3.0 PROJECT DESCRIPTION

3.0 PROJECT DESCRIPTION

3.1 PROJECT LOCATION

The proposed Poseidon Seawater Desalination Project site is approximately seven acres in size and is located in the southeastern portion of the City of Huntington Beach at 21652 Newland Street. The City of Huntington Beach is a coastal city along the Pacific Ocean in northwestern Orange County. It is surrounded by the City of Westminster to the north, City of Fountain Valley to the northeast, Cities of Costa Mesa and Newport Beach to the east, and the City of Seal Beach to the northwest. Los Angeles is located approximately 35 miles to the northwest while San Diego is 95 miles to the southeast (refer to Exhibit 1, *REGIONAL VICINITY MAP*). The site is bordered by a fuel oil storage tank to the north, the Orange County Flood Control District (OCFCD) flood channel to the east, AES Huntington Beach Generating Station facilities to the southwest, a wetland area to the southeast, and an electrical switchyard to the west (refer to Exhibit 2, *SITE VICINITY MAP*).

3.2 ENVIRONMENTAL SETTING

The approximately seven-acre subject site is situated on a fuel storage tank area formerly owned and operated by Southern California Edison (SCE). AES Huntington Beach, LLC recently acquired the property, and, upon project implementation, would lease a portion of the property to the Poseidon Resources Corporation. The storage tank area contains a total of six tanks, ranging in capacity from 924,000 gallons to 8.64 million gallons. Implementation of the proposed project would require the demolition of three of the six tanks (two fuel oil tanks and one distillate fuel tank). The two fuel oil storage tanks to be demolished have historically been referred to as the "South" and "East" fuel oil storage tanks (refer to Exhibit 2, *SITE VICINITY MAP* for the precise location). The six storage tanks are cylindrical in shape and are surrounded by 10 to 15-foot high earthen containment berms, pipelines, pumps, and associated structures. On-site vegetation consists mainly of non-native low-lying shrubs and bushes along the eastern border of the project site. The topography of the site is relatively flat, gently sloping to the southwest, with an elevation of approximately five feet above mean sea level (msl).

In addition to the desalination facility site (refer to Exhibit 3, *CONCEPTUAL SITE PLAN*), the proposed project will also include several related off-site improvements, including pipelines between the existing AES ocean intake/outfall lines and the proposed desalination project, up to approximately 10 miles of water delivery pipeline, an optional aboveground storage tank, and a new underground pump station. The intake/discharge pipelines would be located entirely within the existing AES power plant site, and would not require modifications to the coastal/marine portions of the existing AES ocean intake/discharge facilities. The water delivery pipeline would be up to approximately ten miles in length, extending from the proposed desalination facility to the OC-44 water transmission line within the City of Costa Mesa, east of State Route 55 (SR-55) at the intersection of Del Mar Avenue and Elden Avenue. The majority of the pipeline alignment will occur within existing public streets, easements, or other rights-of-way (ROW) in urbanized areas. Although precise pipeline alignments may be modified during final engineering analyses, the conceptual pipeline alignments are shown in Exhibit 4, *CONCEPTUAL PIPELINE ALIGNMENTS*. The new off-site underground booster pump station is proposed to be located within an unincorporated area of the County of Orange, within an existing easement (refer to Exhibit 5, *BOOSTER PUMP STATION LOCATION MAP*). The underground pump station would be placed in a subsurface utility vault, bordered by residential uses and natural vegetation.

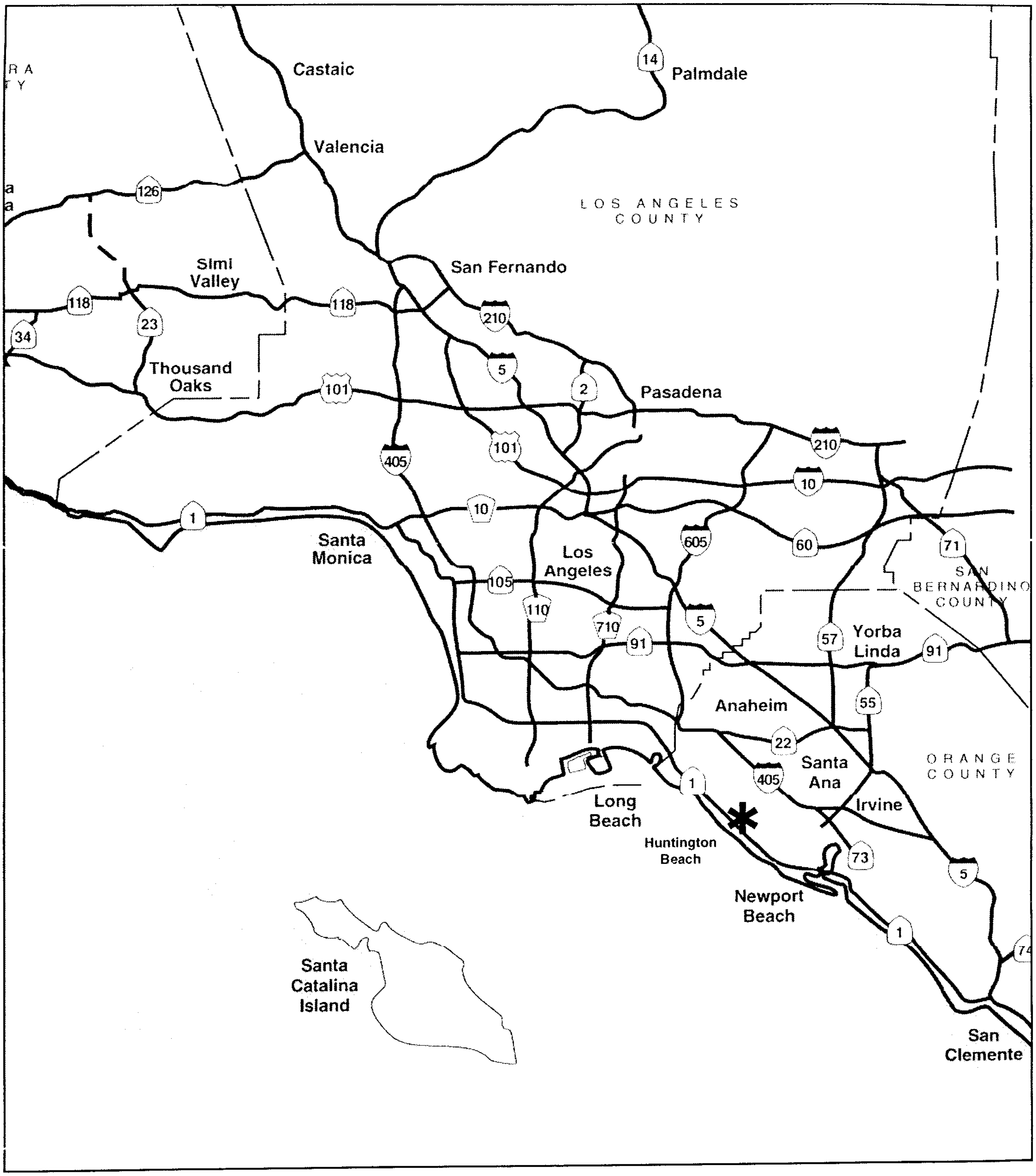
Surrounding Land Uses. Surrounding adjacent land uses include the AES Huntington Beach Generating Station (HBGS) to the southwest, a wetland area to the southeast, the Orange County Flood Control District (OCFCD) flood channel to the east, a fuel oil storage tank to the north, and an electrical switchyard to the west. Additional surrounding land uses include Pacific Coast Highway to the south; the Edison Pipeline and Terminal Company (EPTC) storage tank facility to the east; Ascon/Nesi Landfill to the northeast; commercial, industrial, recreational, and residential uses to the north; and Newland Street, Huntington-By-The-Sea Mobile Home Park, and Cabrillo Mobile Home Park to the west. Uses surrounding the AES intake/discharge pipeline connections consist of various power plant uses and parking areas. Uses surrounding the proposed pipeline route are dependent upon the pipeline alignment selected, although these include primarily residential areas, with some commercial/industrial uses, schools, Fairview Developmental Center, parks, and flood control facilities.

Land Use/Planning. The City of Huntington Beach General Plan designates the proposed project site as "Public (P)". Typical permitted uses within areas of this designation include governmental administrative and related facilities, such as utilities, schools, public parking lots, infrastructure, religious, and similar uses. The project site is zoned as "General Industrial with Oil, Coastal Zone, and Flood Plain Overlays (IG-O-CZ-FP2)". This district provides for the full range of manufacturing, industrial processing, resource and energy production, general service, distribution, and utilities. Proposed off-site facilities would be located primarily within existing public streets or easements, and would border a wide range of land use designations as noted above and as shown in Exhibit 2, *SITE VICINITY MAP,* Exhibit 4, *CONCEPTUAL PIPELINE ALIGNMENTS*, and Exhibit 5, *BOOSTER PUMP STATION LOCATION MAP*. The Poseidon Seawater Desalination Project is a permitted use.

3.3 BACKGROUND AND HISTORY

Previous Use of the Site

The proposed project site exists within a fuel oil storage tank facility constructed in 1961. This tank facility provided a fuel source for the SCE Huntington Beach Generating Station (now owned by AES Huntington Beach, LLC), which began operating in 1958. By the late 1980's, the SCE Generating Station was utilizing primarily natural gas as a fuel source for electric energy generation. Although fuel oils were no longer necessary for operation of the generating plant, SCE was required to maintain a back-up fuel source, and the storage of fuel oils at the tank facility continued. SCE then received notice from the California Independent Systems Operator (ISO) that back-up fuel supplies were no longer necessary, thus eliminating the need for the storage tanks associated with the generating plant. In May 2001, AES Huntington Beach, LLC, owner of the Huntington Beach Generating Station, acquired ownership of the fuel oil storage tank area from SCE.



✱ - Subject Site

Not to Scale

POSEIDON SEAWATER DESALINATION PROJECT

Regional Vicinity Map

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Exhibit 1

1 - AES Property
2 - Edison Storage Tank Facility
3 - Ascon/Nesi Landfill
4 - Edison High School
5 - Edison Community Center/Cannery Street Landfill (Closed)
6 - Mobile Home Parks
7 - Open Space/Wetlands
8 - Project Site
9 - Distillate Fuel Storage Tank
10 - South Fuel Oil Storage Tank
11 - East Fuel Oil Storage Tank
12 - West Fuel Oil Storage Tank
13 - North Fuel Oil Storage Tank

POSEIDON SEAWATER DESALINATION PROJECT

Site Vicinity Map

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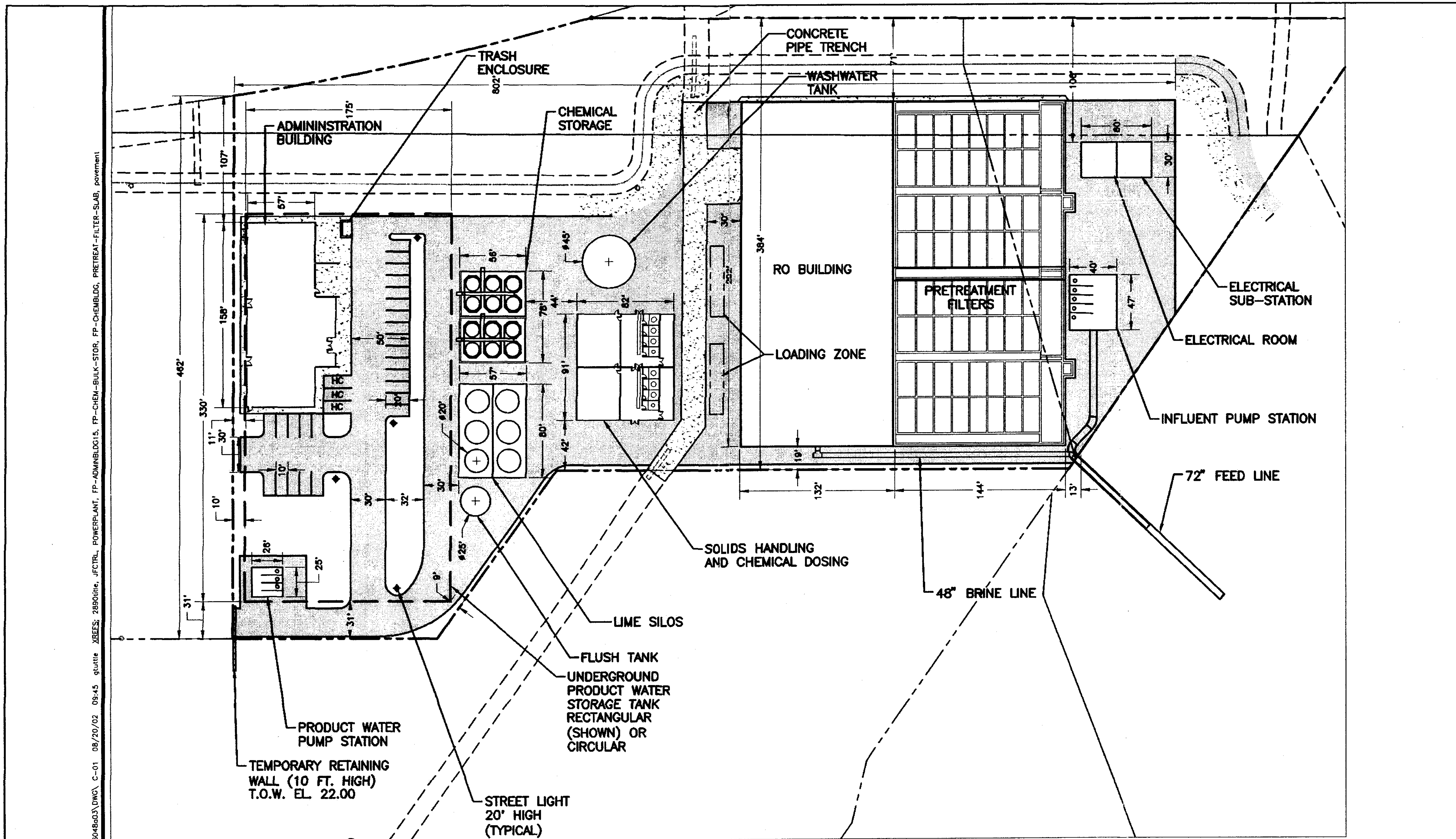
Exhibit 2



Source: Poseidon Resources Corporation, April 2002.

Not to Scale

POSEIDON SEAWATER DESALINATION PROJECT

Conceptual Site Plan

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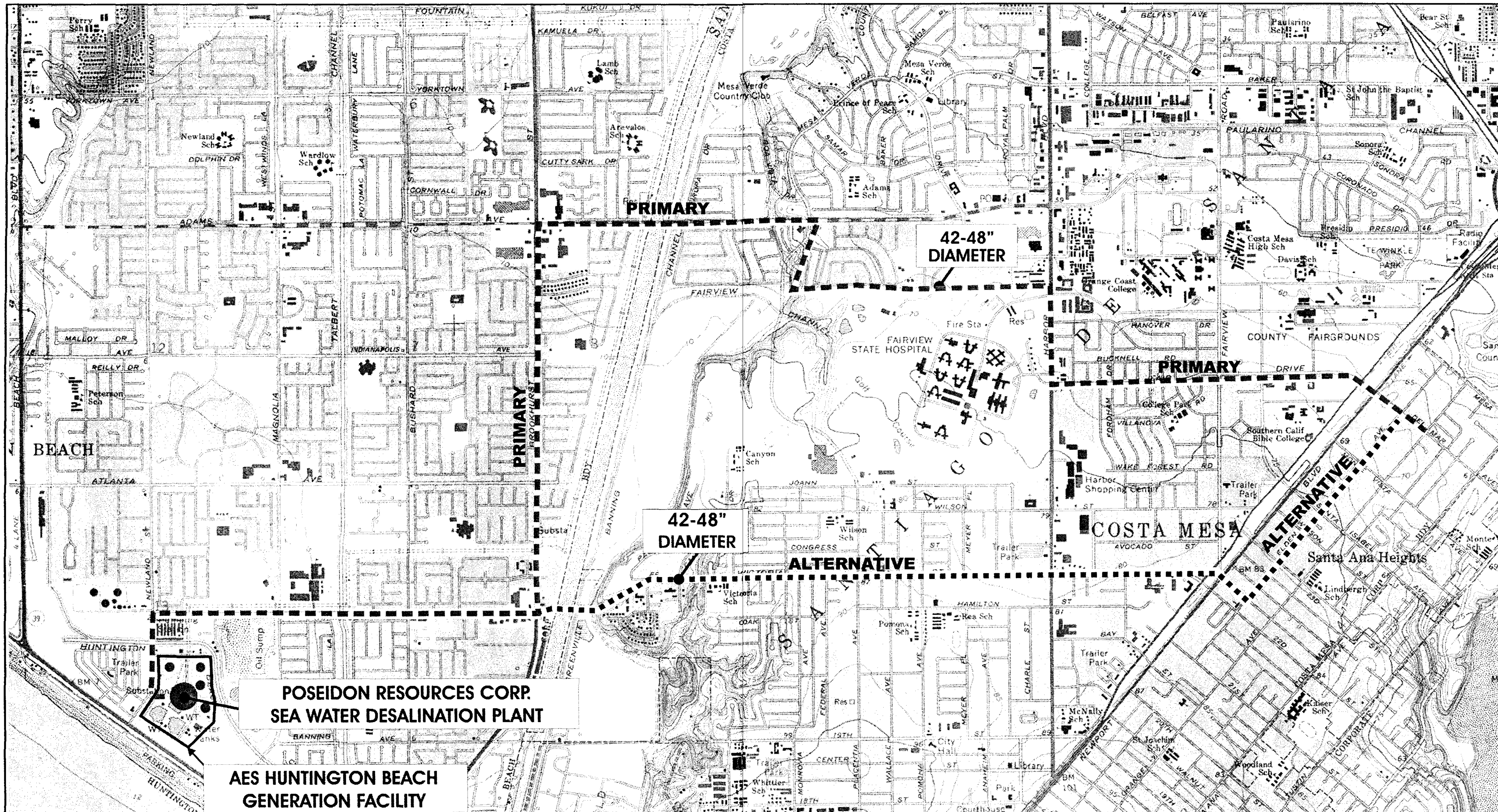

Source: Carollo Engineers, August 2002.

POSEIDON SEAWATER DESALINATION PROJECT

Conceptual Pipeline Alignments

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Exhibit 4

Source: Eagle Aerial Software, June 2001.

* - Booster Pump Station Site

Not to Scale

POSEIDON SEAWATER DESALINATION PROJECT

Booster Pump Station Location Map

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Exhibit 5

Current Project

At the time of the Initial Study, the desalination plant was proposed to be located on a 3.9-acre portion of the existing 22-acre AES Huntington Beach Generating Station. However, upon acquisition of the former SCE storage tank property by AES, the proposed project site was moved to its current location, which was shown as an alternative site in the Initial Study. The City retained RBF Consulting in March 2001 to assist in preparing the EIR for the proposed project. On May 17, 2001 the City completed an Initial Study and distributed the Notice of Preparation (NOP). As project design progressed and an off-site underground pump station within an Orange County Resource Preservation Easement was proposed, an Updated NOP was distributed to local homeowners' associations (HOAs) and property owners surrounding the underground booster pump station site on March 4, 2002. These documents, as well as public comments in response to the NOP, are provided in Appendix A, *INITIAL STUDY/NOTICE OF PREPARATION*. In addition, as part of the proposed project, the applicant has filed a Conditional Use Permit (CUP) and Coastal Development Permit (CDP) with the City of Huntington Beach. These permit applications are available for review at the City of Huntington Beach Planning Department, located at 2000 Main Street, Huntington Beach, California.

3.4 PROJECT CHARACTERISTICS

The proposed project consists of construction of a seawater desalination plant, storage facilities, and pipelines to produce drinking water for delivery into the regional water distribution system to meet the needs of the Southern California Region and particularly Orange County. This section presents an overall description of the proposed project by summarizing four basic project characteristics: the on-site improvements associated with the desalination plant, the above-ground product water storage tank option, the off-site improvements, and the water delivery characteristics. The following project information is based upon the project application submitted to the City of Huntington Beach, in addition to associated project design reports, plans, and related information. All project-related submittals are available for review at the City of Huntington Beach. It should be noted that the project requires a Conditional Use Permit (CUP) and a Coastal Development Permit (CDP) from the City of Huntington Beach.

ON-SITE IMPROVEMENTS

The proposed project involves the implementation of a desalination plant producing approximately 50 million gallons per day (mgd), or 56,000 acre feet per year (afy) of potable water. The project will require the demolition of three fuel storage tanks and the remediation of any soil/groundwater impacted by contamination associated with previous site usage as a fuel storage facility. The proposed desalination project would consist of seawater intake pretreatment facilities, a seawater desalination plant utilizing reverse osmosis (RO) technology, post-treatment facilities, product water storage, chemical storage, on- and off-site booster pumps, and 24 to 48-inch diameter product water transmission pipelines up to 10 miles in length. On-site structures would consist of an administration building, a reverse osmosis facility building, pretreatment filter structure, chemical storage/solids handling building, bulk chemical storage building, product water pump station, flush tank, lime silos, wash water tank, ammonia tank, influent/effluent pump station, and an electrical substation building (refer to Exhibit 3, *CONCEPTUAL SITE PLAN*). Product water would be stored either on-site in an underground product water tank situated within the northern portion of the project site or in an optional aboveground storage tank to the north-northwest.

Proposed Buildings and Structures

The proposed desalination project would consist of the following buildings and structures:

- **Administration Building (approximately 158'L x 57'W x 15'H, 9,900 s.f.):** This building is proposed to be Type-II, non-rated and will be constructed of steel. The exterior will feature flat metal wall panels running vertically along the face of the structure. A metal panel roof system will be screened with a metal fascia using deep-ribbed metal panels running horizontally. All glazing will be tinted and will include clear anodized window frames.

- **Reverse Osmosis Building (approximately 292'L x 132'W x 25'H, 38,544 s.f.):** This building will be a Type-II, non-rated, steel-constructed building housing the reverse osmosis components of the desalination plant and associated indoor pumps. The exterior will feature flat metal wall panels running vertically along the face of the structure. A continuous metal reveal band will be placed mid-height to break up the 25-foot structure vertically. A metal panel roof system will be screened with a metal fascia using deep-ribbed metal panels running horizontally. Full height louvers will match the wall panel color and will be recessed slightly from the face of the structure to allow for shadowing. Panel coloring will match the Administration Building.

- **Pretreatment Filter Structure (approximately 292'L x 144'W x 16'H, 42,000 s.f.):** This open-air structure will house the pretreatment filter components of the plant. It will feature concrete walls matching the color of the Reverse Osmosis Building. The concrete walls will "stair-step" in elevation to a peak that will be finished with the deep-ribbed metal panels running horizontally. These panels will match the fascia of the Administration and Reverse Osmosis Buildings. A painted band will be included to match the reveal band of the Reverse Osmosis Building.

- **Chemical Storage/Solids Handling Building (approximately 90'L x 82'W x 21'H, 7,300 s.f.):** This Type-II, non-rated, steel-constructed building will house the chemical storage and solids handling equipment associated with plant operation. The building will architecturally match the Administration Building, featuring flat metal wall panels running vertically along the face of the structure. The metal panel roof system will be screened with a metal fascia using deep-ribbed metal panels running horizontally.

- **Bulk Chemical Storage Structure (approximately 78'L x 56'W x 21'H, 4,368 s.f.):** This structure will also feature Type-II, non-rated, canopy steel construction and will house various chemicals stored in bulk. The metal panel roof system will be screened with a metal fascia using deep-ribbed panels running horizontally.

- **Electrical Room/Substation Building (approximately 60'L x 30'W x 12'H, 1,800 s.f.):** This Type-II, non-rated, steel-constructed building will match the Administration Building architecturally. The exterior design utilizes flat metal wall panels running vertically along the face of the structure. The metal panel roof system will be screened with a metal fascia using deep-ribbed metal panels running horizontally.

- **Lime Silos (six tanks approximately 20' in diameter and 25' high, 314 s.f.):** The lime silo tanks will be arrange in two rows of three tanks each within the northern portion of the subject site in an area approximately 80 feet long by 57 feet wide. These tanks will be constructed of steel and painted to match the surrounding buildings and structures.

- **Washwater Tank (approximately 45' in diameter by 19' high, 1,590 s.f.):** This single tank will store washwater and will be constructed of steel, painted to match the surrounding buildings and structures. The approximate capacity of this tank would be 200,000 gallons.

- **Flush Tank (approximately 25' in diameter by 29' high, 491 s.f.):** This single tank will store the desalination plant's flush water and would have an approximate capacity of 100,000 gallons. This tank will be constructed of steel and will be painted to match the surrounding buildings and structures.

- **Ammonia Tank (approximately 6' in diameter by 6' high, 28.35 s.f.):** This single tank will store ammonia and will be constructed of high density polyethylene or fiberglass reinforced polyester, and would have an approximate capacity of 1,000 gallons.

- **Underground Product Water Storage Tank (circular option: 250' in diameter and a maximum of 30' deep; rectangular option: 330' L x 175' W x 40' D):** The underground product water storage tank would be either circular or rectangular in shape and would have an approximate capacity of 10 million gallons. The rectangular option would utilize reinforced concrete construction, while the circular option would be pre-stressed and wrapped with galvanized steel. For a detailed discussion of the proposed underground product water storage tank, refer to Section 4.9, *CONSTRUCTION-RELATED IMPACTS.*

Proposed Desalination Plant Flow Process

Intake System: Source water for the desalination plant will be taken from the existing condenser cooling water circulation system from the AES facility. Up to 507 million gallons per day (mgd) of cooling water presently flows to the AES plant through an existing ocean water intake pipeline.

The ocean water is drawn into the intake structure, where it is screened and then pumped through the steam condensers of the AES plant. The heated cooling water is then discharged through an outfall pipeline back into the ocean.

The proposed plant will utilize the heated condenser cooling water as source water for desalination. The desalination plant's intake structure will be located downstream of the steam condensers. Pipelines connecting the existing AES intake/discharge lines to the proposed desalination plant will be located entirely within the existing AES site. Water will flow by gravity into the intake structure and through a pipeline connecting AES facilities to the proposed desalination plant. An intake pump station will be located near the pre-treatment filters of the proposed plant to lift the water out of the intake pipeline and into the RO pre-treatment facilities (refer to Exhibit 6, *DESALINATION PROCESS FLOW SCHEMATIC*). The proposed plant would divert approximately 100 mgd of water from the AES condenser cooling water system. To prevent growth of marine organisms in the intake system, chlorination of supply water will be provided on an as-needed basis. Aside from a connection point within the AES site, no modification of AES ocean intake facilities will be required.

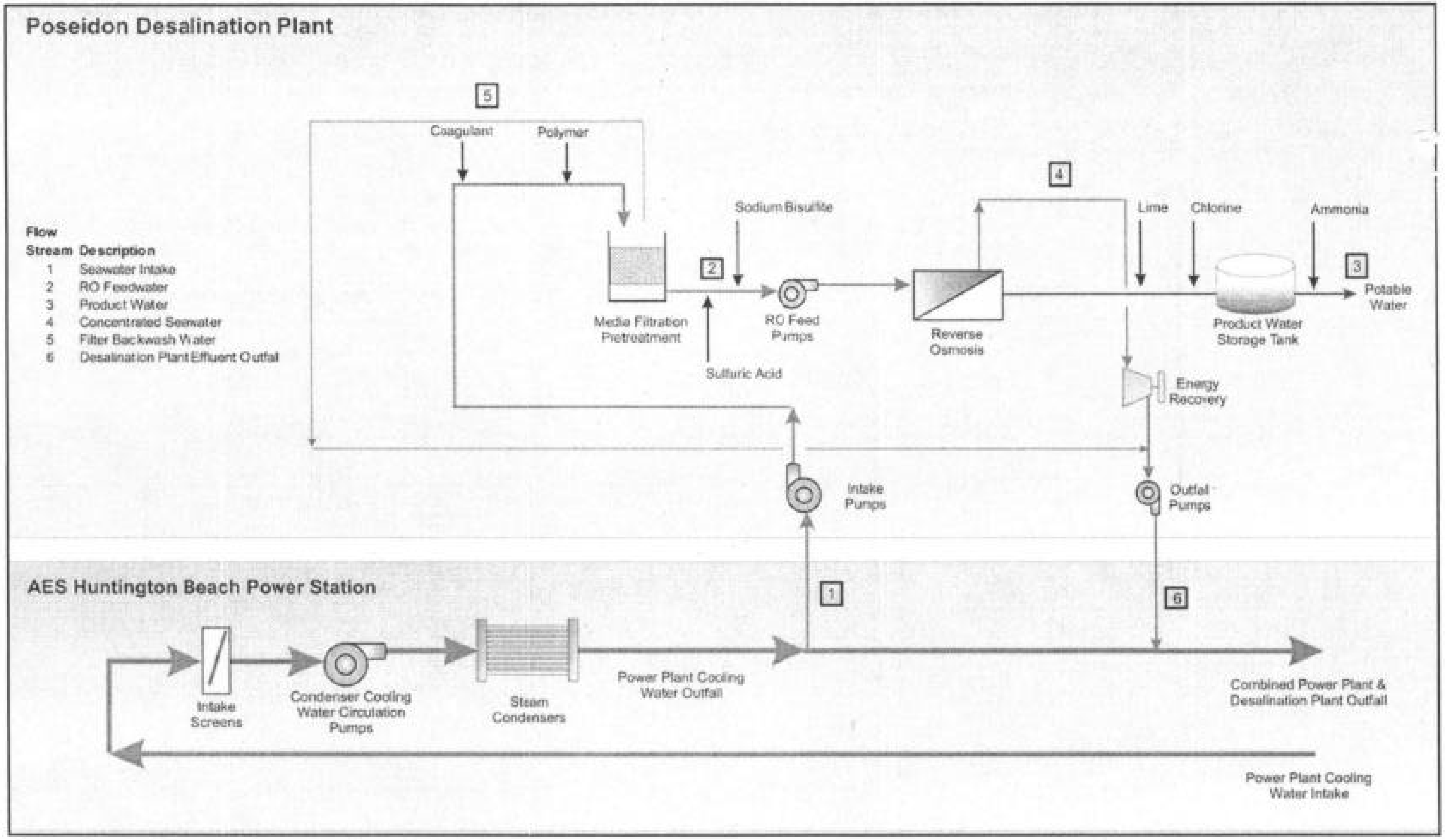
Pretreatment System: The proposed desalination plant will utilize either a single-stage or two-stage gravity media filtration pretreatment system. The addition of coagulants, such as ferric chloride and polymers, will be provided as appropriate to enhance the operation of the media filters and to prepare the water for RO treatment. There are a variety of pretreatment filtration systems and technologies available that can meet the requirements for RO treatment. The actual process to be used (single-stage or two-stage) will be determined during the final design phases of the project.

The final phase of pretreatment will be cartridge filtration. The filter cartridges will be standard 5-micron polypropylene wound filters enclosed in a pressure vessel. The pressure vessels will be located in the RO feed water piping between the pretreatment and RO processes.

The RO intake water will be chlorinated intermittently to prevent microbiological growth on the filter media. Any chlorine remaining in the filter effluent water can damage the RO membranes. The filter effluent will be de-chlorinated using sodium bi-sulfite. In addition, the RO feed water will be treated with sulfuric acid to reduce the potential for scale formation in the RO process. The amount of sulfuric acid added to the water will be determined by the bicarbonate concentration of the seawater and the Stiff Davis Index (SDI) needed in the RO concentrate. The acid also provides carbon dioxide in the RO permeate (product water), which is needed to react with the lime for product water stabilization in the post-treatment step.

Reverse Osmosis Process: The RO process will be a single-pass design using high-rejection seawater membranes. The system will be made up of 13 process trains, each train with a design capacity of about four mgd. This arrangement provides approximately eight percent standby capacity, which is needed to ensure continuous water delivery with normal membrane wear and maintenance requirements.

High-pressure, electrically-driven feed pumps will convey water from the intake filters through the RO membranes. The pumps will provide feed pressures ranging from 800 to 1,200 pounds per square inch (psi), and will be used within the reverse osmosis building. The actual feed water pressure depends on several factors including temperature of the intake water, salinity of the intake water, and the age of the membranes. The pumps will be equipped with variable frequency drives to improve energy efficiency and to provide pressure control over a wide range of feed water quality and membrane conditions. To further improve energy efficiency, the high-pressure feed pumps



Source: Poseidon Resources Corporation, August 2002.

POSEIDON SEAWATER DESALINATION PROJECT

Desalination Process Flow Schematic

RBF CONSULTING PLANNING ■ DESIGN ■ CONSTRUCTION

08/02 JN 10-101409

Exhibit 6

will be equipped with energy recovery devices. A large amount of residual pressure is remaining in the concentrated seawater leaving the RO process. The energy recovery devices recover this energy reducing the net energy demand for the system by approximately 30 percent. Additional energy savings may result from the use of warmer water provided to the RO process by the power plant's cooling process. The warmer water increases the efficiency of the RO membranes.

Post-Treatment Process: Product water from the RO process requires chemical conditioning prior to delivery to the distribution system to increase hardness and reduce its corrosion potential. Lime will be used for post-treatment stabilization of the water. In addition, the final product water must be disinfected prior to delivery to the distribution system. Chlorine, in the form of sodium hypochlorite, will be added as a disinfectant to meet the State Department of Health Services (DHS) water quality standards for potable water disinfection and to control biological growth in the transmission pipeline.

Outfall Process: The byproduct of the RO process will be concentrated seawater. Approximately one gallon of concentrated seawater will be created for every gallon of potable drinking water produced. Therefore, for the proposed 50 mgd desalination plant, approximately 50 mgd of concentrated seawater (brine) will be generated. The salinity of the concentrate will be about 68,000 parts per million (ppm), twice the concentration of the incoming seawater. The concentrated seawater will re-enter and blend with up to 407 mgd of the AES Plant's condenser cooling water circulation system for discharge back into the ocean. The blending point will be downstream of the intake point for the desalination plant to prevent re-circulation of the concentrated seawater back into the desalination plant intake (refer to Exhibit 6, *DESALINATION PROCESS FLOW SCHEMATIC*). In addition, the filters will be cleaned (backwashed) to remove the seawater solids that accumulate in the media beds. The amount of backwash water necessary will be about four percent of the total intake water flow. For a 50 mgd facility, with an intake of 100 mgd of raw seawater, approximately 4 million gallons of filter backwash water will be produced per day. The filter backwash water will be combined with the concentrated seawater for return back into the ocean. The constituent concentrations of the combined desalination plant concentrated seawater discharge and the AES plant's cooling water discharge meet the requirements of the California Ocean Plan as administered by the State Regional Water Quality Control Board (also refer to Section 4.3, *HYDROLOGY AND WATER QUALITY*). Aside from a connection point within the adjacent AES site, no modification of AES ocean outfall facilities will be required.

Reverse Osmosis Membrane Maintenance

The accumulation of silts or scale on the RO membranes causes fouling which reduces membrane performance. The membranes will be periodically cleaned to remove these foulants and extend membrane life. Normally cleaning frequency is twice per year. To clean the membranes, a chemical cleaning solution is circulated through the membranes. The reverse osmosis system trains will be cleaned using a combination of cleaning chemicals such as industrial soaps (e.g. sodium dodecylbenzene, which is frequently used in commercially available soaps and toothpaste) and weak solutions of acids and sodium hydroxide.

The cleaning process includes two steps: first, circulating a number of cleaning chemicals in a predetermined sequence through the membranes; and second, flushing the cleaned membranes with clean water (permeate) to remove the waste cleaning solutions and prepare the membranes for normal operation. It should be noted that the actual cleaning chemicals used will be based on the observed operation and performance of the system once it is placed in operation. For a detailed discussion of chemicals and materials to be utilized for reverse osmosis membrane maintenance, including a description of volumes/ratios, refer to Section 4.8, *HAZARDS AND HAZARDOUS MATERIALS*.

Subsequent to the circulation of the cleaning chemicals through the RO membranes, membrane flushing will be performed using membrane permeate fresh water which would be free of chlorine. Potable water coming from off-site City facilities will not be utilized for operation of the flush tank or washwater tank. The membrane flushing process would include a first flush (removing most of the waste chemicals), and subsequent flushes (containing only trace amounts of cleaning chemicals). It should be noted that besides permeate and residual cleaning solution, the waste flush water would also contain a small amount of concentrated waste cleaning solution. This concentrate would be retained in the RO train concentrate lines at the time operation is stopped for flushing. As the entire RO train is flushed, this concentrate would be flushed out of these lines. All chemicals used in the membrane cleaning process and the first membrane flush will be directed to a designated 300,000-gallon storage tank ("washwater tank") for mixing and treatment. The washwater tank will be equipped with a mixing system and chemical feed system. The content of the tank will be continuously mixed and the pH of the waste cleaning mix will be monitored. The waste cleaning solution will be treated using sulfuric acid or sodium hydroxide as needed to neutralize the solution.

The "first flush" treated waste cleaning solution from the washwater tank will be discharged into the local sanitary sewer for further treatment at the Orange County Sanitation District (OCSD) regional wastewater treatment facility. OCSD has indicated that its facilities are of adequate capacity to accommodate this waste cleaning solution.[1] The flush water following the "first flush" water would be diluted with brine by-product discharge, treated filter backwash, and AES cooling water discharge, and then sent to the Pacific Ocean via the AES outfall. An alternative to discharging the RO membrane cleaning solution into the OCSD system is to discharge the solution into the Pacific Ocean via the AES outfall. The majority of the chemicals within the membrane cleaning solution would be either below detection levels or regulatory limits, even before dilution with other desalination plant and AES discharges. Dilution would further minimize impacts to the marine environment and would assure National Pollution Discharge Elimination System (NPDES) compliance. It should be noted that potable water coming from off-site City facilities will not be utilized for operation of the flush tank or wash water tank.

For a discussion of impacts in regards to RO membrane cleaning solution, refer to Section 4.3, *HYDROLOGY AND WATER QUALITY*, Section 4.6, *PUBLIC SERVICES AND UTILITIES*, and Section 4.8, *HAZARDS AND HAZARDOUS MATERIALS*.

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1 E-mail from Nikolay Voutchkov, OCSD, to Josie McKinley, Poseidon Resources Corporation, May 29, 2002.

Chemical Storage

Various chemicals typically associated with desalination plant operation will be stored on-site. These chemicals include sodium hypochlorite, ammonia, lime, ferric sulfate, polymer, sulfuric acid, sodium bi-sulfite, and the RO membrane-cleaning solution described above. All such chemicals will be stored, handled, and used in accordance with all applicable Federal, State, and local standards. This topic is further addressed in Section 4.8, *HAZARDS AND HAZARDOUS MATERIALS*.

Energy Consumption

A 50-mgd desalination plant will require approximately 30 to 35 mega-watt hours of power to operate. Based on 24 hour per day operation, the daily energy consumption of the proposed desalination plant is estimated to be between 720 and 840 mega-watt hours per day. This amount of electricity could provide power for the average demand of between 30,000 and 35,000 residential units. The facility would utilize off-peak power to the maximum extent practicable. In order to maximize the desalination plant's power efficiency, potable water production may be halted for short periods of time, at which point the facility would distribute water from its product water storage tank. The desalination facility will not include a backup generator. Emergency backup power will come from the AES Huntington Beach Generating Station's auxiliary reserve bank.

Parking

Automobile parking for facility employees and visitors will be provided in an area surrounding the administration building, located within the northern portion of the subject site. Approximately 30 parking stalls will be provided, which will include several stalls designated for disabled persons in accordance with Americans with Disabilities Act (ADA) requirements. The parking lot will feature appropriate landscaping along its perimeter, per City standards.

Site Access

Access to the proposed desalination site for employees, delivery trucks, and construction vehicles would be provided via the existing AES access point (main gate) along the eastern side of Newland Street. From this point vehicles would travel in a southeasterly direction, along the northern side of the AES generating units. At a point just east of AES generating unit number one and north of the service water tank, the access route will turn to the northeast and would proceed to the southwestern corner fo the project site. Vehicles would then utilize internal access roads to their destination within the proposed project site.

Staffing

The proposed desalination plant will employ an approximate total of 18 people and will operate 24 hours a day, 365 days a year. Staff positions will include management, operators, maintenance, and administration/staff support. In addition, outside contracting of part-time staff is anticipated for specialized services such as electrical and mechanical maintenance. The estimated number of staff on duty during regular working hours Monday through Friday will be five to seven, with a minimum of two people on duty during swing shifts, graveyard shifts, and weekends.

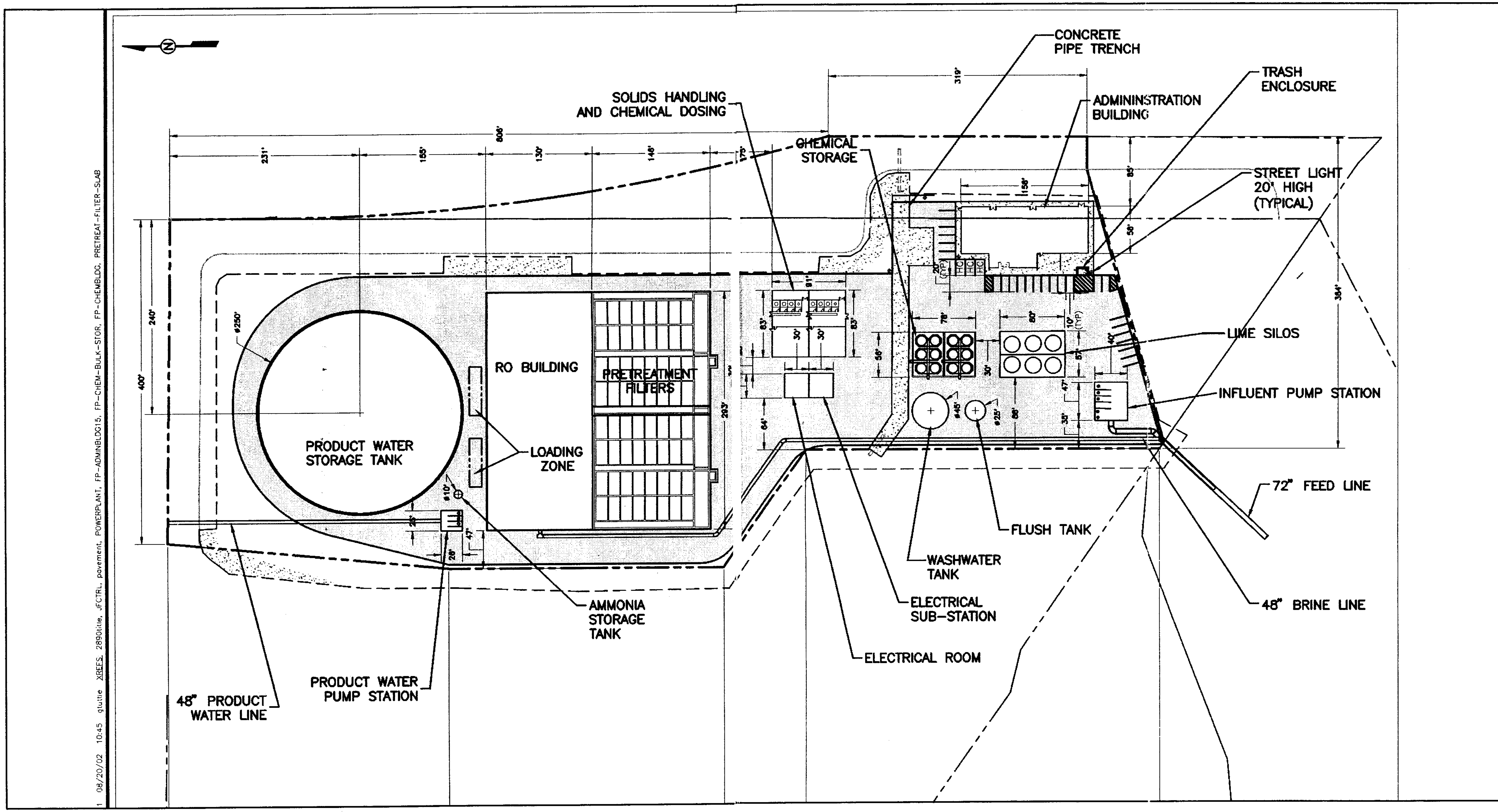
ABOVEGROUND PRODUCT WATER STORAGE TANK OPTION

The proposed project also includes an option that would eliminate the on-site underground product water storage tank and instead implement an aboveground tank on one of two separate parcels owned by AES to the north/northwest of the proposed desalination facility (refer to Exhibit 7, *ABOVEGROUND PRODUCT WATER STORAGE TANK - "NORTH" OPTION* and Exhibit 8, *ABOVEGROUND PRODUCT WATER STORAGE TANK - "WEST" OPTION*). The two optional aboveground tank sites are situated adjacent to one another and are currently developed in a similar fashion to the proposed desalination facility site, with fuel oil storage tanks, containment berms, and associated pipelines on-site. The two optional tank sites are each approximately two acres in size and are currently developed with what have historically been referred to as the "West" and "North" fuel oil storage tanks (for the purposes of this document, the optional tanks shall hereafter be referred to as the "West" tank site and "North" tank site). These two fuel oil storage tanks, in a similar fashion to the "South" and "East" tanks on the proposed desalination facility site, were formerly used in conjunction with the Huntington Beach Generating Station until the late 1980's. It should be noted that the City of Huntington Beach has also proposed to site a water storage tank on the "North" tank site. Should the aboveground product water storage tank option be selected, the proposed project would utilize the "West" tank site, or, if the City opts not to construct its water storage tank, the "North" tank site.

The "West" tank site is bounded by the AES Huntington Beach Generating Station to the south, Newland Street to the west, Edison Avenue and various industrial uses to the north, and the "North" tank site to the east. The "North" tank site is bounded by the proposed desalination facility site to the south, the "West" tank site to the west, Edison Avenue and the City's Beach Maintenance Facility to the north, and the Huntington Beach Channel to the east. The City of Huntington Beach General Plan and Zoning designations for the optional sites are the same as the proposed desalination facility ("Public" [P], and "General Industrial with Oil, Coastal Zone, and Flood Plain Overlays " [IG-O-CZ-FP2]).

The optional aboveground product water storage tank would have an approximate capacity of 10 million gallons and would be 250 feet in diameter and a maximum of 30 feet in height. Tank implementation would require the demolition of either the "West" or "North" fuel oil storage tank, depending on which site is utilized. The existing southern and western berms surrounding the "North" tank and southern and eastern berms surrounding the "West" tank would also be demolished, depending on which site is utilized. The exterior berms on both tank sites will remain as is. Potable product water would be pumped from the proposed desalination facility to the product water tank for storage via underground piping. Either tank site would include an on-site storm drainage system (no such drainage system is currently installed) which would transfer storm water to the desalination facility's storm water system, ultimately discharging into the Pacific Ocean via the AES outfall.

Product water would be distributed from the tank during periods when desalination facility output is reduced (for electricity conservation) or temporarily halted (for maintenance, cleaning, repairs, etc.). The aboveground tank would be designed and painted to match the general aesthetic character of the proposed desalination facility. In addition, landscaping and other enhancements



Source: Poseidon Resources Corporation, August 2002.

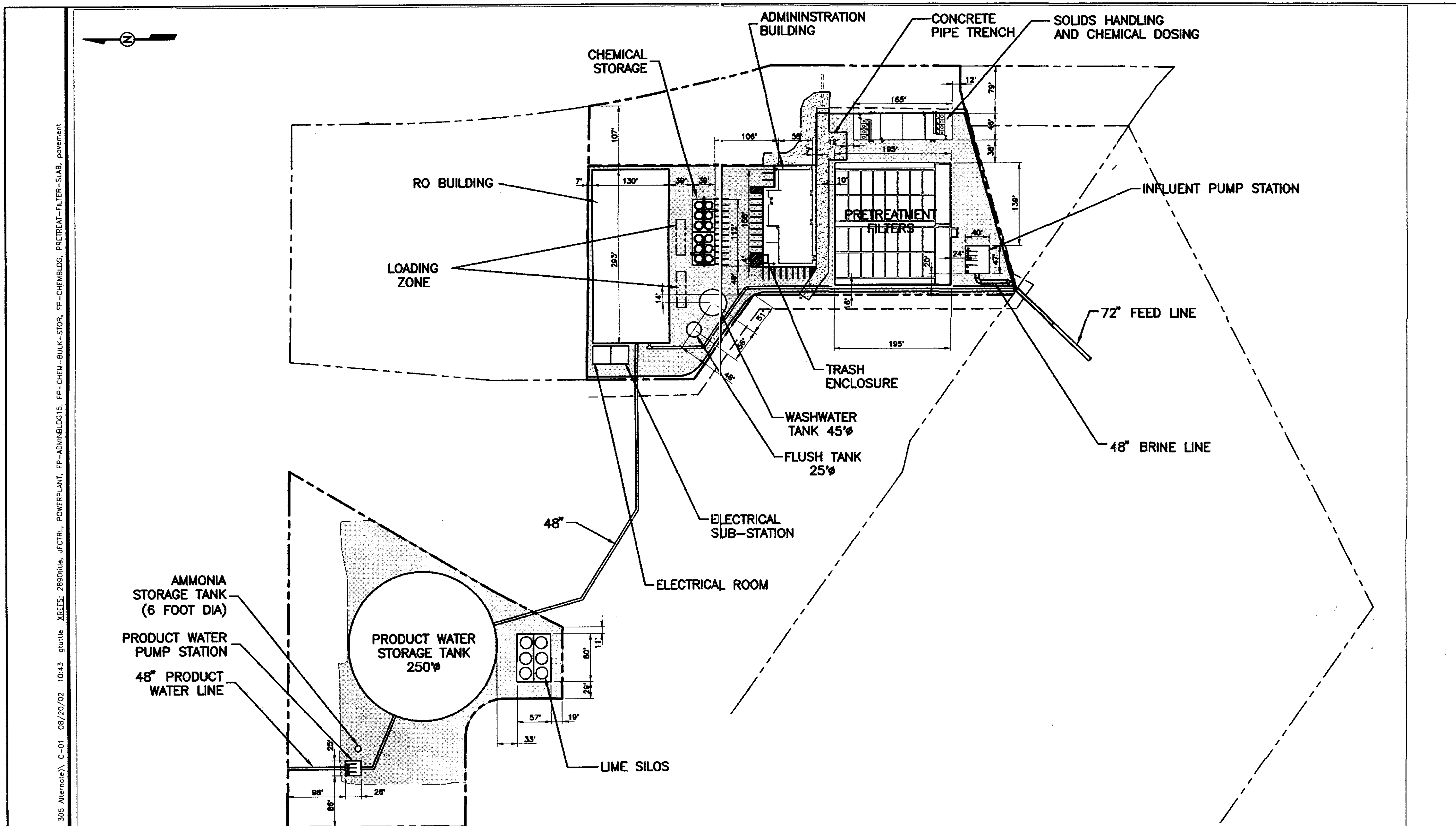
Not to Scale

POSEIDON SEAWATER DESALINATION PROJECT

Aboveground Product Water Storage Tank - "North" Option

RBF CONSULTING PLANNING ■ DESIGN ■ CONSTRUCTION 08/02 JN 10-101409

Exhibit 7



Source: Poseidon Resources Corporation, August 2002.

Not to Scale

POSEIDON SEAWATER DESALINATION PROJECT

Aboveground Product Water Storage Tank - "West" Option

would be utilized to screen the tank from local sensitive receptors and adjacent roadways to the maximum extent practicable. It should be noted that implementation of the aboveground storage tank option on either the "North" or "West" sites would alter the site design of the proposed desalination facility. Under either option, the desalination facility would change so that the southern-most point of the site boundary would shift north by approximately 125 feet. In addition, depending on which optional aboveground tank site is utilized, several improvements would either be moved from the proposed desalination facility site to the optional tank site or repositioned within proposed desalination facility boundaries (refer to Exhibit 7, *ABOVEGROUND PRODUCT WATER STORAGE TANK - "NORTH" OPTION*, and Exhibit 8, *ABOVEGROUND PRODUCT WATER STORAGE TANK - "WEST" OPTION*).

OFF-SITE IMPROVEMENTS

Water Transmission Pipeline

In order to convey the project's potable drinking water off-site, the project requires construction of water transmission lines to connect to existing regional transmission and local water distribution systems. Although precise pipeline alignments may be modified during final engineering analyses, the conceptual pipeline alignments are shown in Exhibit 4, *CONCEPTUAL PIPELINE ALIGNMENTS.* A total of two pipeline alignments are currently being considered to convey water eastward from the desalination plant to its destination within the City of Costa Mesa, east of SR-55 at the intersection of Del Mar Avenue and Elden Avenue. The majority of each pipeline alignment is planned for existing public streets, easements, or other rights-of-way, and the alignments are not anticipated to require disturbance of native vegetation or otherwise impact sensitive resources. The proposed alignments consist of a 42- to 48-inch force main, ranging in length from approximately 30,000 to 40,000 linear feet along the two different conceptual alignments. The proposed routes will utilize trenchless installation of pipeline in order to traverse waterways and/or roadways with a high sensitivity to traffic disturbance. This topic is further addressed in Section 4.9, *CONSTRUCTION RELATED IMPACTS.*

Underground Booster Pump Station

The off-site construction of an underground booster pump station will be required as part of the seawater desalination plant project in order to convey potable water from the subject site to the regional distribution system. The underground pump station is proposed to be located underground within an unincorporated area of the County of Orange, along the eastern border of the City of Newport Beach, approximately 1.5 miles south of the University of California, Irvine. The site is within an Orange County Resource Preservation Easement, approximately 1/4 mile north of the San Joaquin Reservoir, where the East Orange County Feeder Number Two and the OC-44 transmission pipelines converge (refer to Exhibit 5, *BOOSTER PUMP STATION LOCATION MAP*).

The off-site underground booster pump station will include pumps, telemetry equipment, appurtenances, and two diesel powered electrical generators for emergency back-up purposes. These generators would be Caterpillar Model 3516 units or similar equipment and would supply approximately seven megawatts of emergency power for adequate operation of the pump station (in regards to flow and pressure). These diesel powered generators would require a 7,500-gallon diesel fuel storage tank (assuming a 24-hour emergency period), with a diameter of eight feet and a depth of 26 feet. The booster pump station, including both the generators and diesel fuel storage tank, would be placed entirely underground to maintain the natural character of the surrounding resource preservation easement. Any displaced vegetation would be replaced.

Water Delivery

As described below in Section 3.5, *PROJECT NEED AND OBJECTIVES*, the project will provide a supplemental and alternative source of potable water to Orange County and the region. Water produced at the desalination plant will be delivered via the off-site project pipeline into a large water transmission pipeline operated by Mesa Consolidated Water District (the OC-44 pipeline). From there the product water would travel into the existing regional water distribution system that is operated and maintained by the Metropolitan Water District (MWD) of Southern California. The OC-44 pipeline and the MWD's regional water distribution system currently distribute water that has been diverted from Northern California sources and the Colorado River. This water is transported over many miles, blended together, treated, and then delivered throughout Orange County and the region for domestic use. This system has long provided imported water to supplement the supply of native water and groundwater that is available to Orange County and the region. The proposed project will provide another source of supplemental water supply for Orange County and the region, and will thereby increase the delivery reliability of the system (refer to Section 4.6, *PUBLIC SERVICES AND UTILITIES*, for an analysis of the potential water compatibility impacts that may result from introduction of desalinated seawater into the regional water system).

3.5 PROJECT NEED AND OBJECTIVES

NEED FOR PROJECT

It is common knowledge that Southern California could not exist without its extensive imported water system. There are three main parts to the region's imported water system: the Los Angeles Aqueduct (operated by the Los Angeles Department of Water and Power); the State Water Project (operated by the Department of Water Resources); and the Colorado River Aqueduct (operated by the Metropolitan Water District). The MWD and others operate numerous transmission pipelines necessary to distribute imported water supplies throughout the region.

Although the region has made a significant financial investment in the imported water system and the system has met all of the region's supplemental water supply needs (except in times of extreme drought), there is present concern regarding the amount of water that will continue to be available for delivery through the imported water system. Increasing regulatory activity and environmental water use needs in Northern California and in the Mono Lake area have reduced the amount of imported water supply (compared to system capacity and earlier projections) that is available to Southern California. Likewise, there is a fundamental change occurring in the availability and use of Colorado River water because California, for the first time, will be required to reduce the amount of Colorado River water it uses. California is currently finalizing its Colorado River Water Use Plan. Implementation of the Plan will, among other things, result in a reduction of up to 1 million acre feet per year as compared to the highest amount diverted in the past 25 years (from a high of 5.4 million acre feet per year to the California allotment of 4.4 million acre feet per year).

Solutions to potential water shortage and reliability problems include an increased reliance on many different sources of water supply and a continued emphasis on water conservation through implementation of State-approved Best Management Practices (BMP's). Orange County has implemented several successful programs including ultra low flow toilet and low flow shower head programs, conservation based rate structure programs, landscape conservation programs and commercial, industrial and institutional conservation programs. However, according to the Orange County Water District Master Plan Report (Section 5.6.2), potential conservation savings will be limited to no more than 30,000 to 60,000 acre feet per year. This amount is hardly sufficient to offset potential losses in imported supplies.

Water recycling (reclamation of wastewater to produce water that is safe and acceptable for various non-potable uses, but not approved for drinking and other domestic uses) is a technology that has provided a valuable source of water supply for Southern California. Southern California (and Orange County in particular) leads the way in producing recycled water to offset potable water demands. In 1996 the major imported water supplier in the region, MWD, adopted its so-called "Southern California's Integrated Water Resources Plan" (IRP) representing a dramatic shift in water management and resource planning for the region. The IRP identified 80 different local recycling projects producing over 150,000 acre feet per year of water supply available to the region. Depending upon technological advancements and economic constraints, the IRP projected that as much as 800,000 acre feet of recycled water could be made available to the region. Recycled water projects will certainly be relied upon to replace the future reductions in imported water supplies and to meet the projected growth in the region. However, recycled water has not been approved for drinking or for other potable uses.

Desalinated seawater can be made directly available for drinking and other potable uses. Consequently, seawater desalination was also one of several integrated sources of supply identified in the IRP. The IRP also recommended that groundwater recovery projects, storage projects, water recycling projects, water transfer projects and water conservation projects be included in the "resource mix". The IRP predicts that "about 200,000 acre-feet per year (of desalinated ocean water) could be developed by 2010" (p. 3-12.) The proposed Poseidon Seawater Desalination Project represents an opportunity to develop approximately 56,000 acre-feet per year, or approximately one fourth of that project supply need.

Further, as a new reliable and sustainable water source, water produced through the desalination process may become increasingly important in meeting increasing water demands generated by anticipated statewide population growth and related development activities. In this regard, the California Department of Water Resources (DWR) provides an assessment of anticipated statewide population growth and related water consumption statistics in their "Bulletin 160 series". The DWR employs these projections in developing and implementing long-range strategies addressing California's water demands. Information from Bulletin 160-98 (the most recent of the Bulletin 160 series) is presented in Table 3-1, *CALIFORNIA - 1995 TO 2020 WATER DEMANDS AND RELATED STATISTICS*.

Table 3-1
CALIFORNIA - 1995 TO 2020 WATER DEMANDS AND RELATED STATISTICS

	1995	2020 Forecast	Change (percentage)
Population (million)	32.1	47.5	+15.4
Irrigated crops (million acres)	9.5	9.2	-0.3
Urban water use (million acre feet)	8.8	12.0	+3.2
Agricultural water use (million acre feet)	33.8	31.5	-2.3
Environmental water use (million acre feet)	36.9	37.0	+0.1

Source: California Department of Water Resources, Bulletin 160-98: California Water Plan

Based on the State's assessment of future water availability, and the water demand information presented in Table 3-1, DWR projects 2020 statewide water shortages at approximately 2.4 million acre feet in an average water year, and 6.2 million acre feet in drought years. Effects of water shortages are typically evidenced in required rationing, curtailment of development, and environmental impacts to biologic resources. In general, anticipated statewide shortages can be expected to translate to equivalent local and regional shortages, with similar economic and environmental effects.

In a more localized context, Bulletin 160-98 presents an assessment of existing and projected water supplies and demands for the South Coast Hydrologic Area. Extending eastward from the Pacific ocean, the South Coast Hydrologic Area (South Coast Region, or Region) is generally defined as that area bounded by the Santa Barbara-Ventura County line and the San Gabriel and San Bernardino mountains on the north, and a combination of the San Jacinto Mountains and low-elevation mountain ranges in central San Diego County on the east, and the Mexican border on the south.

The South Coast is California's most urbanized region. Although it covers only about 7 percent of the State's total land area, it is home to approximately 54 percent of the State's population. The largest cities in the region are Los Angeles, San Diego, Long Beach, Santa Ana, and Anaheim. Although highly urbanized, about one-third of the Region's land is publicly owned. About 2.3 million acres is public land, of which 75 percent is national forest.

Previously discussed anticipated statewide water shortages will likely be reflected locally within the South Coast Region, and as indicated in Table 3-2, will become acute under drought conditions where demands may exceed available water sources by up to 21 percent.

Table 3-2
SOUTH COAST REGION WATER BUDGET (THOUSAND ACRE FEET) [2]

	1995		2020	
	Average	Drought	Average	Drought
Water Use				
Urban	4,340	4,382	5,519	5,612
Agricultural	784	820	462	484
Environmental	100	82	104	86
Total	**5,224**	**5,283**	**6,084**	**6,181**
Supplies				
Surface Water	3,839	3,196	3,625	3,130
Groundwater	1,177	1,371	1,243	1,462
Recycled and Desalted	207	207	273	273
Total	**5,224**	**4,775**	**5,141**	**4,865**
Shortage	**0**	**508**	**944**	**1,317**

Source: California Department of Water Resources, Bulletin 160-98: California Water Plan.

PROJECT OBJECTIVES

The overall objective of the project is to provide Orange County and the surrounding region with a long-term, reliable, high quality local source of potable water. Project implementation will create a local drought-proof supply of domestic water and would reduce Orange County's dependence on imported water, consistent with the goal of integrated water resource management. A key advantage of the selected site is to utilize existing ocean intake/discharge lines of sufficient seawater volume to avoid the impact of constructing new ocean intake/discharge facilities.

The project is intended to realize the following objectives:

- Provide a reliable local source of potable water to Orange County and the surrounding region that is sustainable independent of climatic conditions and the availability of imported water supplies or local groundwater supplies;
- Provide product water that meets or exceeds the 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;

[2] Water use/supply totals and shortages may not sum due to rounding.

- 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.

3.6 PROJECT PHASING

The demolition, remediation, and construction process of the proposed project would last approximately 24 months, including time necessary to acquire all required agreements, permits, and approvals. Project phasing would be divided into three separate categories, composed of the following:

- **On-Site Desalination Facility Construction:** This portion of the proposed project would last approximately 24 months, and would include such activities as on-site demolition, grading/excavation, construction of desalination facilities, landscaping, and facility startup/testing. Import and export of earthen materials would occur primarily during the first six months and last four months of this phase of the project.

- **Off-Site Product Water Transmission Pipeline Construction:** This portion of the project would last approximately 21 months, and would start about three months after the beginning of on-site desalination facility construction. This phase would include such activities as pipeline installation, implementation of pipeline under waterways/major roadways, soil remediation, removal of pipeline, and facility startup/testing. Import and export of earthen materials would occur primarily during the middle 12 months of this phase.

- **Off-Site Product Water Underground Booster Pump Station Construction:** This phase of the proposed project would last approximately 18 months, and would begin approximately six months subsequent to the commencement of on-site desalination facility construction. This portion of the project would include such activities as grading/excavation/paving, pump station construction, emergency power generator construction, landscaping, and facility startup/testing. Import and export of materials would occur mainly within the first six months and final six months of the phase.

It should be noted that it is anticipated that all three phases would be implemented concurrently for the final 18 months of the proposed project.

3.7 AGREEMENTS, PERMITS, AND APPROVALS REQUIRED

The following agreements, permits, and approvals are anticipated to be necessary:

Approval/Permit, Permits to Operate	Agency
Final EIR Certification	City of Huntington Beach
Conditional Use Permit	City of Huntington Beach
Coastal Development Permit [3]	City of Huntington Beach
Franchise Agreement	City of Huntington Beach
Drinking Water Permit	State of California Department of Health Services
Coastal Development Permit [4]	California Coastal Commission (CCC)
NPDES Permit	Santa Ana Regional Water Quality Control Board
Permit to Operate	South Coast Air Quality Management District
Encroachment Permits	U.S. Army Corps of Engineers (Santa Ana River Crossing)
	Caltrans, District 12 (SR-55 undercrossing)
	County of Orange (channel crossings, pump station)
	City of Huntington Beach (product water pipeline)
	City of Costa Mesa (product water pipeline)
	Mesa Consolidated Water District (product water pipeline)
Institutional Agreements	Various cities, agencies, and regional water purveyors.

3 The City's Coastal Development Permit approval may be appealed to the California Coastal Commission.

4 A CDP is required directly from the CCC for the ocean discharge.