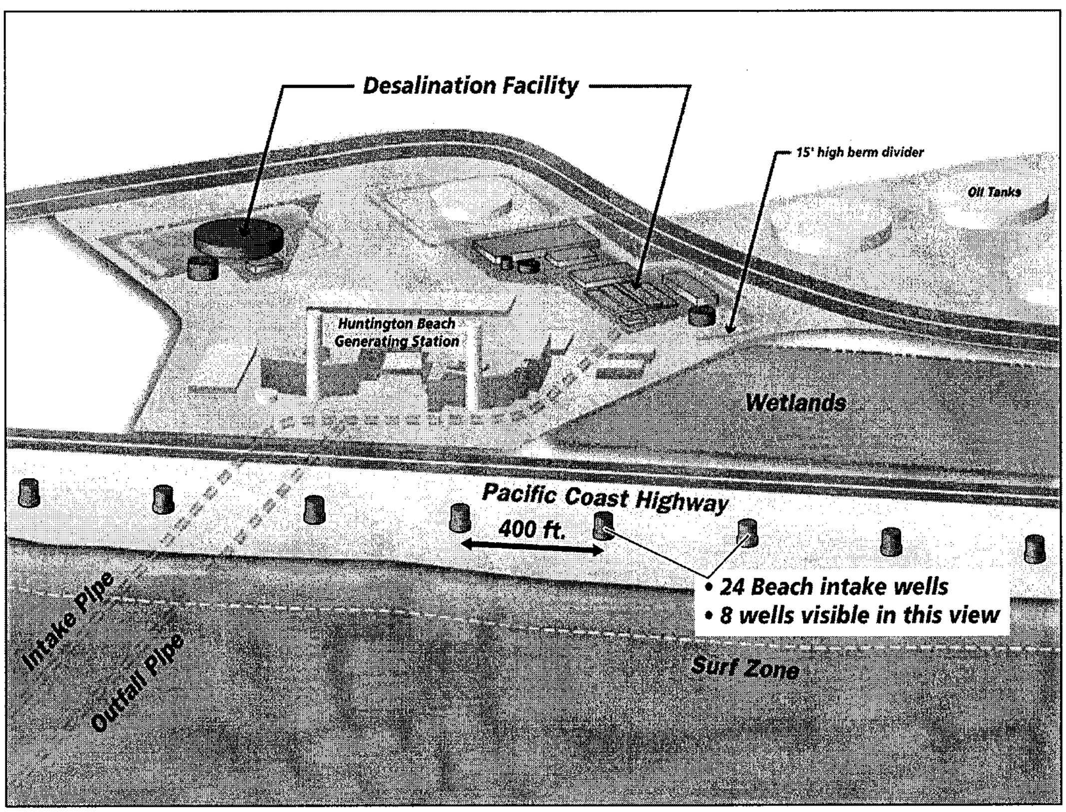


Figure 7-4
CONCEPTUAL HORIZONTAL (RANNEY) WELL INTAKE CONFIGURATION AT HUNTINGTON BEACH



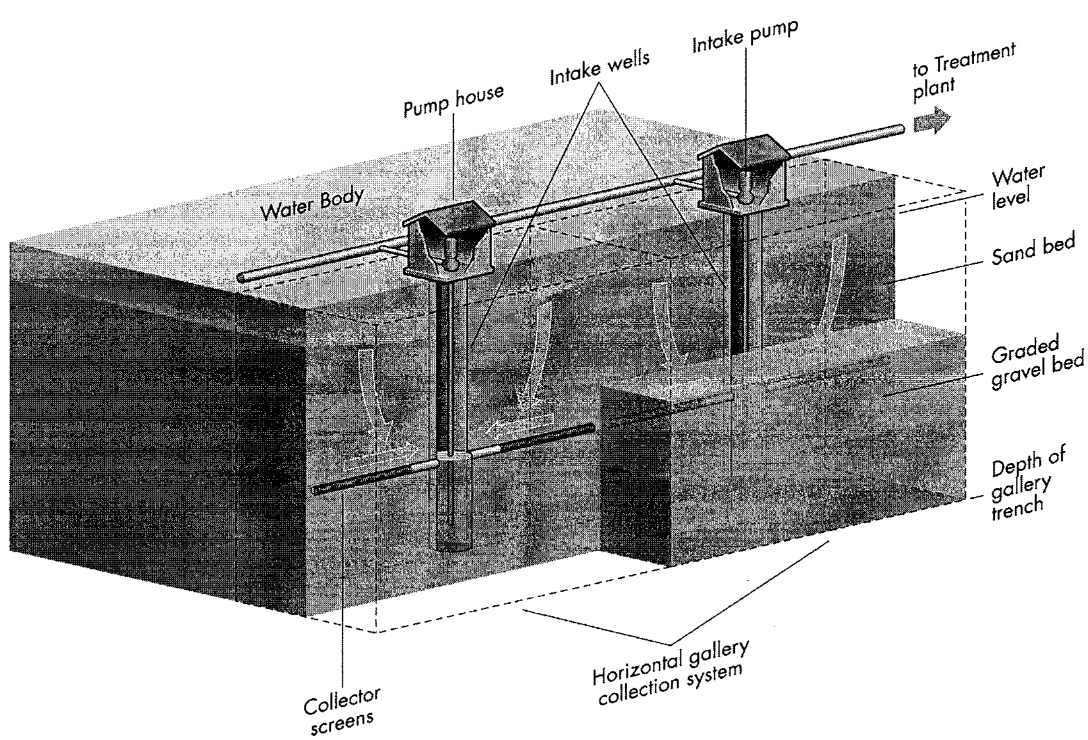
Ranney beach well drilling techniques do allow for the placement of wells further inland (e.g. away from the beach in a developed area), thus moving aesthetic and recreational impacts from the beach to inland uses. Regardless, the number of wells necessary for a 50 mgd desalination facility limit the feasibility of utilizing wells for a large-scale project.

Infiltration Galleries

Infiltration galleries are typically implemented when conventional horizontal or vertical intake wells cannot be used due to unfavorable hydrogeological conditions. For example, they are suitable for intakes where the permeability of the underground soil formation is relatively low, or in the case of river or seashore bank filtration, where the thickness of the beach or the onshore sediments is insufficient to develop conventional intake wells.

Infiltration galleries consist of an excavated trench that is filled with filtration media of size and depth similar to that of the granular media filters used for conventional water treatment plants. Vertical or horizontal collector wells are installed in equidistance (usually 100–200 feet) inside the filter media. Typically the capacity of a single collection well is 0.2–2.5 MGD. The most common type of infiltration gallery is a horizontal well collection system with a single trench (refer to Figure 7-5, *INFILTRATION GALLERY*). The media in the infiltration gallery is configured in three distinctive layers: a bottom layer of sand media of approximately three to six feet, followed by a four to six foot layer of graded gravel pack surrounding the horizontal well collector screens; topped by a 20- to 30-foot layer of sand. The horizontal well collector screens are typically designed for inflow velocity of 0.1 feet per second or less.

Figure 7-5
INFILTRATION GALLERY



The infiltration galleries could be designed either similar to conventional rapid sand filters (if the natural ocean water wave motion can provide adequate backflushing of the infiltration gallery media) or could be constructed as slow sand filtration systems, which have at least a 30-feet layer of sand overlying the collection well screens.

For the site-specific conditions of the proposed Seawater Desalination Project at Huntington Beach, the minimum number of individual collection wells required for the gallery is 48. This number was determined considering: the total intake capacity of the desalination facility is approximately 100 MGD; the hydrogeological conditions allow the individual well to yield 2.5 MGD of intake water; and that an additional 20 percent well standby capacity is incorporated in the intake system design to account for well capacity decrease over the 30-year period of the useful life of the project and for well downtime due to routine maintenance ([100 MGD/2.5 MGD per well] x 1.2 = 48 individual collection wells).

The infiltration gallery wells have to be located on the seashore, in close vicinity (usually within several hundred feet) of the ocean. For 48 collection wells of individual capacity of 2.5 MGD, and a minimum distance between the individual wells of 200 feet, the footprint of the beach well shoreline area would be 9,600 feet long (200 feet x 48 wells = 9,600 feet), or approximately 1.8 miles. The minimum area of shoreline needed for construction of the horizontal beach would be (100 feet [construction zone] x 9,600 feet = 960,000 square feet, or 22 acres). The network of wells would also need an extensive piping system in order to link the individual wells with the desalination facility. A feasibility study prepared for a 25 mgd seawater desalination facility in Corpus Christi, Texas, also concluded that horizontal infiltration galleries were not a feasible intake alternative because the "significant cost and land requirements make them impractical and economically infeasible."[3]

Seabed Filtration System

Seabed filtration intake systems consist of a submerged slow sand media filtration system located at the bottom of the ocean in the near-shore surf zone, which is connected to a series of intake wells (see discussion on vertical and horizontal intake wells above) located on the shore (see Figure 7-6, *SEABED INFILTRATION SYSTEM*).

Seabed filter beds are sized and configured using the same design criteria as slow sand filters. The design surface loading rate of the filter media is typically between 0.05 - 0.10 gpm/square foot. Approximately one inch of sand is removed form the surface of the filter bed every six to 12 months for a period of three years, after which the removed sand is replaced with new sand to its original depth. As seen in Figure 7-6, the ocean floor has to be excavated to install the intake piping of the wells. These pipes are buried at the bottom of the ocean floor excavation pit (see Figure 7-7, *SEABED INFILTRATION SYSTEM CROSS-SECTION*).

Currently, there are no existing large seawater desalination facilities (with capacity over five MGD) using seabed filtration intake systems. The largest seawater desalination facility with a seabed filtration intake system currently under construction is the 13.2 MGD Fukuoka District RO facility in Japan. This plant is planned to be operational in late 2005. The Fukuoka seawater desalination facility seabed intake area is 312,000 square feet.

3 Large Scale Demonstration Desalination Feasibility Study. City of Corpus Christi, August 2004. This document is available at http://www.cctexas.com/files/g17/LSD%20Report%20Aug%2004%2Epdf.

Figure 7-6
SEABED INFILTRATION SYSTEM

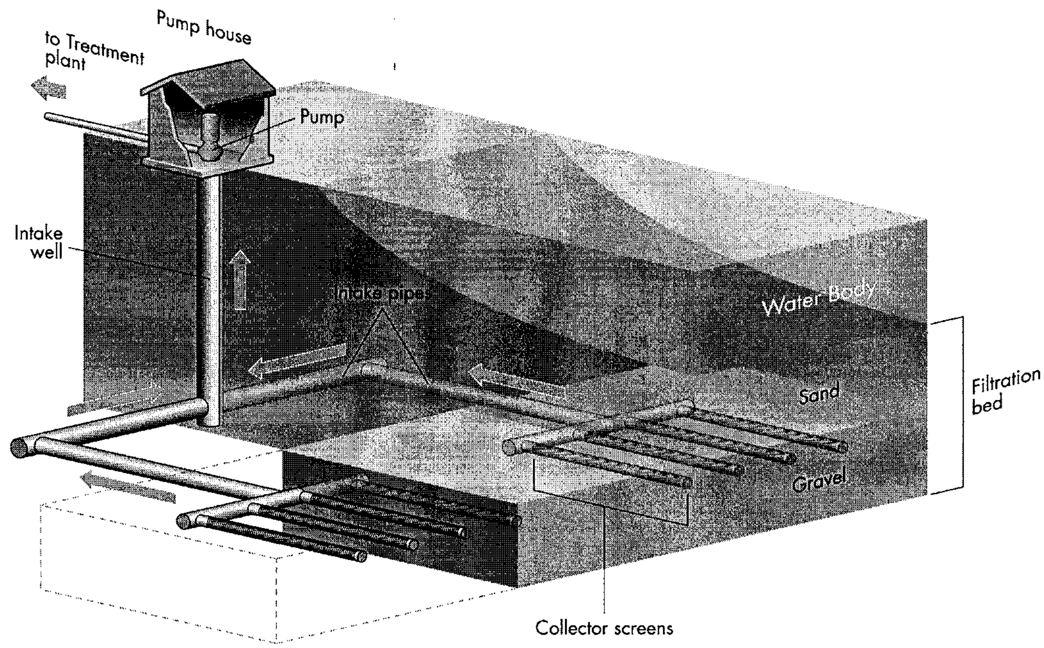
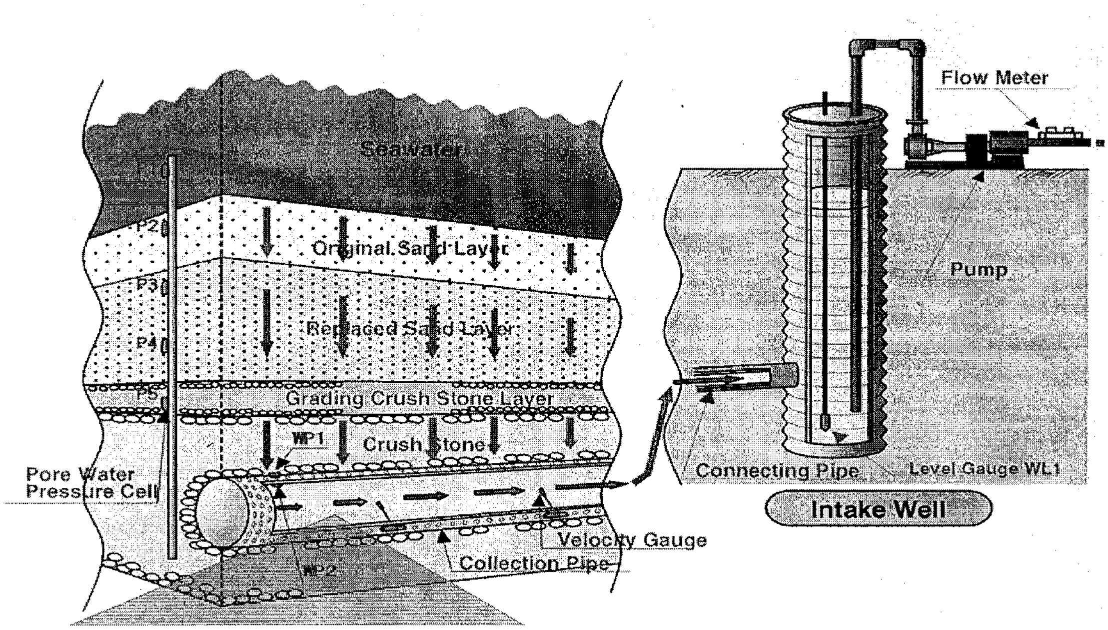
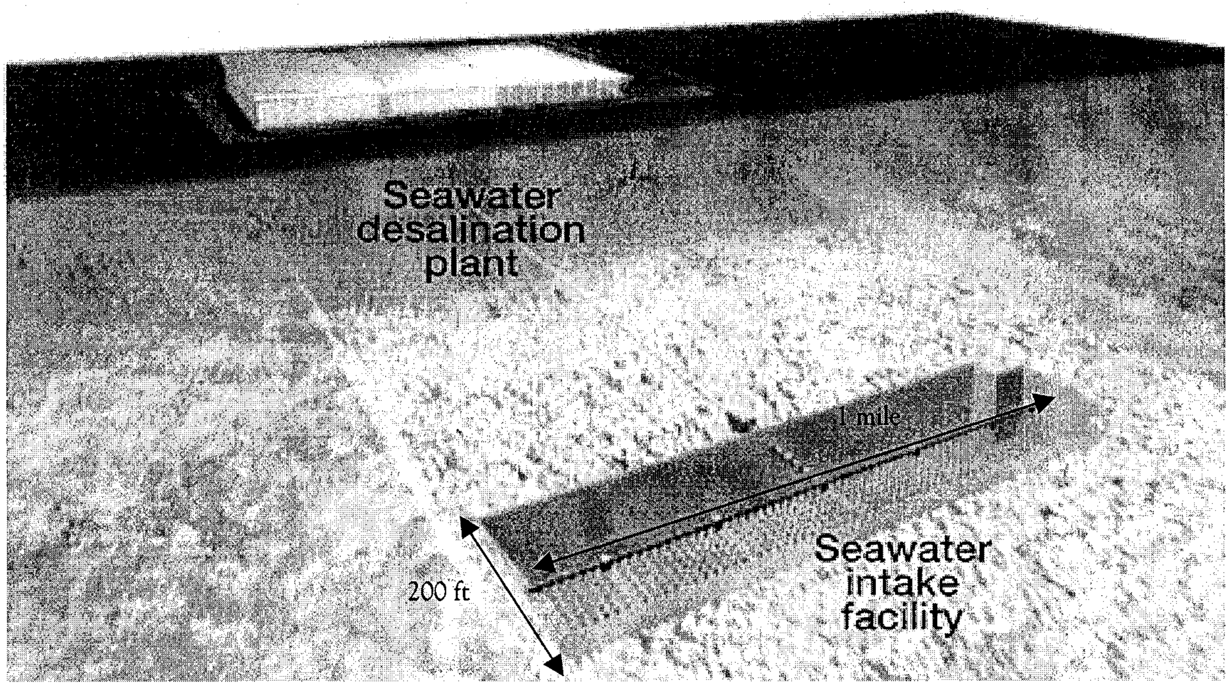


Figure 7-7
SEABED INFILTRATION SYSTEM CROSS-SECTION



For the source water intake feed rate of 100 MGD (70,000 gpm) needed for the Seawater Desalination Project at Huntington Beach, and a typical seabed design surface loading rate of 0.07 gpm/square foot, the total area of the ocean floor needed to be excavated to build a seabed intake system of adequate size is 23 acres (70,000 gpm/0.07 gpm per square foot = 1,000,000 square feet = 23 acres). Assuming that the seabed is 200 feet wide (a typical length for a collector screen), this translates to an impact on the ocean floor of approximately one linear mile (1,000,000 square feet /200 feet = 5,000 feet) (see Figure 7-8, *SEABED INFILTRATION SYSTEM APPROXIMATE IMPACT AREA*). The network of wells would also need an extensive piping system in order to link the individual wells with the desalination facility.

Figure 7-8
SEABED INFILRATION SYSTEM APPROXIMATE IMPACT AREA



Alternative Intake System Environmental Analysis

All intake system alternatives reviewed above would extract the seawater supply by slowly withdrawing the water from the surrounding sand. Water velocity at the seawater/sand interface would be negligible. Since the seawater is filtered through the sand, there would be no entrainment of marine organisms.

Beach well water typically has a very low dissolved oxygen (DO) concentration. The DO concentration of this water is usually less than two mg/l, and it often varies between 0.2 and 1.5 mg/L. The RO treatment process does not add an appreciable amount of DO to the intake water. Therefore, the RO system product water and concentrated seawater to be discharged have the same DO concentration as the source water. The low DO concentration in the product water would require either product water re-aeration or would result in significant use of chlorine. In addition, the low DO concentration in the discharge would not be in compliance with the EPA's daily average and minimum DO concentration discharge requirements of four mg/L and five mg/L, respectively. In comparison, the project discharge would have a DO concentration of five to eight mg/L, and would be in compliance with the California State Water Resources Control. Board Ocean Plan regulations and in turn would comply with all EPA requirements.

The discharge water resulting from a beach well intake alternative could cause oxygen depletion and significant stress to aquatic life. The discharge water would have to be re-aerated before it was released into the ocean. For a desalination facility of the size of the proposed project, the amount of air and energy to increase the DO concentration of the discharge from one mg/L to four mg/L would be significant and would have a measurable effect on potable water production costs. Discharge of this low DO concentrate to a wastewater treatment facility would also result in significant additional power use to aerate this concentrate prior to discharge.

Construction of any of the alternative intake well facilities necessary to support the project would require the disruption of coastal areas within Huntington Beach and would temporarily impact coastal and marine biological resources in the site vicinity. The beach excavation required for any alternative intake system has the potential to negatively impact shore birds, marine mammals, and intertidal organisms in the area of the construction. Although opportunities may exist to construct Ranney wells away from the beach (further inland), the construction of approximately 24 well sites within coastal communities would create substantial construction and long-term (land use, aesthetic, energy) operational impacts. Obtaining construction permits and easements would be a formidable task due to the sensitive nature of this location. In addition, in the case of the seabed filtration intake system, excavation of a 23 acre/one-mile long by 200-foot wide strip of the ocean floor in the surf zone to install a seabed filter system of adequate size to supply the desalination facility would result in a significant impact on the benthic marine organisms in this location (Figure 7-8). The entire benthic ecosystem in the area covered by the seabed filter would be removed as part of the excavation process. The material removed would require disposal elsewhere, thus creating additional environmental impacts. The dredging of the sea floor and establishment of a layer filter bed would disrupt normal public use of the beach and surf zone in this area during construction and the periodic replacement of the layered filter media.

Furthermore, construction activities for the alternative subsurface intake systems would cause temporary disruption to local tourist and public use of the beach. The movements of materials and equipment needed for the project would restrict road traffic. The aesthetic and noise impacts of construction activities, as well as a probable reduction in public access to the area, would negatively impact businesses in the vicinity of the construction. The pipeline network necessary to link the intake well system with the desalination facility would be extensive and would require beach shoreline excavation, trenching and subsequent burial of the system.

After the completion of construction, the presence of the structures necessary to house the pumps and other equipment needed for the operation of an alternative beach well intake system would cause additional impacts (primarily aesthetic). The wells and appurtenances would permanently and negatively alter the aesthetic characteristics of the beach shoreline (access roads, fences, electrical supply equipment, etc.).

Although the above-grade pump house could be designed in virtually any architectural style, these facilities and the necessary service roads would change the visual landscape of the seashore (see Figure 7-3). Taking into consideration that the desalination facility intake equipment and source water must be protected from acts of vandalism and terrorism, the individual beach wells would have to be fenced-off or otherwise protected from unauthorized access. The large and tall fenced-off beach well concrete structures would have a limited aesthetic appeal. Since the City of Huntington Beach public beaches are visually sensitive areas, the installation of large beach wells would affect recreation and tourism, and would negatively alter beach appearance and character (see Figure 7-3).

None of these potential environmental impacts are associated with the use of the cooling water system from the existing HBGS as source water for the project. The proposed intake system would not alter the operations of the HBGS intake or discharge system, and it would provide a more than adequate supply of source water. None of the proposed alternative intake systems would be an acceptable substitute to the proposed use of the existing HBGS cooling water system as the supplier of source water for the Seawater Desalination Project at Huntington Beach.

Alternative Project Discharge

Alternative Project Discharge Location

The only existing ocean discharge facility (besides the HBGS outfall) in the project site vicinity is the 120-inch, 4.5-mile ocean outfall utilized at the OCSD regional wastewater treatment facility (located approximately 1.5 miles southeast of the proposed project site). The City inquired with OCSD regarding the feasibility of discharging the proposed desalination project's concentrated seawater discharge (50 mgd) through the OCSD's outfall. In a response letter dated June 24, 2004, OCSD indicated that, based on hydraulic discharge capacity performed for the OCSD's 1999 Strategic Plan, capacity within the OCSD outfall is not available for the proposed desalination project. Analysis of future wastewater projections shows that the capacity of the 120-inch outfall is anticipated to be exceeded once every three years by the year 2020, requiring the use of the District's emergency one-mile ocean outfall.[4] As such, the use of the OCSD outfall for concentrated seawater discharge is not considered a feasible alternative to the proposed project.

Alternative Project Discharge Design - Diffuser

All hydrodynamic analysis performed for the EIR is based on the proposed project utilizing the existing HBGS outfall infrastructure. The analysis determines the dilution and dispersion of the concentrated sea salts that would be added to the discharge stream by the proposed desalination facility, which is discussed throughout this document as the proposed project. Yet, another outfall alternative would be to install a diffuser on the existing discharge tower.

The most practical diffuser concept is a velocity cap retrofitted to the discharge tower, identical to the one that already exists on the infall tower. A velocity cap would provide four lateral diffuser ports with rectangular cross section, producing four horizontal discharge jets (assuming the jets are oriented in the cross-shore and along shore directions, parallel to the walls of the discharge tower). As a worst case scenario, the velocity cap diffuser would cause faster dilution of the sea salts in the water column beyond 600 feet from the outfall, but would result in higher salinities on the seafloor within 600 feet from the outfall. As further described in Appendix W, *SUPPLEMENTAL REPORT ON THE EFFECTS OF A RETROFITTED DIFFUSER ON THE DISCHARGE OUTFALL FOR THE PROPOSED SEAWATER DESALINATION PROJECT AT HUNTINGTON BEACH,* the diffuser would increase maximum seabed salinity at the base of the outfall from 48.3 ppt to 50.0 ppt for the Low-Flow event scenario, and the benthic area experiencing a 10 percent increase in salinity or more would increase from 15.6 acres to 24.5 acres. Higher bottom salinities with the diffuser is caused by the horizontal diffuser jets permitting only the lower half of the water column to engage in the dilution volume of the heavy discharge.

A diffuser would provide an increased dilution factor at the shoreline, but a diffuser would also increase the seabed salinity within 600 feet of the outfall because only half of the water column would be engaged for dilution and because discharge configuration ejects the concentrated seawater away from the seabed. Thus, the proposed project's current outfall configuration allows for a more rapid dilution of the concentrated sea salts than the diffuser.

[4] Letter, Jim Herberg, P.E., Orange County Sanitation District, June 24, 2004.

7.5 "REDUCED FACILITY SIZE" ALTERNATIVE

The proposed desalination project is currently designed to incorporate reverse osmosis (RO) technology to remove impurities from seawater to produce approximately 50 mgd (56,000 AFY) of potable water for distribution to local water agencies. One alternative to the proposed project would be to reduce the output of project water to approximately 25 mgd. The design and operation of the proposed desalination facility would generally remain the same. However, this alternative would reduce the size of the facility, the amount of seawater required to produce water, and the amount of concentrated seawater discharged back into the HBGS outfall.

The 25 mgd alternative would not significantly reduce potential environmental impacts when compared to the proposed project. In addition, this alternative would result in a substantial decrease in the amount of desalinated water that could be produced, and thus a substantial increase in the cost of the desalinated water. Consequently, the 25 mgd alternative would not achieve the project objectives to provide a sufficient amount of water that would meet the future water needs projected by Orange County water purveyors, and would reduce overall water supply reliability that is sustainable and independent of climatic conditions. A discussion of potential impacts is discussed below.

Land Use/Relevant Planning

Potential impacts in regards to land use/relevant planning would be similar to the proposed project, because the desalination facility location and general layout would not change substantially. The zoning requirements would not change. A 25 mgd facility would use three to four acres less area than a 50 mgd facility. The height and architectural profile of all key buildings and other structures (storage tanks, pump stations, etc.) would remain the same. Facility capacity reduction would only impact the footprint of the buildings, and would not affect their appearance.

Geology and Soils

Geology and soils impacts would be very similar to those of a 50 mgd facility because the depth of the facilities and associated excavation activities would not change with facility capacity reduction. Grading would be similar in both cases because of the need to remove the existing unused fuel oil storage tanks. However, because of overall reduction of the facility footprint, the construction of a 25 mgd facility as compared to a 50 mgd facility would require approximately 30 percent less earthwork and soil transportation, which in turn would result in reduction of the number of construction truck trips and traffic. Construction traffic is temporary in nature, and the difference between this alternative and the proposed project is not anticipated to be significant.

Hydrology, Drainage and Storm Water Runoff

The proposed project and the Reduced Facility Size alternative would have similar impacts in regards to hydrology, drainage, and storm water runoff. Both projects would incorporate an on-site drainage system to properly dispose of runoff. Although the Reduced Facility Size alternative would have a footprint approximately 30 percent smaller than the proposed project, impacts in this regard are not anticipated to substantially differ from the proposed project.

Air Quality

Long-term air quality impacts resulting from the Reduced Facility Size alternative would be slightly lower than the proposed project. As the project would produce a smaller amount of product water, less electrical energy would be necessary to operate on-site desalination facilities and off-site product water pump stations. In addition, employee and truck delivery operations may be reduced, thus resulting in slightly lower mobile air emissions. However, as the number of employee/truck trips would be negligible under either scenario, and both the proposed project and Reduced Facility Size alternative would be subject to the Regional Clean Air Incentives Market (RECLAIM), no substantial difference in impacts is anticipated.

Noise

Impacts in regards to noise are anticipated to be slightly reduced in comparison to those of the proposed project. As stated above, the design and operation of the proposed desalination facility would generally remain the same, but with a reduced amount of noise-generating equipment. It is anticipated that the same noise-generating equipment (pumps, compressors, etc.) and noise attenuation measures would be incorporated for the 25 mgd alternative. In addition, the level of noise generated by mobile sources (automobiles driven by on-site employees, delivery trucks) would not substantially change, as the facility operations would generally remain the same.

Public Services and Utilities

Implementing a 25 mgd desalination facility is anticipated to have similar impacts in regards to public services and utilities as the proposed project site. As stated above, the design and operation of the proposed desalination facility would generally remain the same. In addition, impacts to public services and utilities such as police/fire service, solid waste, sewer, drainage, and electricity would not vary significantly from the proposed 50 mgd project.

Aesthetics/Light & Glare

As stated above, the design and operation of the proposed desalination facility would generally remain the same. It is expected that potential impacts in regards to aesthetics, light, and glare on a 25 mgd alternative would be similar in nature to the proposed 50 mgd project implementation.

Hazards and Hazardous Materials

Impacts in regards to hazards and hazardous materials are anticipated to be similar to those of the proposed project. The same types of hazardous materials would be required for operation of a Reduced Facility Size alternative. The nature in which hazardous materials would be stored, handled, and used for project operation is not expected to change for the 25 mgd alternative implementation.

Construction Related Impacts

Implementation of the Reduced Facility Size alternative would result in slightly reduced construction-related impacts in comparison to the proposed project (primarily at the proposed desalination facility site). At the desalination facility site (which would be reduced in size by approximately 30 percent), impacts in regards to hydrology/drainage/storm water runoff, air quality, noise, and traffic would be incrementally reduced due to lower amounts of on-site grading, import/export haul trips and employee worker trips. As construction for the off-site booster pump stations and pipelines would not vary considerably for smaller product water pipelines and pump stations, impacts are anticipated to be similar to the proposed project. It is not anticipated that implementation of the Reduced Facility Size alternative would reduce the unavoidable significant impact in regards to construction-related NO_x to a less than significant level.

Ocean Water Quality and Marine Biological Resources

Like the proposed project, the 25 mgd alternative would not change the required flows or operation of the HBGS cooling water system. The impact of the proposed project (50 mgd facility) on ocean water quality and marine life has been found to be less than significant (refer to Section 5.10, *OCEAN WATER QUALITY AND MARINE BIOLOGICAL RESOURCES*). Construction of a 25 mgd facility as an alternative to a 50 mgd facility is not anticipated to result in a measurable difference in impacts to the ocean environment surrounding the HBGS outfall. The radius of the zone of initial dilution is likely to be incrementally reduced. As a result, impacts in regards to ocean water quality and marine biological resources are anticipated to be slightly reduced in comparison to the proposed project.

Product Water Quality

The product water quality of the 25 mgd desalination facility would be the same as that of a 50 mgd facility. Identical chemical conditioning and corrosion control and monitoring would be implemented. Therefore, a reduction in the size of the proposed project would have no adverse effect on the product water quality. System integration of desalinated water with the existing potable water distribution system of Orange County would be the same for both 25 and 50 mgd projects. However, one of the benefits of the proposed project (a reduction in the overall salt content of existing potable water in Orange County through the introduction of desalinated water) would be reduced if the product water output of the project were reduced to 25 mgd.

Conclusion

While the Reduced Facility Size alternative may result in slightly reduced impacts in comparison to the proposed project, the 25 mgd alternative would result in providing water at a cost that would not be acceptable to Orange County water purveyors, and would not produce a sufficient amount of desalinated water to meet projected future demand. Implementation of the 25 mgd alternative would not avoid the project's identified unavoidable construction related air quality impact, and would reduce the water quality benefits of the project as proposed. As such, this alternative is not presently under consideration.

7.6 "ENVIRONMENTALLY SUPERIOR" ALTERNATIVE

None of the above alternatives are considered "environmentally superior" to the proposed project, except for the "No Project" Alternative. In this case, CEQA requires identification of an "environmentally superior" alternative from among the other alternatives. Implementation of the project on an alternative site, while dependent on site-specific variables, is not anticipated to significantly reduce impacts, as alternative site implementation is expected to result in overall similar or greater environmental impacts. The "Alternative Ownership" alternative would result in exactly the same environmental impacts as the proposed project. A hypothetical reduction in facility size can be argued to be "environmentally superior", based superficially on the reduction in facility size and corresponding reduction in traffic, air and noise impacts. However, reducing facility size and output would not substantially reduce any significant impacts. The other alternative project design alternatives (alternative desalination methods and alternative intake facilities), while offering some environmental benefits, result in greater environmental impacts overall. Consequently, and in accordance with the mandate of CEQA, the "Alternative Project Design – Reduced Facility Size" alternative is selected as the environmentally superior alternative in comparison to the proposed project.