

Chapter 1.0 Project Description

1.0 Summary

The Big Wave Project is located on the north side of Half Moon Bay, on the San Mateo County Coast (as shown in *Figure 1.0*). The small Half Moon Bay airport is immediately adjacent to the east; Princeton Harbor is adjacent to the south; Pillar Point Headlands to the west; and El Granada Mobile Home Park to the north. The Fitzgerald Marine Reserve, which is bracketed by Maverick's Surf break to the south and Montara Beach to the north, is just ¼ mile to the west.

The Big Wave Project is an economically and environmentally sustainable community that will provide housing and employment opportunities for 50 ultra-low income developmentally disabled (DD) adults through a Wellness Center. In addition to the Wellness Center, the Big Wave Project will integrate a high technology office complex, an urban farm, and restored wetlands into its social and environmental contexts. It is a model project demonstrating how to integrate environmental protection into urban design. Big Wave will be operated as a Cooperative with the residents owning shares of the residential development and Big Wave businesses. All facilities will be Platinum LEED Certified Construction. The project will include state-of-the-art water quality measures and ground water recharge. All water will be recycled. All power will be renewable. All farming will be organic and sustainable. Over 50% of the site will be restored into high functioning coastal wetlands.

The Big Wave Project includes two properties located on Airport Street in Princeton, adjacent to the southwest corner of the Half Moon Bay Airport. Big Wave, LLC currently owns these two properties, the 5.275 acre site for residences and Wellness Center and the 14.253 acre site for an Office Park. Big Wave, LLC is in the process of donating the residences and Wellness Center to the Big Wave Group, Inc. Big Wave Group, Inc., is a non-profit 501(c)3 organization with the goal to provide affordable housing, food services, employment, recreation and educational services for developmentally disabled adults.

Summary of Project Features:

- Economic and environmental sustainability, Platinum LEED Certified Construction;
- 50 Residential units for ultra-low income DD adults, 20 low income units for staff;
- Generates over 80 DD jobs immediately and provides potentially over 700 future jobs (employing 450 Coastside residents);
- 225,000 square feet, four three story, "green" buildings providing high-tech office space for local Coastside employment with 640 parking spaces;
- Ground Water Infiltration System that will recharge the Pillar Point Marsh aquifer
- Reduced traffic on Highway 1 and environmental design reduces air pollutants by 900 tons/year;
- 600 kilowatts of solar power, 50 kilowatts of wind power, 5 kilowatts fuel cell, 5 million BTU/hr solar heating, geothermal cooling;
- Regional Water Quality Control Board permitted onsite water recycling for toilets and irrigation providing a safeguard from ground water overdraft as well as protection of wild and scenic rivers and environmentally sensitive streams;
- State and County Health Department approved onsite water supply and treatment with the backup option of Municipal Water and Wastewater Treatment;
- 50 sustainable acre organic vegetable farming, free-range chickens and eggs, Farmers Market;
- 25 acres of industrial zoned land converted to vegetable farming with a long term lease;
- Sustainable livestock farming, dairy including yogurt, milk and ice cream;
- 9-acre wetlands restoration, wetlands plant nursery;
- Recreation including movies, basketball court, pool and fitness center for Office Park and Wellness Center;

- Commercial laundry (Wellness Center and Office Park service) and commercial kitchen in Wellness Center for community meals and catering;
- Microwave communications providing redundant link to AT&T Fiber-link; and
- Extension of the Coastal Trail and trail to the Pillar Point bluffs.

1.1 Wellness Center Facilities Description

The Wellness Center will provide resident-owned, affordable housing that meets Platinum LEED standards. The project goals include 100% water, energy and food production sustainability. The Wellness Center will be 100% financially sustainable through revenue-generating businesses and through private and public donations. Over half of the property will be restored to native California wetlands. This project demonstrates a unique integration of native habitat and accessibility for the developmentally disabled.

1.1.1 Integration and Restoration of the Wetlands Habitat

The site plan for the Wellness Center is illustrated in *Figure 1.1.1*. The Wellness Center site is approximately 5.25 acres. The wetlands restoration and landscaping plan is illustrated in *Figure 1.1.2*. The parking lot and walkways are approximately one acre, while the building footprints are also approximately one acre. The Federal Wetlands on the Wellness Center site is approximately 0.15 acres and is described in *Appendix 4.1*. The State Wetlands that include the Federal Wetlands is approximately 0.73 acres. The portion of the site that will be restored as State Coastal Commission Wetlands is approximately 2.9 acres (55% of the total area) as described in *Appendix 4.1*. The wetlands restoration allows for unique habitat integration with the urban development, while still providing the necessary barriers to protect the habitat.

The wetlands restoration and landscaping plan (see *Figure 1.1.2*) describes the expansion of the wetlands and riparian zone of the Pillar Point Marsh into the buffer zone and onto the Wellness Center property. The building foundations will provide a three-foot-tall hard edge to the wetlands restoration. The native riparian plants will blend into the edge of the facilities. The restored wetlands are surrounded by a willow waddle fence (a living fence constructed by woven willow shoots) that provides protection for the restored habitat and the residents. There will be an access trail that will accommodate foot traffic, wheelchairs, and emergency vehicles. Porous concrete planted with native grass will provide an ADA (American Disabilities Act) surface for wheel chairs, representing Big Wave’s unique integration of habitat and accessibility for the developmentally disabled. The lot coverage for the Wellness Center site is detailed in *Table 1.1.2.1*. The Building foot print is 51,000 square feet. The roofs discharge into rainwater gardens for ground water recharge and green house gas reduction. All surface runoff is collected and treated in the porous parking lot walkway infiltration system.

Table 1.1.2.1: Wellness Center Site Coverage

Impervious Surfaces:

| Facility | Area |
|----------------------------------|----------------------|
| BLDG 1 (Apartment Unit Building) | 19137ft ² |
| BLDG 2 (Breezeway) | 3511ft ² |
| BLDG 3 (Breezeway) | 3418ft ² |
| BLDG 4 (Storage) | 10014ft ² |
| BLDG 5 (Breezeway) | 3503ft ² |
| BLDG 6 (Breezeway) | 3503ft ² |
| BLDG 7 (Breezeway) | 3913ft ² |

| | |
|--|-----------------------------|
| Pool Building | 3464ft ² |
| Water Recycling Plant | 600ft ² |
| Total Impervious | 51063ft² |
| Pervious Surfaces: | |
| Facility | |
| Porous Parking Lot (Pavement 3) | 30721ft ² |
| Basketball Court, Recreation Area | 12601ft ² |
| Walkways (porous multipurpose trail) | |
| Pavement 2 | 3624ft ² |
| Pavement 4 | 1064ft ² |
| Pavement 5 | 243ft ² |
| Multipurpose Trail | 4280ft ² |
| Total | 9211ft ² |
| Total Developed Pervious | 52533ft ² |
| Total Improved Surfaces (not including Wetlands) | 103596ft ² |
| Total Wetlands Restoration | ft ² |
| Wetlands | 96749 ft ² |
| Access trail | 21434ft ² |
| Native Plant Nursery (temporary) | 8000ft ² |
| Total | 126183ft ² |
| Total Pervious | 178716ft² |
| Total Percent Pervious | 78% |
| Wellness Center Parcel Area | 229779ft² |
| Percent Wetlands Restoration | 55% |

1.1.2 Wellness Center Facilities

The Wellness Center Facilities are located between the airport overlay setback and the wetlands buffer zone. The airport overlay setback is the required distance setback from the airport runway approaches. Only parking, storage, commercial and industrial structures with occupancies of less than one person per 3000 square feet are allowed within the airport runway setback. As illustrated in *Figures 1.1.7* and *1.1.8*, the site plan includes a storage building. The storage building, rented out to the Coastside community, will provide a necessary source of ongoing revenue for the Wellness Center. The Wellness Center will have a habitat/security fence running along the airport overlay setback line. The security gate will have two lock box access points for fire vehicles. Public and residential access to the Wellness Center will be through the reception area located on the east side of the apartments. A recreation area, located south of the apartments, will include basketball courts, a pool and a fitness center. Along the western property line, a willow waddle fence (illustrated in *Appendix 4.4*) will be integrated into the wetlands restoration for security. Access to the restored wetlands will only be through the recreation area.

The floor plans are illustrated in *Figures 1.1.3* through *1.1.5*. The water recycling plant and agricultural water boosting station are located on the southwest corner of the site.

1.1.3 Wellness Center Residences

The Wellness Center will be a cooperative, owned by the residents, with the membership shares based on the number and type of units, the amenities of the units and the services to be provided to the residents. Other membership costs will include association fees (for maintenance and staffing), utility costs, and food expenses. The costs and the revenues are detailed in the Economic Analyses section of this Draft Facilities Plan (see Chapter 3.0).

As shown in *Figures 1.1.4a through 1.1.4l*, the residential units are both apartment style and single story style. The basic units for both the apartments and the single story are 14' by 24' single bedroom units with bathrooms. The apartment structures are three stories high, built around the community focal point, the recreation center. The first floor of the recreation center features a commercial kitchen as well as dining facilities that surround the pool area. The second floor of the recreation center has additional offices for Wellness Center staff and volunteers. The third floor includes a living room/recreation room and a multipurpose auditorium for performing arts, large meetings and movies.

The apartment units can be single bedroom units or two bedroom units. Living room and kitchen modules can be added onto the two bedroom units. The apartment units include: 31 one bedroom and bath (single module) rooms, 17 two-unit rooms (bedroom, bath with living/dining/kitchen option), seven four-unit/2 bedroom module units for staff. The apartment living units contain housing for 32 residents and 16 staff members.

The breakdown of the Wellness Center floor areas is illustrated on the following page, in *Table 1.1.2.2*.

| | |
|-------------------------------------|----------------------------|
| First Floor Areas | |
| Pool Room | 3464ft ² |
| Pool Equipment Room | 372.4ft ² |
| Men’s Locker Room | 372.4ft ² |
| Women’s Locker Room | 372.4ft ² |
| Fitness Center | 1117.2ft ² |
| Kitchen | 1488ft ² |
| Lobby | 1320ft ² |
| Dining Room | 2578ft ² |
| Offices | 1862ft ² |
| Dog Grooming | 372.4ft ² |
| Laundry | 744.8ft ² |
| Maintenance/Janitorial | 1489.6ft ² |
| Single Bed/Bath Unit (6 total) | 2234.4ft ² |
| Elevator/Stair Units (2 total) | 744.8ft ² |
| Double Unit / One Bedroom (3 total) | 2234.4ft ² |
| Hallways | 1834.2ft ² |
| First Floor Total | 22601ft² |
| Second Floor Areas | |
| Single Bed/Bath Unit (12 total) | 4468.8ft ² |
| Elevator/Stair Units (2 total) | 744.8ft ² |
| Double Unit / One Bedroom (7 total) | 5213.6ft ² |

| | |
|--|----------------------------|
| Hallways | 1834.2ft ² |
| Offices/Meeting Rooms | 5897.6ft ² |
| Second Floor Total | 18159ft² |
| Third Floor Areas | |
| Single Bed/Bath Unit (1 total) | 372.4ft ² |
| Elevator/Stair Units (2 total) | 744.8ft ² |
| Double Unit / One Bedroom (1 total) | 744.8ft ² |
| Triple Unit/Two Bedrooms (5 total) | 5586ft ² |
| Four Unit/Two Bedrooms (2 total) | 2979.2ft ² |
| Hallways | 2034.2ft ² |
| Offices | 744.8ft ² |
| Theatre | 2280ft ² |
| Living Room | 4690.8ft ² |
| Third Floor Total | 20177ft² |
| Storage Building | 20000ft² |
| Four Bedroom Breezeway (5 total) | 17848ft² |
| Total Wellness Center Building Area | 78785ft² |

The single story units (breezeway units) are broken down into similar single apartment bedroom units. A common area can be opened to the outside (an interior courtyard or breezeway) that can function as a living room, recreation room, or dining room. The breezeway units can include a kitchen unit. Five breezeway homes will be constructed from 20 bedroom modules and 4 kitchen modules. The breezeway homes will house 13 residents and four aides. In total, the Wellness Center will provide housing for approximately 45 residents and twenty staff members.

The construction of the Wellness Center will be wood frame modular construction that meets Platinum LEED standards. The chosen exterior finishes (a palette of colors and materials) are illustrated in *Figure 1.1.4m*.

1.2 Wellness Center Organization and Programs

The goal of the Wellness Center is to foster independent living in an economically and environmentally sustainable community. The program is all about the possibilities, not the disabilities. Big Wave will make possible a new lifestyle for the developmentally disabled community based on independence, community involvement, and self-sustained growth. The residents will have a chance to build their own community. They will be empowered by full inclusion into their surrounding communities. Big Wave residents will be offered new and exciting employment, as well as fun and stimulating recreational and social activities to enrich their lives.

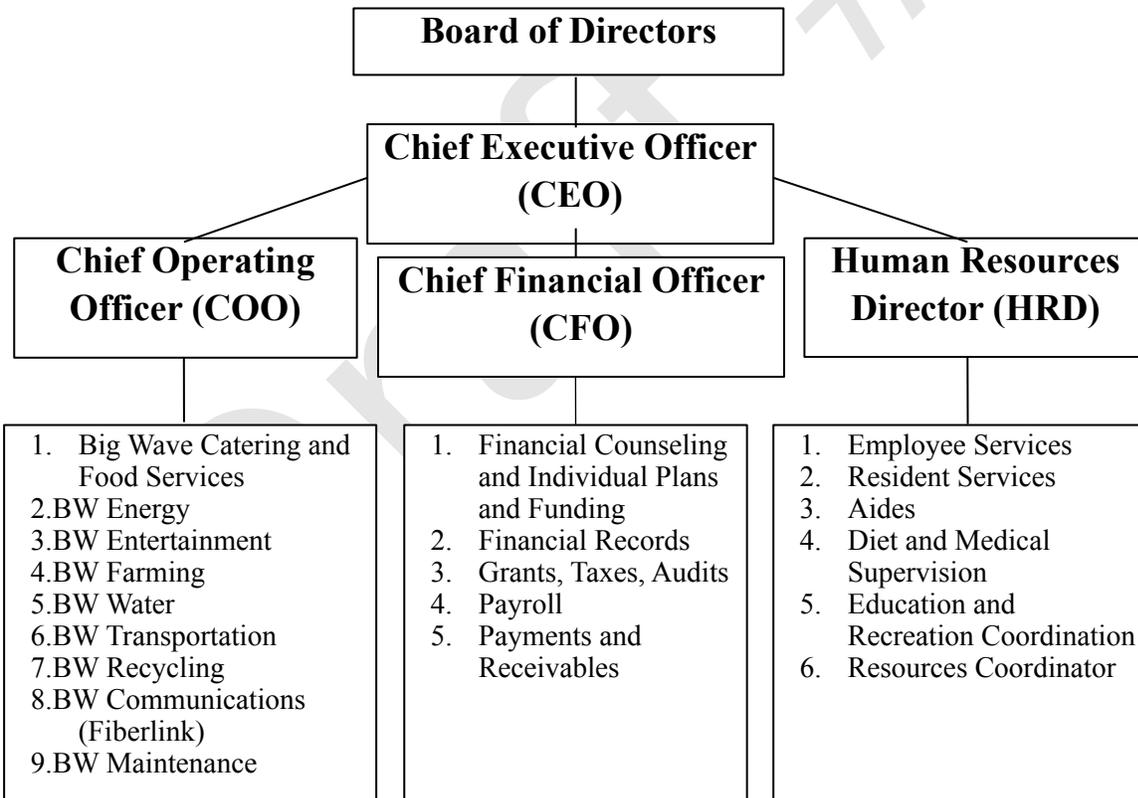
The Big Wave Wellness Center will offer its residents a variety of services. These services will encompass safety, well-being, quality of life, and educational needs. This project will accommodate for a great community need. Based on community feedback, the vision of the Big Wave Wellness Center accurately represents the needs of potential residents, as well as the needs of the community at large.

1.2.1 Bylaws and Board of Directors

The 5.25 acres of Wellness Center land and future Wellness Center will be administratively controlled by Big Wave Group, Inc., a certified 501(c)3 public benefit, non-profit corporation. The existing Board of Directors (three Directors presently) will appoint up to two more Directors after which the new Board composition may appoint up to four more Directors, for a total of nine Directors. The Board will be a cross section of financial, business, professional, educational, and community leaders, as well as experts in developmental disabilities. The purpose of the Board of Directors is to ensure that Big Wave’s Vision, Mission, Goals and Objectives are adhered to and to hire the proper Officers and Managers to cultivate a structure that will always strive to accomplish the Big Wave Mission. The Board is responsible for adhering to the corporate Bylaws and to create—with input from Managers, the Parent Advisory Board and the potential residents—the covenants and tenets that will govern all aspects of living in the Big Wave Community.

1.2.2 Staffing Organization Chart

Big Wave Wellness Center Organization



The organizational chart above depicts a picture of Big Wave after a maturation process that may take from one to three years. For example, in the start-up phase, one or two employees may take on responsibilities that, once Big Wave matures, would require six or seven positions. There are four main executive positions that will ensure the Mission of Big Wave is realized and perpetuated:

- *Chief Executive Officer:* The Board will directly hire the CEO. The CEO is the highest-ranking executive, in charge of the total management of Big Wave Group. The CEO

reports directly to the Board of Directors and is responsible for meeting the goals and objectives of the Board. The CEO will be responsible for hiring. He or she will be the direct supervisor of three executive or director positions: the Chief Operating Officer, the Chief Financial Officer and the Human Resources Director.

- *Chief Operating Officer:* The COO, who reports directly to the CEO, is responsible for managing the day-to-day activities of Big Wave. The COO's focus is strategic, tactical and short term. It is the COO's role to determine the feasibility of any potential businesses at Big Wave, as well as to monitor the on-going success—financial as well as cultural—of all businesses and operations.
- *Chief Financial Officer:* The CFO, who reports directly to the CEO, works in concert with the CEO and HRD. The CFO is responsible for determining and managing the financial risks and rewards of Big Wave. The CFO is responsible for all financial planning, grants management, budgets, book-keeping, analyzing financial aspects of proposals, as well as financial reporting.
- *Human Resources Director:* The HRD, who reports directly to the CEO, ensures that employee and resident needs are being met and met well. The HRD directs all the resident services, proposes services to be added or cut, sets compensation for caregivers, and is responsible for staff morale and benefits. The HRD represents the soul of Big Wave. This multiplicity of tasks requires individuals with strong organizational skills who can quickly shift from project to project, problem to problem.

1.2.3 Employment Options and Skills Training

The Wellness Center will own and operate a number of business operations that will employ residents, provide residential services and, in some cases, generate revenue to maintain the economic sustainability of the Wellness Center. A few examples include: Big Wave Energy, Big Wave Farming, Big Wave Catering, Big Wave Maintenance Services, Big Wave Water Utilities, Big Wave Transportation, Big Wave Entertainment, Big Wave Recycling and Big Wave Communications. These businesses can provide employment for over 80 developmentally disabled (DD) individuals.

The Chief Operating Officer will initially start the Wellness Center businesses, proceeding to hire managers for the businesses once businesses are functional and generating jobs and revenue. Each manager will function under set goals and criteria for services and revenue. Revenue will be applied to reduce the housing and service cost for the residents. Managers will be responsible for training the residents to perform the jobs that are developed.

Big Wave Energy will include up to 200 to 300 kilowatts of solar voltaic, one to three million BTU/hr of solar heating, one million BTU/hour of geothermal cooling, and up to 100 kilowatts of wind power. It will also own and operate up to a 600 kilowatt biodiesel backup power unit designed for energy peak saving and 15 kilowatts of hydrogen fuel cells for backup DC communications.

Big Wave Farming will farm up to 20 acres of row crops, a five acre native plant nursery, and a 50 acre sustainable farm. The farm will include free-range poultry for organic eggs and fryers; free-range livestock for organic milk, yogurt and ice cream; and hay and vegetable crops.

Big Wave Catering will operate a lunch service deli, assemble farm produce baskets, create catered meals for the office park and community, and provide food services for the residents. They will sell Big Wave's free-range chickens, eggs, yogurt and ice cream for restaurants and stores. They may also operate a weekly Farmer's Market in the Office Park parking lot. Big Wave Catering may open an organic yogurt and ice cream store.

Big Wave Maintenance Services will provide maintenance services for the Office Park, Wellness Center and business operations. They can also provide laundry services for the Office Park and Wellness

Center. Maintenance services can be expanded into surrounding marine, residential and commercial facilities.

Big Wave Water will operate the potable water distribution for the Wellness Center and the Office Park. The private water distribution system, owned by the Big Wave Group, will include fire suppression, potable water, recycled water, agricultural well water, wetlands restoration water, and irrigation water. The potable water will either be purchased from Coastside County Water District (CCWD) if available or reverse osmosis treated agricultural water if CCWD water is not available. The agricultural irrigation will be infiltrated rainwater, agricultural well water, and recycled gray and black water.

Big Wave Entertainment will provide educational and recreational opportunities for the residents and community. Programs can include special run movies, nature walks, camping trips, conferences, vacation packages, sports programs, sailing and water sports, etc.

Big Wave Transportation can charge for event parking, parking at the Office Park and provide bus services for the residents and commuters. They can also provide transportation to off-site events, places of employment, and transport of food and produce to market. Big Wave Transportation may utilize employees and its own equipment or use contractors.

Big Wave Recycling will help encourage the purchase of recyclable materials and supplies for the Wellness Center and Office Park. They will recycle all metal and paper. They will operate a composting operation for food and landscape waste. Compost that meets organic standards will be used in the farming. Non-organic compost will be used in landscape operations. Compost and recyclables can be marketed.

Big Wave Communications will provide Internet and telephone communications for the Wellness Center and Office Park through its employees and contractors. It will provide a microwave radio tower internet link to a main server connection link in Silicon Valley. This will provide a marketable redundant communication link for the entire Coastside community.

1.2.4 Food Services

Big Wave Wellness Center will accommodate a fully functional, commercial quality kitchen and dining facility. Meals will be prepared by the residents. The Chief Operating Officer will be responsible for the management of a trained Chef/Dietician. Big Wave Wellness Center will provide two meals daily, as well as nutritional guidance and education for the residents. Meals will be prepared based on the dietary needs of the residents. Individuals may sign up for a full or partial meal plan.

Residents will be able to access the kitchen facilities under the guidance of the chef and/or support staff. Residents with partial meal plans will have to sign up for meals in advance to accommodate the kitchen schedule. Custom meal plans will be available for those with special diet requirements. Food Services will coordinate the sale of dairy, produce and poultry, and manage the lunch box catering business. Food service may also coordinate the operations of the Farmer's Market.

Residents will have options regarding food choices on a weekly basis, and will have input into the variety of meals prepared.

1.2.5 Recreational/Educational Services

Big Wave is not a service provider. Big Wave will work with Coastside Hope Services and other service providers to give its residents an innovative, educational, diverse program of recreational activities. The Human Resource Director (HRD) will be the primary manager of the recreational and

educational services. In addition to providing recreational and educational services to residents, these services will also operate a revenue-generating program that could include community movies, water aerobics, swim lessons, sailing lessons, retreats, outings and vacation packages for the residents and the community.

The HRD will coordinate and utilize a combination of part-time staff, community volunteers and community programs to give the residents a wide range of fun and healthy activities to engage in when they are not at their day programs or places of employment. Some of the activities that both families and potential residents have suggested are as follows:

- Hiking excursions in Half Moon Bay and the greater Peninsula
- Bicycling on the coast
- Movie nights out with community volunteers such as *C-PALS* (Coastside Parents Action League for Special Needs Kids and Adults), *Got Friends*, and personal mentors
- Weekend trips to Santa Cruz and various regional points of interest
- Community theater involvement
- Altruistic work involving the senior population or other groups in need (*Meals On Wheels*, community center volunteer work, reading with seniors, *SPCA* involvement, and Chamber of Commerce participation)
- Girl's night out/boy's night out with mentors/volunteers, (*Big Brother*, *Big Sister*)
- Potlucks and/or progressive dinners
- City of Half Moon Bay Recreational Department activities
- Summertime kayaking
- National and international excursions
- Hosting visitors for retreats and coastal lodging
- Surfing and sailing lessons

Coordinating the recreational activity program will fall under the direction of the Human Resource Director, who will work closely with members of the Coastside community and Big Wave residents to foster 100% community inclusion. We have a wide array of skilled people to draw from: senior citizens, high school upperclassmen seeking to fulfill community service obligations, local university students looking for internship opportunities and good Samaritans in our community seeking fun and fulfilling opportunities.

1.2.6 Cooperative Housing

Big Wave Wellness Center is a cooperative housing project for developmentally disabled individuals. The goal is to provide affordable housing that the residents will own themselves. The cooperative model was selected because it provides the flexibility to change residences within the complex without an official real estate transaction to change the title and deed. The cooperative model does not require a detailed ownership subdivision. For example, if a resident initially owns the shares for a second story, one bedroom apartment and desires to move to a unit with a living room or a breezeway unit, it can be done by purchasing more shares and moving into an available unit. Also for aging residents that may require aides, an additional bedroom unit can be obtained.

The cost for a unit will be based on the size and location of the unit and the unit amenities. This is the "co-op share" and, essentially, the mortgage cost. Additional costs will include an association fee that will fund maintenance costs, insurance costs and staff costs. There will also be utility costs and food services costs. The financial section of the Facilities Plan explains how many of these costs can be reduced and deferred. To determine the Co-op share and to order a unit, a prospective resident will fill out a form similar to *Figure 1.2.6* (see next page). Service options will be based on the selected food plan, as well as the staff and attendant requirements. Food plans will be full, partial or custom. Attendant requirements may be based on a shared attendant and the cost of the attendant will also be shared.

1.2.6.1 Floor Plan Options

There are two main floor plan options. The breezeway option is a single story home with shared living space and is more suited for independent living. The apartment units can be a single bed and bathroom unit or can include an additional living room, bedroom and kitchen. These units are well suited for living with attendants or aides. The third floor apartments are designed for staff housing.

1.2.7 Individual Assistance

The CFO and/or the Financial Advisor will assist each resident in developing an individualized financial plan to cover the cost of fees, services, and their mortgage. The financial advisor will have full knowledge of State and Federal grants and subsidies, Regional Center funding, grants from private foundations, Big Wave revenue, and State and Federal Tax laws.

1.2.7.1 Financial Planning

The CFO or the resident's appointed financial aide will assist the residents in handling checking, savings, and cash flow accounts. The residents are responsible for the cost of their services and mortgage. The CFO or their appointed financial aide will assist in the assembly of Big Wave revenue, State and Federal funds, and private donations to defer the living costs. The remainder of the funds not covered by the grants and subsidies will be the responsibility of the resident. It will be a goal of Big Wave to cover most of the residential costs for a basic unit and basic level of services. Big Wave will offer a number of employment opportunities for its residents, allowing them to make their own spending money. Money and payments will be managed by the Financial Advisor to protect SSI and minimize tax payments.

1.2.7.2 Special Aides

Big Wave realizes that many potential residents require either a full-time or part-time aide to support them in their day-to-day activities. The families/conservators of the residents will work closely with the Big Wave executive team to hire and manage aide support for the residents.

Big Wave will hire aides based on resident requests, recommendations, and funding. Residents can share aides. The amount of share can be adjusted annually and vary from 10% to 100%. Those residents requiring aides will be clustered together. The aides will ensure a regular routine for residents including disbursement of medication, personal hygiene care, etc. The aides will provide a certain amount of nighttime security and be accountable for the residents under their care. Aides will be approved by the residents and/or their legal guardian as well as the Board of Directors. Waivers will be signed limiting the aides' and Big Wave's liability.

1.2.7.3 Counseling Services/Conflict Resolution

Counseling and conflict resolution will be provided by the Regional Centers and the San Mateo County Mental Health Services. The Human Resources Director (HRD) will assist in obtaining these services and direct residents to the appropriate agencies if the resident has need to access these services. The HRD will also oversee and manage on-site peer mentoring and staff counseling to resolve issues between residents as required.

1.2.7.4 Dietary Planning

The Chief Operations Officer (COO) will be responsible for the management and hiring of a Chef/Dietician who will work with the residents and their medical plans to prepare meal plans for each resident. Under the supervision of the COO, the Chef/Dietician will coordinate food requirements with the Big Wave Farm's goals and schedules.

1.2.7.5 Health Care

The residents will be required to provide for their own health care. For example, if a resident requires a full time nurse or medical aide, that will be part of the resident's responsibility

and cost. The Chief Financial Officer and the Chief Executive Officer will support and assist the residents in whatever manner feasible.

1.2.8 Security

The Wellness Center will have a Reception office for secure access for non-residents. Aides will function as monitors for their floors. Two card-lock gates will protect residences and interior spaces. Additionally, the reception office will be secured with card locks. The card locks will identify the residents and their activity. There will be no security guards, yet there will be staff members available full-time. The focus of Big Wave is independent living, not institutional living.

1.2.9 Staff Housing

Staff housing can be provided for the Chief Executive Officer, Chief Financial Officer, Chief Operations Officer and the Human Resource Director. These would most likely be multiple bedroom units on the third floor. Other staff housing may be provided as available and as needed. Housing will be provided for aides.

1.2.10 Conclusions: Wellness Center Organization and Programs

In conclusion, Big Wave will provide a new model for a full and enriching life for people with developmental disabilities. The residents of Big Wave will experience community inclusion and sense of purpose within society on a level one has yet to see fulfilled. Big Wave will break down barriers and allow the general community to get to know, respect and value these wonderful people for their individuality and uniqueness. We hope that Big Wave will allow everyone to see all the possibilities people with developmental disabilities have to offer the world.

1.3 Office Park Facilities Description

The Office Park site is located on 14.253 acres. It will be comprised of four, three-story buildings, as shown below in *Table 1.3.1*.

| Table 1.3.1 Office Park Site Coverage | |
|--|----------------------------|
| Impervious Surfaces: | |
| Facility | Area |
| BLDG 1 | 19500ft ² |
| BLDG 2 | 19500ft ² |
| BLDG 3 | 19500ft ² |
| BLDG 4 | 19500ft ² |
| BLDG 5 (Communications Building) | 2000ft ² |
| Building Footprints | 80000ft² |
| Pervious Surfaces: | |
| Facility | Area |
| Porous Parking Lot | 243925ft ² |
| Total Walkways= | 13052ft ² |

| | |
|--|-----------------------------|
| Islands/Sidewalks | 18065ft ² |
| Infiltration System (Pervious Hard-surface) | 314803ft² |
| Restored Wetlands | 226038ft ² |
| Wetlands Trail | 39761ft ² |
| Total Wetlands | 265799ft² |
| Total Pervious Surface | 580602ft² |
| Total Office Park Area: | 620841ft ² |
| % Pervious Surface | 94% |
| % Office Park Wetlands Restoration | 43% |
| Total Wetlands Restoration (both apn) | 391982ft² |
| Total Area (both parcels) | 850620ft ² |
| Total Restored Wetlands | 46% |

The four proposed Office Park buildings will have first floor footprints totaling 78,000 square feet. The maintenance Communication Building will have a footprint of 2,000 square feet, bringing the total building footprint for the Office Park to 80,000 square feet.

Roof runoff will be treated by rainwater gardens. Seven and 2/10 of an acre of porous concrete flatwork is designed at a rainwater infiltration system designed for ground water recharge. Including the 6.1 acres of restored wetlands, the total pervious surface is 13.3 acres or 94% of the site. A total of 43% of the site is restored as wetlands. The site plan is presented in *Figure 1.3.1*.

The proposed Office Park is a 225,000 square foot mixed use office park comprised of the following area breakdowns, as described below in *Table 3.2.2*

| Proposed Use | % Area | Area |
|---------------------|---------------|-----------------------------|
| General Office: | 40% | 90000ft ² |
| Research and Devel. | 25% | 56250ft ² |
| Storage: | 15% | 33750ft ² |
| Manufacturing | 20% | 45000ft ² |
| Total | 100% | 225000ft² |

The proposed Wellness Center and 225,000 square foot Office Park do not require any offsite mitigation for traffic. This alternative requires an exception to the San Mateo County parking ordinance. The current ordinance requires one parking space for each 200 square feet of office space. The exception requests one space for each 250 square feet of equivalent office space. This is a less conservative, more reasonable figure, in line with parking practices in most cities in San Mateo County. The Office Park will have 640 parking spaces. The project does not require offsite mitigations and is consistent with all Federal, State and Local laws and ordinances.

As illustrated in *Figure 1.3.2a and 1.3.2b*, the restored wetlands and riparian zone is approximately 6.1 acres or approximately 43% of the total area. Including the Wellness Center restored

habitat, the total wetlands/riparian zone restoration component is approximately 47% of the total property area. The building elevations are illustrated in *Figures 1.3.3 through 1.3.8*.

A driving project goal was to minimize the building footprint in order to maximize the restored wetlands area. Another goal is Platinum LEED Certification. The Office Park will face south, efficiently utilizing active and passive solar energy. The energy goal is 100% renewable with the majority of the energy generated on site, including active and passive geothermal energy and wind energy. This project is a model of how to integrate restoration and environmental protection into urban design plans.

Techniques include:

- Infiltration ponds that recharge the groundwater table with clean rainwater from the roofs
- Treatment of parking lot runoff for oil grit and biological components to support the wetlands restoration
- Elevated concrete walkways and seating wall designed to separate aquatic biology from activity in the parking lot
- Porous concrete parking lot and walkways designed as ground water infiltration systems

The Office Park will have access to local utilities including PG&E for power, AT&T and Pacific Bell for communications, and Comcast for cable. There will be a local power distribution system with solar as the primary source. The electrical energy systems will have backup bio-fuel power generators for the entire facility. Energy costs will be guaranteed at rates lower than commercially available power. Electrical power will be available at high, medium and low voltage. Both DC and AC backup are available. Heating will be solar. Cooling will be geothermal. Water and solid waste will be recycled and used in the farming operation.

The adjacent Wellness Center will provide building and utility maintenance and operation, landscape services, drop off and pick up laundry services, catered food, farm produce boxes, pet care and walking services, and swimming and exercise programs for adults. The project incorporates a public walking trail for jogging and observing the native California wetlands habitat.

1.4 LEED Certified Construction

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is a third party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED certification provides verification that a building project is environmentally responsible, profitable and a healthy place to live and work.

It is Big Wave's goal to LEED certify the project at the Platinum level. The LEED for Core and Shell checklist for Big Wave is provided in *Appendix 1.3*. This initial checklist indicates that the project qualifies for Core and Shell Platinum LEED Certification.

To achieve environmental sustainability, the Big Wave Project will pursue the following:

- Obtain Platinum LEED certification
- Offset the conversion of farmland to development, with 25 acres of leased land in the airport zoned industrial for permanent high yield farming with recycled water
- Pursue alternative transportation options
- Construct bicycle storage and changing facilities
- Provide priority parking for low-emitting, fuel-efficient vehicles (5% of total parking spaces)
- Create efficient parking
- Restore natural habitat
- Maximize open space and exceed County Planning Department regulations with over 57% of the Wellness Center site restored as State Designated wetlands and over 45% of

the Office Park site restored as State Designated wetlands. Over 47% of the entire site will be restored as wetlands.

- Significantly reduce existing impermeable surface (proposed project has less than 25% permeable surfaces).
- Maximize storm water infiltration and native plant evapotranspiration.
- Create permeable pavement with high reflectivity and porous, open grid design
- Install solar panels on all roofs. Solar panels absorb heat energy and convert it to electricity and building heat, reducing the building and roof temperatures.
- Install wind power system.
- Install minimal outdoor lighting and paths laminated with three-foot-tall bollards.
- Provide tenant guidelines for energy efficiency and environmental protection.
- Landscape with native plants that do not require water or maintenance once mature. Use only recycled water to irrigate landscapes.
- Exceed the usage amount of implemented ground water recharge systems
- Reduce water consumption by 30% with recycled water used for toilets Certify energy systems through LEED. The project goals may be as high as producing all of the buildings' energy onsite.
- Cool building geothermally and without refrigerants
- Recycle over 50% of the construction waste, ultimate goal is 75%.
- Use recycled materials to construct buildings: at least 1% with a goal of 20%. Crushed recycled concrete for base rock is approximately 20%.
- Use 20% locally processed and produced materials (possible with concrete tilt-up buildings)
- Limit smoking in the buildings
- Air condition buildings with controlled outdoor air
- Exceed ventilation standards by 30%
- Use only low emitting materials. Adhesives and sealants will be avoided.
- Implement an Indoor Air Quality management plan during construction
- Minimize use of high emitting paint, carpets, and composite wood or fiber
- Design buildings to incorporate chemical and pollutant source control
- Design and incorporate thermal comfort by way of opening windows and individual thermostats
- Incorporate a minimum of 2% glazing on windows and light buildings with 75% natural daylight
- Create occupied spaces with scenic outside views (over 90%)
- Employ LEED accredited professionals, focusing on a certified innovative design process

1.5 Wetlands Restoration

Approximately 46% of the property (9 acres) is dedicated to wetlands restoration. Dr. Lyndon Lee and Dr. Peggy Fiedler are the chief designers of the wetlands restoration. Their design is included in *Appendix 4.4*. Both Lee and Fiedler have extensive wetlands restoration design experience on the San Mateo County Coast. Working with a grant from the Environmental Protection Agency, they developed the Hydrogeomorphic Model (HGM) based on detailed studies of the hydrology, botany and geomorphology of 26 streams and creeks along the San Mateo County Coast. The HGM model allows for design and monitoring based on regional references. This model has been adopted by the Corps of Engineers for both design and modeling. Dr. Lee and Dr. Fiedler's resumes are included in *Appendix 4.5*.

To ensure successful plant growth, organic loamy soils will be collected from the surface of the non-restored portion of the site and placed in the area to be restored. The restored area will be carefully graded to a rigosity similar to watersheds with comparable hydrology. The planting incorporates native plants in polygons planted appropriately with the designed hydrology. Approximately 30,000 plants will be grown in pots in a native plant nursery constructed on site. After planting, the site will be irrigated and

maintained according to the approved monitoring plan. Key features in the restored wetlands include micro-depressions designed to capture runoff and roof infiltration. The micro-depressions support biodiversity. *Figure 1.5* illustrates the design for the micro-depressions.

1.6 Alternative Energy

A project goal is to supply the majority—if not all—the energy for heating, cooling and electrical demand with renewable energy. It is our intent to maximize onsite power generation. It is also a goal to provide power for both the Office Park and the Wellness Center at the lowest possible rates. The possible onsite power systems include solar heat, photovoltaic panels, wind generation, cogeneration with biodiesel peak shaving, and geothermal cooling. Passive heating and cooling are also a focus of the architectural design. The electrical equipment cooling process is also a source of building heating. Fuel cells will be utilized for the backup communications power. We will investigate the cost benefits of nighttime hydrogen generation when power is inexpensive. A Big Wave Energy schematic is shown in *Figure 1.6*.

1.6.1 Electrical Power Distribution

As discussed in Chapter 8, the lowest cost rates for power are based on PG&E Rate Sheet A10. The main power feed will be to an outside transformer located next to the communications building. From this point, separate private meters would be required for each separate user. The meters would be electronically read and billing would be electronically issued by the homeowners association or the Wellness Center business office. The single high voltage meter for the whole complex will reduce the power costs by approximately 10% for all users. A single high voltage meter allows the purchase of bulk power at negotiated prices which reduces the power costs. It would also allow all of the tenants to share the benefits of solar and wind power and provide backup power with one generator. The generator could peak shave and co-generate heat for the building. The main meter would be a “time of use” meter, charging and paying for power at different rates depending on the time of day. For example, peak rates in the future from 3 pm to 6 pm in the summer may be 10 times as high as average rates and up to 30 times as high as nighttime rates. Smaller individual meters owned by Big Wave may also be provided.

The onsite power distribution grid is shown in *Figure 1.1.1* and *Figure 1.3.1*. There will be a joint trench owned by the public utilities and the private trench owned by Big Wave. The private trench will have a distribution conduit for Big Wave Power (common metered) and PG&E power (utility metered). Tenants will have the choice of power suppliers.

1.6.2 Photovoltaic Solar Electrical Power

Photovoltaic power is generated when photons strike a surface that allows an electron to be released and captured into a circuit. The most common photovoltaic systems are silicon wafers in panels that collect the electrons through a foil on the back of the wafer and distribute DC power to an inverter and transformer. The electrons are then returned to the panels forming a circuit. The transformed power is fed into the local grid and meter. If the power produced exceeds the power utilized, the meter turns backwards and PG&E pays for power at the going rate.

The silicon wafers—key to photovoltaic (solar) power—are expensive to make and limited in supply. Other technologies, including films and synthetic sheets, are currently in development. Big Wave will install the most cost effective method of photovoltaic power that is available within the next few years.

There is approximately one acre of roof on the Wellness Center available for power generation, enough to generate peak power of approximately 150 kilowatts and an average of approximately 50 kilowatts over an 8 hour period. This system will cost approximately \$1.5 million to install. The system

will require approximately 750 panels and occupy a roof area of approximately 9,000 square feet. Each panel measures 3' x 4' and generates 200 watts at 68 volts.

The Office Park has three acres of roof space. This roof space is capable of generating 450 kilowatts of peak power and an average of 150 kilowatts over an 8 hour period. The cost to install this system is approximately \$4.5 million. The system will occupy about 30,000 square feet of roof space and include approximately 2,200 – 3 foot by 4 foot panels.

The roof space is the only practical location for solar panels. All the remaining space on the property is dedicated to wetlands restoration or ground water infiltration and parking.

Solar power can only be installed with one PG&E meter per system. PG&E will not pay for generated power that exceeds the power used. Therefore, power users are discouraged from generating surplus power. This presents two alternatives for solar power installation.

The first alternative is to allow for a number of smaller solar systems individually owned by the tenants. This alternative will include the system owned by the Wellness Center and a number of systems owned by the Office Park tenants. For this alternative, the system installed at the Wellness Center will be a 50 kilowatt system instead of the 150 kilowatt system mentioned above. All of the solar systems will be about 2/3 smaller for this alternative. To allow for individually installed systems at the Office Park, the roofs would have to be owned by the Tenants Association.

The second alternative would involve common ownership of the solar system. A one meter system would allow a large solar system for the Wellness Center. Common ownership could be broken into two ownerships, one being the Wellness Center and the other being the Office Park Tenants Association. This may allow for the Wellness Center to sell electricity to the Office Park and vice versa.

The availability of grant funds will most likely determine the size and type of solar system. With current power rates, an unfunded solar system is not yet cost effective. The following funding mechanisms will be considered:

- Funding the entire system through legislative act, current rebates, credits and grants. The next step will be to have the Office Park donate the Wellness Center system to the 501(c)3, Big Wave Group, Inc. This alternative may fund the entire system.
- Funding the two separate portions of the system through existing grants, rebates and credits. This funding mechanism will fund approximately 30% of the system.

The proposed project will be based on a roof mounted 600 kilowatt system. This system will be constructed in phases based on the available funding. The details of the system are provided in *Appendix 8.6*.

Using current silicon technology, photovoltaic panels can produce electricity for approximately \$0.20 to \$0.25 per kw-hr. The goal of thin film technology (currently being developed) is to produce power for \$0.05 per kw-hr. With current solar technologies at 30% project funding, the cost of producing power will be \$0.14 to \$0.17 per kw-hr. At current energy costs, the project will not pay for itself. At 50% funding, the project pays for itself in about 10 years (if the cost of energy stays the same). If the project is 50% funded and the cost of energy doubles, the project will pay for itself in approximately five years. If the project receives 70% funding, the project pays for itself in seven years. If the project is 70% funded and the cost of energy doubles, the project will pay for itself in three years. After the project is paid for, it will generate revenue for 25 to 30 years. A project goal is 70% funding.

1.6.3 Solar Heating

Buildings will be heated by either natural gas or solar power. Natural gas costs have increased about 60% since last year. Solar heating is a cost effective way to provide building heat, especially if

grants and rebates are available. The Wellness Center requires that approximately 70,000 square feet be heated. The Office Park will require approximately 150,000 square feet be heated. For a well-insulated building, heat loss is about 0.2 BTU/hr/sq. ft./F°. Heat requirements for the Wellness Center will be approximately 5 million BTU per day for a 15 degree temperature difference. A gas heater (50% efficient) will require 100 therms per day to maintain the building heat. At current energy rates, the gas costs for the Wellness Center will be about \$70,000 per year. For the Office Park, the gas costs will be about \$140,000 per year.

Solar heat costs approximately \$2 per watt to install. The cost for an evacuated tube system will be about \$600,000 for the Wellness Center and approximately \$1,200,000 for the Office Park. If gas rates do not increase, the payback period for the proposed systems for the Office Park and Wellness Center will be about 10 years. If the system is grant funded, the payback period will be less than five years. *Appendix 8.6* includes information about evacuated tube systems.

Big Wave will design a geothermal cooling system. This system will circulate a cooling loop under the foundation slabs to transfer heat into the soil mass. We will also utilize irrigation and well water for cooling.

1.6.4 Hydrogen Fuel Cells

Hydrogen fuel cells will provide backup DC power for the communication system. If hydrogen production becomes cost effective, producing hydrogen during off-peak hours (when electricity is inexpensive) is another form of storing power for peak usage. Current hydrolysis equipment is about 40% to 50% efficient. This type of generation becomes practical if off-peak rates for electricity are significantly lower than on-peak rates.

We propose the installation of a 5 kW molten carbonate fuel cell, as illustrated in *Appendix 8.6*. Molten carbonate fuel cells do not require stored hydrogen. They operate with natural gas. The molten carbonate element is heated with natural gas. The hydrogen atoms in natural gas (CH₄) pass through the element generating DC current through the cell and water. The manufacturer's cut sheet is provided in *Appendix 8.2*. The fuel cell will serve as a backup to the DC power supply. For peak power shaving, the fuel cell will operate during peak power periods in the summer months. We plan to collect and gather excess heat into the building heat system, thus increasing the power cell efficiency to 85%.

1.6.5 Biodiesel Backup Power and Cogeneration

Emergency power will be provided by a biodiesel engine. If permitted by the Bay Area Air Quality Control District, the engine will provide peak power shaving during times when utility power is scarce. The engine will also provide building heat. Backup fuel storage will be in the Communications Building (in the form of a double contained stainless steel vegetable oil tank).

1.6.6 Wind Power

Wind power turbines will be installed around the solar panel racks for both the Office Park and the Wellness Center. The turbines will be located primarily on the north and west faces of the roofs. The wind turbines will be the same height as the solar roof racks. The turbines will be located in a screened in box that rotates to face the prevailing wind direction. The box and the screen will keep birds from being hit by the rotating blades. Since the turbines match the height of the proposed solar panels, they will not cause any additional habitat hazard or visual impact. The turbines will be medium/low speed and generate minimal noise. Approximately 50 to 100 kW of wind turbines will be installed. The design is illustrated in *Figure 1.6.6*.

1.7 Communications and Technology Network

Telephone provided by Pacific Bell, Internet provided by AT&T and cable provided by Comcast are available in an underground system installed in Airport Street. These systems will connect to the Communications Building located on the southeast corner of the Office Park site.

Big Wave Communications will leverage a high capacity, redundant, renewable-energy powered telecom link to provide significant Internet and data transmission capabilities to the Office Park and Wellness Center (see *Figure 1.7*). This telecom link will connect to two microwave dishes located on the east face of the Communications Building. Big Wave Communications will hardwire the communication links to all buildings through a private communications duct bank. All offices and residences will have the option of hardwire phone, cable and Internet. Big Wave Communications will also offer Wi-Fi for the residences and offices. The communications building is an unstaffed maintenance building that houses the main electrical distribution system, backup power, PacBell, AT&T and Comcast service connections. The two 36" radio dishes will be located at the east building face and not penetrate the roof top with a tower. The dishes will face Montara Mountain. The location and orientation is such that public exposure to radio waves will be minimized.

The proposed Big Wave telecommunications link is a wireless based link that will connect the development with the greater Bay Area internet exchanges and overall global internet. This link can serve as either primary service or back-up service to the fiber optic facility that enters the market via shared paths.

Key features:

- An aggregate of over 350 hundred megabits of Tier 1 Internet access (highly desirable for high tech companies in the Office Park).
- Carrier class link with full redundancy to the current telephone company service.
- Link will operate in FCC licensed space.
- Communications facility will consume very little energy (10 amp continuous maximum).
- Link will be 65% powered (two of the three hops) by solar and wind energy. Remaining pieces of the link will consume small amounts of energy and will use shared HVAC and power where possible.
- Link will be fully managed and monitored 24 hours a day/7 days a week/365 days a year.
- Link will be capable of delivery of voice, data transmission and Internet services.
- Link can act as back-up link for PCS/Cell provider backhaul and for local/regional broadcasters.
- Link facility and its point of presence at the development will have redundant power and redundant control and data systems.

This link can be leveraged by other Half Moon Bay and Princeton area businesses and organizations. Since this link is a complete bypass of the local telecom systems, it provides excellent disaster recovery capabilities.

1.8 Solid Waste/Recycling Program

Big Wave Wellness Center will develop a composting program for all food, shredded paper and yard waste. This compost will be applied as a soil amendment in the farming and landscaping operations. Both the Office Park and the Wellness Center will have recycling centers for plastic, paper, glass, cans and metal. Each building will have garbage storage and recycled storage (including food waste). There will be two pickup points for Allied Waste in the Office Park parking lot and one pickup point for Allied Waste in the Wellness Center parking lot. The project goal is to recycle 95% of the solid waste produced onsite.

1.9 Sustainable Organic Farming and Native Plant Nursery

Committed to the continuation of farming and native plant restoration on the Coastside, Big Wave is currently constructing a native plant nursery that will house 30,000 pots under irrigation. The first generation of plants from the nursery will be used to restore 47% of the property that was native wetlands prior to historic farming. This nursery will continue to supply about 15,000 to 30,000 native plants per year for restoration projects along the coast. A Big Wave Farming schematic is available in *Figure 1.9*.

To continue the tradition of farming along the coast, Big Wave is in the process of negotiating two long-term land leases. One 50-acre lease in Half Moon Bay will be for sustainable organic farming and livestock. This land is in Purisima Canyon and is part of the Big Wave Wellness Center operation (but not part of this construction project). The second 25-acre land lease will be for Organic row crops irrigated with recycled well water. This land is located immediately to the east of the Big Wave site. The land is occasionally dry farmed. The soils at the Big Wave site and the soils in the proposed 25 acre expansion are not prime soils for farming. The soils adjacent to the wetlands have an adequate Organic loamy characteristic. However, the majority of the soils on the project site are comprised of inorganic clayey silts with poor permeability. The project's intent is to increase the agricultural production with recycled water irrigation and the addition of organic compost. The "Organic" certification with recycled water is novel and groundbreaking. The land is zoned industrial but is in the immediate approach to the airport runway and the likelihood of development is remote. The 25-acre lease will be part of the Big Wave Environmental Impact Report.

It is intended that the Organic farming operation will provide the majority of the food for the Wellness Center. This is a sustainable, healthy food source that will provide about 15 jobs for the Wellness Center residents and ten jobs for the community. The Big Wave Farm will support a catering business for produce and dairy that will operate through the Big Wave kitchen. The Big Wave agricultural program may operate a Farmer's Market selling organic produce grown on the coast, as well as free-range eggs, organic yogurt and ice cream.

The 25-acre lease will support three growing seasons of beans, peas, pumpkins, squash, peppers and corn. The 50 acres will be broken down into 5 – 5 acre fenced paddocks and farmed in a sustainable rotational pattern. Fifty acres of surrounding forest will be maintained for biodiversity. The farm will be managed by sustainable, traditional methods that include using cow and chicken manure for soil enrichment, alternating crops, letting fields lay fallow for a season, composting and more. All crops yielded will be "Organic."

This operation will be capable of generating about 5,000 dozen eggs per year; 1,000 pounds of organic free-range chicken; 2,000 gallons of organic milk from free-range cows; 1,000 gallons of organic yogurt; 1,000 gallons of ice cream; and five tons of fresh produce. This food will supply the Wellness Center kitchen with any excess being sold through the farmers market and through delivery (as produce/dairy baskets) to the Office Park and the Coastside community.

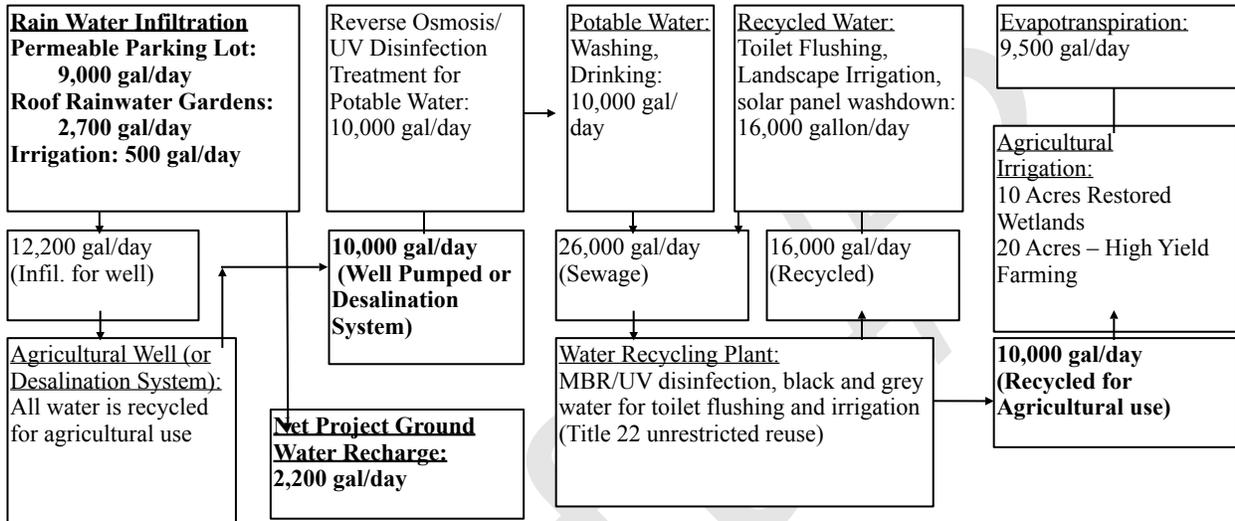
1.10 Water and Wastewater Resource and Reuse

Big Wave proposes to annex into the CCWD Water District and work with CCWD to generate onsite water and provide water recycling for the majority of the wastewater. All wastewater not recycled will be discharged into the El Granada Sanitary District. Water generated onsite will include the Big Wave Well for Irrigation, cooling and domestic supply during above normal rainfall years. During drought years, Big Wave will desalinate seawater. Domestic well water will be treated with membrane micro filtration followed by ultraviolet light disinfection. CCWD will provide water service connections (as described in Chapter 8) that will be used as emergency backup if CCWD water is not available. CCWD will provide fire service with the swimming pool and fire booster system providing a secondary source of fire protection.

Big Wave will only recycle wastewater that is required for reuse. In the dry periods and growing seasons, Big Wave will reuse all of its water. In the wet season, Big Wave will discharge about 10,000 gallons per day into the El Granada Sanitary District system.

The project proposes to generate and treat onsite water and recycled wastewater for toilet flushing and agricultural irrigation. The project maintains the options to connect to CCWD for the purchase of domestic water and to Granada Sanitary District for the discharge and treatment of sewage.

Chart 1.10 Water Recycling: Agricultural Well, Recycled Through Buildings (Potable and Toilets)



Notes (Option 1):

1. The project has a net increase in groundwater recharge of 2,300 gal per day due to the design of the infiltration systems.
2. Develops high yield farming
3. Reduces Domestic Water Consumption by 16,000 gallons per day, reducing the municipal impacts of ground water pumping and importing water from the Sierras (negative impacts to streams, rivers and Delta fish)
4. Reduces sewage production and negative ocean impacts.

For well water treatment, we propose to use two 10,000 gallon-per-day AMPAC Reverse Osmosis (RO) systems followed by Trojan Ultraviolet light disinfection, offering complete treatment redundancy. All well water will be recycled with these systems and used throughout the buildings and irrigation. The AMPAC specification sheet is provided in *Appendix 8.5*. The systems described will remove all salt, metals, organic pollutants, and pathogens. Once the water goes through these systems, it will be at distilled water quality, excellent for drinking. The systems cost \$20,000 each. One system will be located at the Wellness Center and one will be located at the Office Park. For redundancy, the systems will be interconnected with a four-inch pipe. The water will be tested daily to comply with State Health Department criteria. The AMPAC system is sized for the average flow of 20 gallons per minute (gpm). A hydropneumatic tank designed to meet the peak demand of up to 150 gpm will be downstream of the RO system. For the desalination option, we propose a 15 gpm salt water intake pump located on the private pier in the Harbor with a 2” feed line (2,000 feet long) and a 2” brine return line. The RO system will be in two stages and will cost an additional \$40,000. The change in the habitat and harbor salinity will not be measurable. It should be noted that the cost of the municipal water connection is \$602,000.

Wastewater (both black and grey) will be treated in a Membrane Reactor Plant (MBR) constructed by Enviroquip. This package plant has been certified by the Regional Water Quality Control Board and the State Health Department to meet the requirements of Title 22 for unrestricted reuse of recycled water. We propose to treat both black and grey water as both waters are treated the same under the Title 22 regulations. It is also easier to biologically treat black water than it is to treat grey water

alone. It should also be noted that the Office Park will not generate much grey water. Treatment of water in the Enviroquip plant will be followed by treatment in the Enaqua Ultraviolet disinfection system. The Enviroquip plant is capable of treating a peaking factor of two. Peaking factors for the plant will be six, so the plant must be designed for 75 gallons per minute. Enviroquip utilizes Kyboto membranes with over 1000 world-wide installations. The system components include screening, biological selection (anoxic zone) with an aeration basin maintaining a mixed liquor of 12,000 ppm and a detention time of about 15 days, aerated membrane filters followed by ultraviolet disinfection. Sludge will either be pressed and hauled to Ox Mountain by Big Wave or discharged into the El Granada Sanitary District Pump Station. The plant will generate approximately ten pounds of dry solids per day (50 lbs. of wet solids, or about 450 gallons of liquid sludge, 12% solids). Big Wave proposes to discharge the 450 gallons of liquid sludge (liquid sludge has the consistency of chocolate milk) into the El Granada Sewage System. A detail of the system proposal is provided in *Appendix 8.2*.

The plant will be sized for double the required capacity, to accommodate redundancy and future demand for recycled water beyond Big Wave (i.e. owners of adjacent farmland may be in the market for recycled water for agricultural usage). Additional recycled water would be managed and distributed by CCWD.

The cost of the 75 gallon per minute plant is approximately \$700,000. The plant would require a NPDES (National Pollution Discharge Elimination System) discharge permit from the State of California RWQCB (Regional Water Quality Control Board). Both the recycling plant and the water plant would require certified operators. Details for the recycling plant are provided in *Appendix 8.2*. Sludge from the plant will be composted (to meet Class A sludge) and spread agriculturally. Recycled water is used for agriculture and for toilet flushing. Purple pipes will be used for all recycled water. It should be noted that the cost for the Municipal Sewage connection is approximately \$730,000.

The benefits of recycled water are as follows:

- It protects wild and scenic rivers and the delta fish population.
- It protects the Half Moon Bay aquifer from overdrafting.
- It protects Pilarcitos Creek.
- It is less costly than conventional water treatment.
- It allows the continuation of farming without aquifer overdraft.
- The drinking water quality is higher and safer.

The proposed desalination system is a membrane filtration system with slow sand filters for pretreatment and ultraviolet light disinfection and is described in the following. Desalination will utilize the existing salt water intake on the Princeton pier. Two, two inch pipes will extend east in the unpaved Ocean Boulevard to Vassar (also unpaved) and North on Vassar to Airport Street. The lines will be installed in the west shoulder of Airport Street and enter the project at Airport Street. The desalination unit will be located in one of the Storage Maintenance rooms on the first floor of the Wellness Center. The pipes will be installed in the unpaved sections of County Roads with an encroachment permit. The intake flow will be 20 gallons per minute and the return flow will be 10 gallons per minute. Intake salt content will be 36,000 ppm and return will 50,000 ppm. This flow is so small that there will be no impacts associated with the intake or discharge. Pre-treatment will be slow sand filters with a loading rate of 0.1 gallons per square foot. To limit Boron in the effluent, the RO flux rate will be 12 gallons/sq. ft per day. Through put water will be 150 ppm salt. Disinfection will be accomplished with ultra violet light. This is the exact system being studied by CDM for the Santa Cruz Desalination system. It is the same size as the system that was recently permitted by the Coastal Commission for the Hotel on Cannery Row in Monterey. Desalination is a proven, approved and permitted technology.

1.11 Operation of Water and Water Recycling Systems

The RO water treatment systems are fully automatic with continuous turbidity readings and alarmed shutdown. Big Wave will operate two completely redundant interconnected systems. To comply with the State Health Department, Big Wave will take water samples from before and after treatment as well as water samples from each building daily. A Big Wave resident will be trained and supervised by a Grade 4 Water Treatment Plant Operator (two hours per day at \$20 per hour). The Grade 4 Operator will inspect the RO System and the UV system on a weekly basis (four hours per week at \$50 per hour). UV bulbs will be changed every 6 months (\$400 in parts and eight hours of labor at \$50 per hour) and membranes will be serviced annually (\$1,000 in parts and eight hours of labor at \$50 per hour). Pumps and automatic valves will be replaced every 5 years (\$5,000 in parts and 16 hours of labor at \$50 per hour).

All water users will have automatic meters that feed into a software program that generates bills. Meter servicing, purchase and replacement are amortized at \$300 per month. A customer service representative will be trained by the Wellness Center to answer questions and solicit help. This person will also be available for parking issues, building maintenance, food orders, and garbage and recycling questions (10% of the customer service representative's time will be allocated to water issue at four hours per week, \$20 per hour). All distribution system components needed for the proposed RO water system would be the same required for the Municipal water system (distribution costs are not included in the evaluation). Power cost will be \$15,000 per year. The total maintenance cost for the water system operation and billing will be approximately \$48,320 per year. It should be noted that the service rate for utility water is \$95,000 per year (approximately double the cost of the proposed system) and is increasing by 11% per year.

The MBR (Membrane Bioreactor) water recycling system will be fully automatic and fully alarmed. All processes of the MBR system (including influent and effluent turbidity) will be continuously monitored. There will be a 24-hour composite automatic sampler. A trained Big Wave resident will check on all systems and processes and collect the sample every day (four hours per day at \$20 per hour). Tests will include influent and effluent BOD (biological oxygen demand) and coliform. This resident will also operate the water system and will be supervised by a Grade 5 Wastewater Treatment Plant Operator. The Grade 5 operator will be the same person who supervises the water treatment (he/she will be dual licensed). After 10 years, we hope that a resident will be a Grade 5 Operator. The Grade 5 Operator will adjust the mixed liquor concentration and waste sludge to compost every week and fill out the monthly report of compiled test reports (four hours per week at \$50 per week). On a weekly basis, the Grade 5 Operator will inspect the membranes, pumps, sludge levels and turbidity meters as well as the UV system (four hours per week at \$50 per hour). UV bulbs will be changed every three months (\$400 parts and eight hours in labor at \$50 per hour) and membranes will be cleaned annually (8 hours at \$50 per hour) and replaced every 15 years (\$15,000). Pumps and automatic valves will be replaced every 5 years (\$5000 in parts and 16 hours in labor at \$50 per hour).

All recycling water users will have automatic billing generated from the same software program that bills for water. The same customer service representative provided by the Wellness Center for the water will be trained to respond to questions and solicit help for the recycled water. Ten percent of the customer service representative's time will be allocated to water recycling issues (four hours per week at \$20 per hour). Power cost will be \$25,000 per year. The total maintenance cost for the water system operation and billing will be approximately \$48,320 per year. It should be noted that the service rate for utility water is \$95,000 per year (approximately double the cost of the proposed system). The total annual cost to operate the water recycling plant will be \$80,760. It should also be noted that the cost for Municipal sewer service charges are \$48,500 per year and increasing by about 12% each year.

The cost to run both the Water System and the Water Recycling system will be \$130,000 per year versus the cost of purchasing Municipal water and sewage at a cost of \$145,000 per year. The cost of service by the DD (developmentally disabled) community will increase by about 2% per year, while the cost of municipal treatment will increase by over 10% per year. With the proposed Water System and Water Recycling System, water quality will be excellent (distilled water quality), service and reliability

will be first-rate, and four DD residents will have great professional jobs. Recycling water will reduce the water bill to the Office Park by about \$95,000 per year. The savings exceed the cost of operation by \$10,000 per year.

1.12 Ground Water Infiltration System

The ground water infiltration system is designed to infiltrate approximately 12,000 gallons of water per day—or 80% of the first flush and about 80% of the total rainfall. This insures adequate ground water recharge and compliance with the San Mateo County Water Pollution Prevention Program (SMCWPPP) provision C.3.c.i.3. Key features of the ground water infiltration system are the permeable concrete parking lots and walkways and the rainwater gardens (as illustrated in the Wetlands Restoration Design in *Appendix 4.4*). The rainwater gardens allow for the infiltration of 50% of the roof runoff. The permeable parking lot will infiltrate 80% of the annual rainfall.

The concrete can pass about three inches of rain per hour. The concrete is supported by crushed rock, also with a porosity of three inches per hour. The volume storage of the concrete and the rock holds excess water during intense rain and allows the water to uniformly spread over the surface soil. The surface soil will be prepared to infiltrate ½ to 1 inch of water per hour. This preparation requires that all of the impermeable soils be removed from the infiltration area and deposited in the restored wetlands area. Permeable soils will be relocated from the restored wetlands area and placed in the infiltration area. Approximately 200,000 cubic yards of soil will be graded. The surface soils will be rich in bacteria and provide biological treatment for pollutants and bacteria. A catalog cut sheet is provided in *Appendix 8.3*.

1.13 Traffic Improvements

Under the Project Traffic Impacts and Mitigation Measure section of the traffic report it is stated that, “the analysis showed that Alternative 1 [the Wellness Center and 156,000 square feet of office space] would not cause any significant impacts either alone or cumulatively on traffic conditions at the signalized and un-signalized study intersections.” Alternative 2 (the Wellness Center and 225,000 cubic feet of office space) would cause a traffic impact at the intersection of Cypress and Highway 1 in the evening and would require a signal to reduce the impacts to less than significant. The Proposed Project illustrated in *Table 7.1.3* has lower daily, AM Peak and PM Peak trip generation and will not cause any significant impacts either alone or cumulatively on traffic conditions at the signalized and un-signalized study intersections.

1.14 Parking, Fencing and Habitat Protection Barriers

As discussed in section 1.11 (Operation of Water and Water Recycling Systems), all walkways and parking lots have been designed as infiltration systems. As illustrated in *Figure 1.1.1*, excess runoff (exceeding 80% of first flush) will be collected in oil and grit removal catch basins and directed to depressions in the wetlands for biological treatment.

The Wellness Center has 73 parking spaces for staff and visitors. The majority of the staff will live at the Wellness Center.

The total number of parking spaces for the Office Park is 640 in the main lot. The County parking ordinance requires one space for every 200 square feet of office space. The County ordinance does not specify parking requirements for lower density uses. It is assumed that that parking requirements are directly related to trip generation for office parks. In accordance with the existing ordinance of one space for every 200 square feet, 776 parking spaces would be required. Only 621 spaces would be required if the County would grant an exception to allow one parking space for every 250 square feet. Most cities in San Mateo County with public transportation allow one space for every 250 square feet of office space.

As some of the residents cannot be allowed to wander off, the Wellness Center requires some security fencing. Also, developmentally disabled individuals are routine victims of financial fraud and assault. Minimal fencing will be required. A gate between the Recreation Center and the southeast property line will be requisite. A security fence will be installed between the north breezeway homes and the north property lines. Gates will be provided at both the north and south with card locks for fire access. All access for residents, employees and guests will be through the building lobby. Access to the wetlands will be through the Recreation Center. There will be a willow waddle fence planted around the property line to restrict public access.

1.15 Outside Lighting

All developed pathways will be illuminated with three foot tall lighting bollards that direct the lighting downward. Each bollard shall have a maximum power consumption of 100 watts and a maximum coverage of a 30 foot circle. The bollards will be spaced at 20 foot intervals along all paved walkways and parking islands.

Draft #2

2.0 Goals and Objectives

2.1. Privately Funded Wellness Center

A project goal is to privately fund the Big Wave Wellness Center so that the residents can control their own living environment. Private funding will allow the residents to own their own homes and avoid being subject to the ever-changing requirements and regulations placed on publicly funded homes. In allowing a Board of Directors to select residents based on their ability to fit within the specific nature of the Big Wave community, Big Wave can be more flexible and adaptable than public housing. Big Wave intends to select individuals regardless of their economic and racial backgrounds but reserves the right to discriminate based on the type of services available as well as the personalities and abilities of the applicants. Individuals living in the Big Wave Community will have a wide range of disabilities, but will share the common desire and ability to live in the community.

Although residents living at the Wellness Center may receive public funding individually, it is a project goal that the land, design, construction and future funding for the Wellness Center operations be privately funded by the developer, by other private party donations, and through revenue generated in the adjacent Office Park. A clear objective of Big Wave is to create a dynamic financial engine in the adjacent Office Park to perpetually fuel the Wellness Center. In addition to providing recurring funding for the Wellness Center, the adjacent Office Park will provide meaningful and reliable full-time and part-time employment to developmentally disabled (DD) adults.

It is a goal that the private funding will come from—but will not be limited to—the following areas:

- The developers of the Office Park will donate costs for permit acquisition and donate 5.25 acres for the Wellness Center.
- The developers have donated and will continue to donate funds for design, engineering, environmental impact reports, permitting and infrastructure costs for the development of the Wellness Center.
- On-site commercial rentals and Office Park rentals will generate recurring, inflation-adjusted revenue.
- Alternative energy and communication systems will generate revenue and jobs for the benefit of the Wellness Center and the Wellness Center residents.
- Office Park rental space (based on a square foot assessment) will generate revenue.
- Goods and services produced by Wellness Center businesses will be sold to the 600–700 workers in the adjacent Office Park.

2.2 Provide Affordable Housing.

The following are project goals for providing affordable housing for the Developmentally Disabled (DD) and their caregivers:

- Provide affordable housing to allow the DD (who typically make 15% of the per capita income) to purchase their own homes in one of the most expensive areas in California. This goal will be accomplished through already secured donations, by utilizing future commercial revenue, and by implementing innovative, modular construction techniques to cut construction costs by over 40%.
- Offer below market rate housing to the caregivers of the DD to attract and to retain better caregivers.
- Utilize below market first-time buyer interest rates (if available).
- Lower per unit square footage needed by building a community center that all residents will share.

2.3 Enriched Quality of Life for Developmentally Disabled Residents

It is a goal to provide affordable housing to the developmentally disabled residents. It is also a goal to provide affordable access to other areas of life that provide purpose, security, a sense of community and well being. These goals will be achieved by way of the following:

- Safe and secure home for DD adults;
- Healthy, organic, diet-sensitive prepared meals served in a communal dining room;
- Recreational and artistic opportunities in a great room and in other parts of the Wellness Center;
- Library and learning rooms for continuing education;
- Open space, gardens, pool, basketball courts, and wetland and environmental education onsite;
- Office space with reduced rent in the Wellness Center to encourage business start-ups by professionals who provide health and educational services to the DD;
- Supervised maintenance programs that encourage residents' pride of ownership and sense of community while also cutting costs of hiring outside help to maintain grounds and structures;
- Access within walking or wheelchair distance to jobs both on the Wellness Center site and in the adjacent Office Park;
- Accessible, on-site staff and caregivers for assistance in daily activities as well as to serve as mentors to the DD residents;
- Robust commercial enterprises both onsite at the Wellness Center and in the adjacent Office Park, providing ever increasing, recurring, inflation adjusted revenue for the Wellness Center with surplus revenue being used to reduce the living expenses of the residents.

A goal is to have the commercial ventures pay for nearly 100% of the cost of living for the residents, as well as providing additional services for the DD residents.

2.4 Strong Sense of Community

A large number of Coastside residents are developmentally disabled. A sense of community is critical to the DD population, as they often cannot drive. As a result, DD adults are isolated from many services and jobs that only exist “over the hill” (in urban areas of San Mateo County) and in San Francisco. The Coastside lacks the services essential to provide a thriving community for its DD residents. The parents and caregivers of the Coastside’s developmentally disabled (over 200 individuals) have few options to access care. They can spend hours driving over the hill and into urban areas to access services; send their adult children away from their homes and community to live in an unfamiliar urban setting; or fail to seek out services, leaving their developmentally disabled children to become more and more isolated as adults and ultimately, potential wardens of the State.

A Big Wave goal is to incorporate the Wellness Center residences with a centralized business community. Through this integration, Big Wave will provide its DD residents with onsite jobs that will promote interaction with the greater community. Big Wave hopes to maintain a constant, symbiotic interaction between the Office Park and the Wellness Center. Each will support the other. A project goal is to provide lower-skilled, supportive Office Park jobs to DD Wellness Center residents. The employed Wellness Center residents will offer a variety of goods and services to the employees and businesses in the Office Park. Out of the Coastside community’s need for local, “clean” jobs and the developmentally-disabled community’s need for better opportunities and services, a stronger, more inclusive community will develop.

Here are other goals that create a strong community in Big Wave:

- A diverse group of people will constantly interact in daily activities: growing and selling food, participating in educational and recreational opportunities, working, volunteering, starting and growing businesses, caring for the natural environment.
- Both the residents of Big Wave Wellness Center and the businesses in Big Wave Office Park will have the opportunity to own their spaces instead of simply renting.
- The construction and the services to be offered in the Wellness Center are designed to encourage interaction between residents. Residents, for example, will take shared meals (prepared with the help of residents) in a communal setting to encourage social interaction.
- The Community Center within the Wellness Center will serve as the heart of the community, providing not only meals but educational, work and recreational opportunities, and a place to receive mentorship. All Big Wave administrative offices will be located in the Community Center.
- Big Wave will emphasize shared self sufficiency, alternative energy creation, creating and selling goods, the growing of food, and maintaining shared grounds and personal space.

2.5 Jobs and Careers

A goal is to develop over 700 long-term local, “clean,” high-paying jobs in the Office Park and the Wellness Center. This estimate does not include those jobs created during the construction of the project or jobs that later will arise to support this dynamic community.

One of the most important goals is the generation of over 80 full and part time jobs for the developmentally disabled (DD). Big Wave will create these jobs specifically for developmentally disabled individuals. The goal is to have these jobs filled by both residents of Big Wave and by developmentally disabled candidates from the surrounding Coastside community. A related Big Wave goal is to have the

financial resources to budget for a full-time staff to develop jobs for the DD, both in placing the DD in existing businesses at Big Wave and in the actual creation of businesses to be staffed with the DD. A goal is to provide the following job opportunities:

- Kitchen and dining staff
- Big Wave Store
- Maintenance, Wellness Center and Office Park
- Big Wave administrative
- Big Wave Farming
- Big Wave wetlands restoration and native plant nursery
- Deli, Bakery, food prep for employees at Office Park
- Egg and food delivery to Office Park
- Lower skilled office jobs on site commercial
- Lower skilled office jobs in Office Park
- Entrepreneurial opportunities
- Health Center
- Creation and maintenance of alternative energy systems
- Creation and maintenance of alternative communication systems
- Maintaining water and sewage recycling systems
- Dog walking and grooming

In total, Big Wave will generate over 700 skilled office jobs on the Coastside and over 80 jobs for DD individuals.

2.6 Financial Sustainability

One of the major keys to the long-term viability of Big Wave Wellness Center is its financial sustainability.

- Will funds be there to care for the residents as time and inflation grind on?
- What steps is Big Wave taking to insure that in 30 years, after the project founders and the residents' caregivers may have gone, there will be sufficient recurring revenue to maintain the level of service that the residents will need?

A goal will be to develop the Big Wave Office Park in a manner that it provides a long term source of income and a market for the jobs and materials that the Wellness Center has to offer.

- Demonstrate financial sustainability of the Office Park.
- Develop the Office Park so that it generates between \$500,000 and \$1,000,000 per year for the operation of the Wellness Center.

2.7 Cultural Longevity

In order to remain a strong force to better the lives of the Developmentally Disabled, it is a goal for the Founders, Advisory Board and Corporate Board to consistently ensure that anybody involved in Big Wave will both adhere to the Mission of Big Wave and aspire to excellence in all areas.

Big Wave's cultural goals will be to:

- Establish a Board of Directors with a strong, consistent corporate culture.
- Ensure that all employees, from the CEO to the dishwasher, understand the goals of Big Wave and teach the proper culture by example.
- Ensure that the Boards of Big Wave truly believe that excellence in effort should be properly recognized.
- Use the revenue from its successful business enterprises to pay all employees above the scale normally paid for equivalent work in similar industries. This practice will allow Big

Wave to hire a higher caliber of employee and to retain that employee for a longer period. This will ensure additional stability for the lives of the Big Wave residents.

2.8 Ownership

It is a Big Wave goal to provide both the developmentally disabled and the business owners in the Office Park the option of owning their own places. Ownership provides financial security, contentment, self esteem, and a place of sanctuary. Communities are much more cohesive and vibrant if the community members own their own homes and businesses.

Affordable housing in the Big Wave lexicon means that a developmentally disabled person—who makes on average 15% of the per capita in San Mateo County—will have the economic capability of owning his or her own home in a secure, enriching, healthy community. In addition to home ownership, it is a goal for the DD residents to own shares in the Co-op. In a co-op, each shareholder will directly benefit from the wealth generated by the community's commercial ventures. Although each shareholder (resident) may not receive direct monetary gain from surplus revenue, they will receive benefits in either reduced costs for services and living expenses or for additional services that Big Wave will offer as a result of having more revenue to spend.

Big Wave, LLC has the following goals for the Office Park:

- Divide the Office Park into units that can be sold as office condominiums.
- Offer spaces as small as 2,000 SF up to whole buildings.
- Allow local businesses several options in relocating its business to Big Wave. Big Wave believes the more local ownership we have of the Office Park, the stronger its connection will be not only to the Big Wave Wellness Community, but to the Coastside community as a whole.

Big Wave has the following ownership goals:

- Allow a very low income individual with an average income of 15% of the norm to own a home on the Coastside.
- Allow very low income individuals to own co-op shares in the business and receive financial benefits in services or in income.
- Allow business owners to own their office space.

2.9 Environmental Sustainability

A key project goal is to design an environmentally sustainable community that not only protects the environment, but restores portions of the habitat to its undisturbed state. The following are specific environmental goals of the Big Wave Project:

- Establish a minimum of 100 feet of restored buffer —as required by the approved Local Coastal Plan (LCP) — from the boundary of delineated State Wetlands.
- Provide a significant wetlands restoration project component based on regional models with design by qualified geomorphologist and coastal wetlands biologist approved by the Fish and Game authority.
- Provide enhanced functioning habitat for threatened and endangered species.
- Provide enhanced bird habitat.
- Provide high density development to maximize the open space for wetlands restoration.
- Integrate the restoration into the development area— to increase the restoration area while providing protection to the habitat from the development.
- Design all grading and development to avoid construction in Waters of the United States.
- Ensure all facilities will be located above the 100-year flood elevation.

- Provide the standard Corps of Engineers freeboard of three feet above the 100 year flood level (Elevation 8.5).
- Design the project so that the 200 year tsunami event does not impact the project.
- Design the project so that the impacts of 100 year global warming do not impact the project.
- To protect the safe yield of the Pillar Point Marsh aquifer, groundwater utilized domestically and for irrigation will not exceed the designed infiltration amount for project infiltration systems.
- Implement parking procedures that result in 35% of the office workers utilizing ride sharing, shuttle service to park and ride lots, and public transportation.
- Ensure that there is no ground water pollution.
- Ensure that there is no soil pollution and that clean up occurs following any incidents, if necessary.
- Prepare a SMCWPPP that incorporates design measures that will include: protection of sensitive biological areas with minimal changes to the natural topography; minimization of impervious surface; minimization of impervious areas connected to the storm drains; maximize permeability by preserving open space; use permeable pavement for parking and walkways; use landscaping to treat storm water; use native plants for all landscaping.
- Improve traffic congestion on Highway 1 and Highway 92.
- Reduce air pollution by reducing traffic along Highway 1 and Highway 92.
- Reduce air pollution, focus the design on techniques and materials that reduce air and water pollution as described in the US Design and Building Council LEED (Leadership in Environmental and Energy Design).
- Reduce air pollution by maximizing CO2 uptake with landscaping.
- Reduce air pollution by maximizing onsite energy management and energy production.
- Reduce air pollution by emphasizing alternative transportation.
- Obtain Platinum LEED certification.
- Increased farm potential by 25 acres of leased land (zoned industrial) in the airport for permanent high yield farming with recycled water.
- Construct bicycle storage and changing facilities.
- Provide priority parking for low-emitting, fuel-efficient vehicles (5% of total spaces).
- Parking will not be sized to exceed local parking ordinances. Ideally, parking will be more efficient than the current parking ordinances.
- The project maximizes open space with 47% of the entire site planned for restoration as wetlands. The developed coverage is far less than required by the County Planning Department.
- The storm water design significantly reduces existing impermeable surface and the proposed project has less than 25% permeable surfaces.
- The storm water design maximizes infiltration and native plant evapotranspiration.
- Use permeable concrete pavement with high reflectivity and porous, open-grid design.
- Minimize lighting pollution.
- The project will include tenant guidelines designed for energy efficiency and environmental protection.

- Irrigate landscapes and flush toilets with recycled water.
- All landscaping is with native plants that do not require water or maintenance once mature.
- Ground water recharge systems will exceed the usage amount.
- Use geothermal cooling without refrigerants.
- Power will be produced by solar and/or wind.
- Over 50% of the construction waste will be recycled with a goal of 75%.
- Smoking in the buildings will be limited on site.
- Big Wave plans to recycle at least 50% of all operational materials with a goal of 75%.
- The project will employ LEED accredited professionals focusing on a certified innovative design process.

2.10 Consistent with Local Planning Goals

The Big Wave Project Team has developed a project that is consistent with the County of San Mateo's General Plan and Zoning Regulations. In this geographic area, the General Plan is the County's Local Coastal Program. There are two zoning designations on the site. The commercial site is primarily zoned M1/DR, in other words, light industrial with design review. The Wellness Center is on a site which is W/DR, Waterfront/Design Review. The commercial site is wholly consistent with the M1 light industrial zone. This zone imposes no specific density regulations on the size of the commercial site.

The Big Wave Project Team has developed a commercial project that meets the requirements of the Local Coastal Program to develop a job-oriented site. Too often, projects on the Coastsides contribute to the imbalance between jobs and housing. In other words, more housing is created, but no opportunities are created for high-quality employment. In this case, the Big Wave Project Team has developed a commercial site that will service Coastsides residents with close-in, first-class office space, while alleviating traffic congestion for Coastsides residents who, otherwise, would have to commute to urban San Mateo County or into San Francisco. The project is consistent with the Local Coastal Program's general plan designation and the underlying zoning.

In the case of the Wellness Center, the site is consistent with Waterfront/Design Review. The Development Team long ago discussed an application for a use permit with the County of San Mateo Planning Department for the site. The use permit process is the traditional zoning process employed when a use such as a Wellness Center is considered for any particular site within the County. Through the use permit process, the unique Wellness Center will receive thorough review by the County Planning staff. Finally, both sites have been planned recognizing restrictions from the airport overlay zone (since the site is west of the existing Half Moon Bay Airport). The Big Wave development team has met for many months with the County Planning Staff and the County Council's office to ensure that this project—as it is presently designed—meets existing requirements and does not require any amendment to the existing regulations.

The project is consistent with all County, State and Federal Regulations for habitat and endangered species protection. The project will comply with all requirements of the State Regional Water

Quality Control Board and State Health Department. The project will comply with the San Mateo County Storm Water Pollution Prevention Program. The project is consistent with the Midcoast Local Coastal Plan update. The project will be certified by LEED at the Gold or Platinum level. The project requires no variances from Local, State, or Federal laws or enacted plans. The project will be designed with the 2007 California Building Code. The County of San Mateo's Proposed Mid Coast Local Coastal Plan is attached in *Appendix 2.10*.

The specific project planning goals are as follows:

- Consistent with the County's General Plan and Zoning Regulations.
- Meets the requirements of the Local Coastal Program to develop a job oriented site.
- Consistent with all County, State and Federal Regulations for habitat and endangered species protection.
- Consistent with the County Local Coastal Plan for the Mid Coast.
- The project requires no variances from Local, State or Federal laws or enacted plans.

3.0 Economic Analyses

3.1 Office Park

Big Wave, LLC contracted with Enright & Company, a real estate appraisal office, to determine if:

- There is a strong market demand from businesses for a class A Office Park on the Coastsides
- Coastsides residents would be likely to secure employment at the companies that would establish businesses at the Big Wave Office Park. A copy of the report is provided in *Appendix 3.2*. The report, completed July 20, 2007, provided an affirmative to both areas as described in the following excerpts from the Enright & Company report:
 - "The previously identified statistics suggest that demand may be solid for the projects, although a gradual phasing of the project is suggested."
 - "Interviews with local area businesses indicated that most employees [on the Coastsides] would prefer to work closer to their residences, but do not have those options based on limited Coastsides opportunity."
 - "The proposed pricing of the [Big Wave] office condominiums also suggests that demand may be strong."
 - "Property owners and current business tenants [on the Coastsides] lament the lack of good quality product, particularly within a business park setting, and buyer interest for small properties [such as office condominiums] remains generally solid."
 - "Overall, based on an extensive survey of the needs of local businesses, coupled with current employment demographics and industry trends in general, the proposed subject property is concluded to likely be met with adequate demand."
 - "The results of the survey data, coupled with numerous conversations with business owners, tenants, and city officials, indicate that local area residents of the San Mateo County Coastsides would likely be able to secure employment at companies that could be established at the proposed Big Wave development. The characteristics of the subject citing, coupled with the mentality of local residents (desiring minimal driving times, loyalty to the coastal communities, desire for business park settings in minimally trafficked areas, and the like), suggests that coastal residents will be attracted to employment opportunities likely to be

offered at the anticipated project, and furthermore will likely possess the necessary skills required by those employees.”

3.2 Wellness Center

Recurring, inflation-adjusted revenue in perpetuity from the Office Park is the key to the financial sustainability of the Wellness Center. Additionally, the opportunity for Big Wave residents’ employment in the Office Park is a unique part of the design for Big Wave. Big Wave Office Park, if built as designed, will provide \$675,000 in today’s dollars of recurring, inflation-adjusted annual revenue to the Wellness Center. In addition to providing direct revenue, 50 of the 80 jobs that Big Wave creates for the developmentally disabled (DD) will either be directly in the Office Park or will be generated through sales to the employees working in the Office Park. These jobs will generate over \$1,000,000 in income that will go directly to the developmentally disabled employees.

If built as planned, the commercial property in the Wellness Center site itself will generate over one million dollars in recurring, inflation-adjusted annual revenue. Mortgages of nearly \$5 million for the Community Center and for the commercial space in the Wellness Center will be offset by this income.

The key to understanding Big Wave’s financial sustainability is to recognize the beauty that a recurring, inflation-adjusted revenue stream provides. As Big Wave’s recurring revenue increases, and mortgages on property stay stable, the stronger Big Wave becomes financially. After the 30th year, once all mortgages have been retired, Big Wave’s inflation adjusted recurring revenue stream (based on 3% COLA) will generate over \$4.6 million in annual revenue or \$115,000 per resident.

Big Wave, albeit a non-profit corporation, will always be run with strong fiscal principles. The financial goal of Big Wave is to eventually have revenue cover 100% of resident costs and provide enough annual revenue to continually upgrade services for its residents and the DD community at large.

Table 3.2 illustrates the financial potential of Big Wave through three scenarios: Model 1 demonstrates the financial sustainability if none of the commercial facilities are built (no financial sustainability exists); Model 2 shows the surplus revenue before all mortgages are paid off; and Model 3 outlines the surplus revenue once all mortgages are paid in full.

- **Model 1** shows annual revenue of \$656,000 which primarily comes from resident fees and some revenue from the Wellness Center’s Community Center usage fees and staff rentals. There is no commercial revenue generation as no commercial buildings exist. Model 1 creates an annual deficit of \$656,000. Without the support of the Office Park, unless all residents were able to cover the budget revenue shortfall, the Wellness Center would be unable to function financially.
- **Model 2** illustrates all revenue and costs based on the construction of the commercial development. In this case, even after paying all mortgage costs, the Wellness Center has an annual budget surplus of \$288,600, or \$7,215 per developmentally disabled resident.
- **Model 3** illustrates the budget surplus if all mortgages were paid off in the first year of operation through private donations. The surplus would be \$851,000 annually, or \$21,275 per DD resident. Note that the mortgages may take anywhere from 1 to 30 years to retire and Model 3 is used to show the potential of this financially sustainable project. It should also be understood that the revenue producing assets herein are recurring, inflation-adjusted assets that will grow in time, while much of the costs (e.g. mortgages) will remain fixed.

Table 3.2 (see next page) also illustrates the anticipated per resident costs with and without subsidized construction and commercial revenue.

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Table 3.2

| Financial Projections with and without Office Park and onsite commercial | | | | | | | | | |
|---|-----------|---------|-----------|--------------------|-------|------------|--------------------|------------|--------------------|
| Model 1: Wellness Center without subsidies from Office Park or commercial lease income from onsite | | | | | | | | | |
| Model 2: Wellness Center Commercial rented as offices, 225 k SF Office Park | | | | | | | | | |
| Model 3: Com Ctr, Wel Commercial, res rentals without mortgage, with Mod 2 revenue | | | | | | | | | |
| Revenue | | | | Model 1 | | | Model 2 | | Model 3 |
| Commercial lease income (Wellness Center site) | | | | | | | \$881,600 | | \$881,600 |
| Office Park SF assessment, @ \$.05 | | | | | | | \$135,000 | | \$135,000 |
| Deli Rental office park | | | | | | | \$24,000 | | \$24,000 |
| Energy sales, Office park, net after costs | | | | | | | \$156,000 | | \$156,000 |
| Market rate residential, 8 units | | | | \$120,000 | | | \$120,000 | | \$120,000 |
| Property mgn office park, net after costs | | | | | | | \$24,000 | | \$24,000 |
| Water sales (well) to office park | | | | | | | \$12,000 | | \$12,000 |
| Rent and Fees, community Center | | | | \$48,000 | | | \$48,000 | | \$48,000 |
| Communicat sales, Microwave wi-fi, net | | | | | | | \$36,000 | | \$36,000 |
| User Fees from residents, 40 each | | | | \$144,000 | | | \$144,000 | | \$144,000 |
| Rentals to staff, 10 units | | | | \$80,000 | | | \$80,000 | | \$80,000 |
| Food tickets, \$550 per month, 40 each | | | | \$264,000 | | | \$264,000 | | \$264,000 |
| Total Revenue | | | | \$656,000 | | | \$1,924,600 | | \$1,924,600 |
| excludes \$.22 SF association fees collected and put into a reserve account for maintenance, \$105,600 | | | | | | | | | |
| Expenses (all payroll costs includes burden and fringe benefits) | | | | | | | | | |
| Total payroll, admin, excludes payroll for caregivers | | | | \$730,000 | | | \$730,000 | | \$730,000 |
| Food Prep, 29,760 meals | | | | \$120,000 | | | \$120,000 | | \$120,000 |
| Food | | | | \$144,000 | | | \$144,000 | | \$144,000 |
| Carrying costs, comm ctr, \$1.8 million | | | | \$156,000 | | | \$156,000 | | \$20,000 |
| Carrying cost commercial \$3 million | | | | | | | \$324,000 | | \$20,000 |
| Carrying costs 18 units staff/market rents | | | | \$138,000 | | | \$138,000 | | \$15,000 |
| supplies | | | | \$24,000 | | | \$24,000 | | \$24,000 |
| Total costs | | | | \$1,312,000 | | | \$1,636,000 | | \$1,073,000 |
| Surplus Revenue | | | | (\$656,000) | | | \$288,600 | | \$851,600 |
| Resident Purchase Price/ Monthly Costs with subsidized construction | | | | | | | adjust cost | adjust cst | adjst cst |
| SF Unit | Price | Mo cost | user fees | Asoc fee | meals | Total cost | Cash flow 1 | CF 2 | CF 3 |
| 1,200 | \$240,000 | \$1,100 | \$300 | \$264 | \$550 | \$2,214 | \$3,717 | \$1,554 | \$259 |
| 600 | \$120,000 | \$550 | \$300 | \$132 | \$550 | \$1,532 | \$2,625 | \$1,052 | \$111 |
| 400 | \$80,000 | \$370 | \$300 | \$88 | \$550 | \$1,308 | \$2,264 | \$888 | \$65 |
| User Fee = \$300 to cover carrying costs of community ctr. Association fee: \$.22 PSF kept in reserve acct | | | | | | | | | |
| Resident Purchase Price/Monthly Cost without subsidized construction | | | | | | | adjust cost | Adjust cst | Adjust cst |
| SF Unit | Price | Mo Cost | user fees | Asoc fee | meals | Total cost | Cash flow 1 | CF 2 | CF 3 |
| 1,200 | \$420,000 | \$1,925 | \$300 | \$264 | \$550 | 3,039 | \$4,542 | \$2,379 | \$1,084 |
| 600 | \$210,000 | \$963 | \$300 | \$132 | \$550 | 1,945 | \$3,038 | \$1,465 | \$524 |
| 400 | \$140,000 | \$648 | \$300 | \$88 | \$550 | \$1,586 | \$2,542 | \$1,166 | \$343 |
| Notes and Assumptions | | | | | | | | | |
| Subsidized construction consists of land, design/engineering, infrastructure donation from Office Park developer | | | | | | | | | |
| 40 DD residents plus housing for staff and market rentals | | | | | | | | | |
| 40,000 SF of residential space | | | | | | | | | |
| 24,000 SF commercial space on Wellness Center site | | | | | | | | | |
| 15,000 SF community center | | | | | | | | | |
| Resident monthly mortgage costs based on 10% down, a 3.5% special interest rate, insurance/prop tx | | | | | | | | | |
| Carrying costs for Community Center, commercial and market rate rentals based on market rates | | | | | | | | | |
| \$.22 psf association fees include maintenance and replacement costs for int./ext. residential units | | | | | | | | | |
| User fee, \$300 per month per residents, is solely for the carrying costs of the Community Center | | | | | | | | | |
| Carrying costs for DD residential space included from 2009's Budgets to cover these costs | | | | | | | | | |
| Food per month includes his amount as well as the affordability range of most developmentally disabled adults. If | | | | | | | | | |
| All earnings neutral income from operations that generate jobs but no profit is excluded | | | | | | | | | |
| Allocation of cash flow for the benefit of the DD residents (shareholders) is calculated as follows: | | | | | | | | | |
| 1. One half of the cash flow is allocated to reduction based on square feet of property owned | | | | | | | | | |
| 2. One half of cash flow is allocated based on number of residents, each of whom equally share returns | | | | | | | | | |

Table 3.3 analyzes the cost to build the Wellness Center and the Office Park, the amount of money the Wellness Center will need to be financially feasible, and the amount of commercial space required for the developers to both subsidize the Wellness Center and to make a reasonable return on their risk and investment.

Table 3.3: Economic Analyses

| Economic Analyses (Office Park) | | | | 1 | 2 | 3 | 4 |
|---|--|--|--|---------------------|-----------------------|----------------------|---------------------|
| TABLE 3.3 | | | | Wellness | 75,000 SF | 150,000 SF | 225,000 SF |
| Item | | | | Center | Office Park | Office Park | Office Park |
| Land, interest, insurance, carrying costs, 11 years | | | | \$1,900,000 | \$2,300,000 | \$2,300,000 | \$2,300,000 |
| Environmental Impact Report & associated costs | | | | \$100,000 | \$300,000 | \$300,000 | \$300,000 |
| Preliminary Design and Engineering | | | | \$175,000 | \$150,000 | \$150,000 | \$150,000 |
| Wetland Restoration, biology, preliminary Design | | | | \$40,000 | \$80,000 | \$80,000 | \$80,000 |
| Design and Engineering | | | | \$225,000 | \$250,000 | \$290,000 | \$350,000 |
| Supplies and services | | | | \$40,000 | \$40,000 | \$55,000 | \$80,000 |
| City, County, School, Utility fees and bonds | | | | \$400,000 | \$800,000 | \$1,050,000 | \$1,400,000 |
| Other Fees | | | | \$120,000 | \$250,000 | \$250,000 | \$250,000 |
| Legal and expert witnesses | | | | \$75,000 | \$150,000 | \$150,000 | \$150,000 |
| Sitework | | | | \$2,400,000 | \$3,900,000 | \$4,400,000 | \$4,400,000 |
| Offsite Improvements | | | | \$175,000 | \$525,000 | \$525,000 | \$525,000 |
| Wetland Restoration | | | | \$200,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 |
| Walking and Wheel Chair Paths | | | | \$100,000 | \$300,000 | \$300,000 | \$300,000 |
| Road Improvements | | | | \$300,000 | \$700,000 | \$700,000 | \$700,000 |
| Total | | | | \$6,250,000 | \$10,745,000 | \$11,550,000 | \$11,985,000 |
| Total Developer costs, Wellness + Office Park | | | | N/A | \$16,995,000 | \$17,800,000 | \$18,235,000 |
| Bldg costs, include carrying costs thru construction * | | | | \$13,000,000 | \$16,500,000 | \$33,000,000 | \$49,500,000 |
| Real estate fees on sale (6%) | | | | | \$990,000 | \$3,150,000 | \$4,725,000 |
| Total Cost | | | | \$19,250,000 | \$34,485,000 | \$53,950,000 | \$72,460,000 |
| * Based on \$220 PSF for offices | | | | | | | |
| Sale Price of Offices (based on \$350 PSF) | | | | | \$16,500,000 | \$52,500,000 | \$78,750,000 |
| Return on Investment (Total sale price less costs including Wellness Ctr. costs paid by Developer) | | | | | (\$17,985,000) | (\$1,450,000) | \$6,290,000 |

The initial budget for land, design engineering and infrastructure for the Wellness Center is \$6,250,000. The costs for the same elements for the Office Park range from \$10,745,000 (for 75,000 sq. ft.) to \$11,985,000 (for 225,000 sq. ft.).

The developers intend to donate the \$6,250,000 the Wellness Center needs if they can realize a reasonable return on investment on the sale or lease of the Office Park. Columns 2 through 4 show the total costs to the developer before the construction begins. This includes donating the \$6,250,000 needed for the Wellness Center. To develop the project, they would need \$16,995,000 for a 75,000 sq. ft. Office Park, \$17,800,000 for 150,000 sq. ft., and \$18,235,000 for 225,000 sq. ft.

The last entry on Table 3.3, entitled “Return on Investment,” shows the anticipated return on investment after all costs, including the \$6,250,000 donation to the Wellness Center. A 75,000 square foot Office Park would generate a loss of nearly \$18,000,000. A 150,000 square foot Office Park would generate a loss of \$1,450,000. The 225,000 square foot Office Park would generate a positive return of \$6,290,000.

The most sustainable way to construct the Office Park is to design it for 225,000 sq. ft. This design will be a benefit to the Coastside community at large and will be of deep benefit to the developmentally disabled population.

4.0 Biological Resources

The project is comprised of two parcels of land (the 5.4 acre Wellness Center site and the 14.3 acre Office Park site) adjacent to the east and separated by the Pillar Point Marsh. These parcels were formed during the acquisition of the Pillar Point Marsh by the County during the mid 1990s. The parcels (along with the marsh) have been farmed since the early 1900s. Farming in the County-owned marsh area ceased during the 1980s and 1990s. Farming on the two Big Wave parcels has continued to the present.

The current source of Pillar Point Marsh is the small watershed associated with the east flank of the Pillar Point Headlands and the depression associated with the San Gregorio Fault. The San Gregorio Fault is the driving force in the formation of valley between Denniston Creek and the Pillar Point Headlands.

Prior to the filling for the airport, drainage from Airport Street appears to have trended east across the Denniston Creek alluvial fan to Denniston Creek. Placing the fill for the airport (up to 10 meters) in 1940 diverted the drainage from the airport, a portion of Highway 1 and a portion of what may have been a part of the drainage shed from San Vicente Creek to the Pillar Point Marsh.

Prior to the development of the Airport and agricultural development in the early 1900's, Denniston Creek was most likely the primary source of fresh water to the Pillar Point Creek. Prior to 1980, the El Granada Sanitary District discharge treated sewage in the Marsh. This sewage discharge maintained the fresh system following the diversion of Denniston Creek. In 1980, the El Granada Pump Station was decommissioned, the Pillar Ridge Pump Station (Montara Sanitary District) and the Princeton Pump Station (El Granada Sanitary District) and diverted the majority of the remaining fresh water flow into the marsh. The current Fresh Water Source is surfacing ground water, and small local drainsheds. Due to the decrease in fresh water, the Marsh is most likely stressed and as a result, the Coastal Commission has limited ground water pumping from the Pillar Point aquifer to less than 240 acre feet per year.

4.1 Wetlands Delineation

The Wetlands Delineation Report prepared by WSP Environmental is provided in *Appendix 4.1*. The report describes the delineation of both Federal and State Wetlands. The Federal wetlands delineation was based on the 1987 Manual with the 2006 Arid West Supplement. The Arid West Supplement allows for the determination of hydrophytic vegetation in areas where excessive disturbance of site hydrology and surface soils has occurred. For land to be declared Federal Wetlands, the presence of wetlands hydrology, hydric soils and hydrophytic vegetation are required. State Wetlands are defined by the California Public Code, which requires only one or more of the parameters for Federal Wetlands.

The presence of wetlands hydrology and hydric soils were the primary factors in determining the extent on the Federal Wetlands. Current wetlands hydrology is controlled by the Maverick's Point Road (constructed by the Air Force in the 1950s), by the drainage pipe from the airport (constructed in the 1940s), and by the county grading (connects the drainage from the airport pipe to the culvert crossing under Maverick's road). The grading of the drainage ditch ends at the northwestern corner of the south parcel at elevation 11 and causes the water to sheet across the south parcel at elevation 9 to 10.5 in the north. This is the primary source of wetlands hydrology on the site. Water sheeting across the south parcel at elevation 9 to 10.5 occurs during every major rain event, resulting in saturation exceeding the 14 consecutive day requirement. During peak flow events, water will backup from the culvert to approximately 8.5 feet. When the WSP team conducted their delineation, hydric soils near the marsh were located at approximately elevation 7.5 (based on Soil Sample elevation in Test Pit 1) and most likely indicated the edge of the historic wetlands prior to agricultural filling. The WSP team noted that hydrophytic plants worked their way up to approximately elevation 10.5, indicating the edge of the State Wetlands. The area of delineated Federal Wetlands is 0.45 acres. The additional area delineated as State Wetlands was 0.29 acres. The State Wetlands delineation includes the land designated as Federal Wetlands for a total of 0.74 acres of State Wetlands.

The Wetlands delineation impacts the project development and will require the following mitigation:

- As required by the approved Local Coastal Plan (LCP), the project will establish a minimum of 100 feet of restored buffer from the boundary of delineated State Wetlands.

Once mitigated, the impacts to existing State and Federal Wetlands (resulting from the project implementation) are less than significant.

4.2 Biological Resources

WSP Environmental conducted rare plant surveys in November 2007 and February 2008. No rare plants were observed on the site. Four rare plant species were observed within two miles of the project site but do not occur on the site due to lack of proper habitat. Development of the site will have no impact to rare plant species.

In February 2008, WSP conducted reconnaissance-level field surveys for special status animals. WSP observed 29 wildlife species on site. A Sharp Shinned Hawk was observed flying over the site. No rare or threatened endangered species were observed on the site. Two special status animal species (*Rana auroa draytonii* or California Red Legged Frog and *Geothlypis trichas sinuosa* or Saltmarsh Common Yellowthroat) were observed on the adjacent property.

The project site consists of two agricultural fields in active crop production, along with minor acreages of waters/wetlands under federal, state and local jurisdictions (less than one half acre of Federal Wetlands and less than three-quarters of an acre of Coastal Commission Wetlands) existing on the site in approximately three to four small locations along the margins of the two fields. Further, no aquatic habitat exists on or immediately adjacent to the site.

Credible observations of the California Red Legged Frog (CRLF) are nearly a decade old, relatively far away and, in the case of Denniston Creek, separated from the project site by roads or other development. More recent surveys (2003) for CRLF have yielded no documented observations of aquatic habitat. The San Francisco Garter Snake (SFGS) and the Western Pond Turtle are highly unlikely to be present on the site. Since CRLF has not been observed, the site is not considered dispersal habitat (it is the professional opinion of WSP that the site has no more likelihood of being CRLF dispersal habitat than virtually any other part of central California). However, as a conservative approach, the Big Wave project assumes “presence” of the CRLF, which will be reflected in careful habitat mitigation measures during project construction.

Since presence is assumed for the CRLF, the project presents a potential impact to special status animals. The following mitigation measures will be enacted during construction to ensure that the impacts are less than significant:

- Prior to construction, a US Fish and Game-approved barrier fence separating the Marsh habitat from the project site will be installed.
- A wetlands biologist will provide training to construction personnel prior and during construction.
- A wetlands biologist will be present during grading operation.
- No mechanical grading will occur within Federal Wetlands.
- A significant wetlands restoration project component (based on regional models with design by a qualified geomorphologist and a coastal wetlands biologist approved by US Fish and Game) will be developed.
- Permanent barriers separating the restored habitat from traffic areas will be installed.

4.3 Design Alternatives

The Wetlands Restoration Design prepared by WSP is provided in *Appendix 4.4*. The following three biological alternatives were evaluated for the project site:

- No Project and continued farming
- Project Development with an unrestored buffer
- Project Development with State and Federal Wetlands restoration

The “no project” alternative includes continued farming, which has significant cultural and economic benefits on the Coastside and will most likely continue without Big Wave. No project and no farming will result in a significant invasive weed crop that will be dominant for years to come. The current Pillar Point Marsh has slowly recovered in the past 30 years but its lack of natural topography and geomorphology resulting from years of farming has not produced a diverse aquatic habitat.

Constructing the project with an unrestored wetlands buffer will generate a significant weed population that will negatively impact the diversity of the existing wetlands.

The third alternative, designing the project with a restored wetlands buffer, will provide a significant functional lift to the marsh. Depressional and foraging wetlands and riparian zones will increase biological diversity.

The project with a restored wetlands buffer is the environmentally superior alternative. As part of this alternative, approximately 50% of the project site will be restored into high-functioning State and Federal Wetlands.

4.4 Wetlands Restoration Design

WSP Environmental's Fiedler-Lee design team has over 30 years of experience in wetlands restoration, with expertise in the San Mateo County Coast. Dr. Peggy Fiedler and Dr. Lyndon Lee have completed the restoration designs for San Pedro and Calera Creek along with numerous other design and construction projects along the coast. The Calera Creek design provided the geomorphology and plant diversity to allow for the CRLF population to increase from three to over 10,000. Bird species counts increased from 20 to over 120. Though CRLF have not recently existed around San Pedro Creek, WSP's San Pedro Creek Restoration provided habitat for the species. The San Pedro Creek Restoration also provided a significant increase in the run of threatened Steelhead Trout.

The proposed design (see *Appendix 4.4*) is based on the Hydrogeomorphic Model (HGM). The HGM model, the apposite model for the San Mateo Coast, is based on detailed studies of 27 watersheds on the San Mateo County Coast between Pacifica and Santa Cruz County. This model determines the appropriate plant mix, topography and residual wood based on natural geomorphology. For the San Pedro Creek project, WSP introduced over 150 species of plants in over 200,000 one gallon pots. Almost 1,000 tons of residual wood was placed in San Pedro Creek. There was an immediate response to this dense planting. After ten years, these restorations are functioning as mature wetlands and riparian zones.

We anticipate that our restoration along Pillar Point Marsh will be a high functioning mature wetlands and riparian zone within 5 to 10 years. Over 28,000 plants will be installed, resulting in a significant reduction of non-native weeds and a significant increase in biological diversity. We also anticipate the potential return of a viable California Red Legged Frog population as part of the restoration effort.

5.0 Site Hydrology and Hazard Analyses

5.1 Hydrology and Flood Hazard

The hydrology for the Wellness Center and the Office Park sites is discussed in *Appendix 5.3*. The hydrology section of the 2002 Fitzgerald Marine Reserve Master Plan is provided in *Appendix 5.3* for reference.

Two small watersheds discharge into Pillar Point Marsh. One watershed runs north and west of Airport Street up to and including a portion of Seal Cove. This watershed encompasses the center of the ridgeline of Pillar Point Headlands and is defined by historic movement of the western spur of the San Gregorio Fault. Approximately 0.5 square miles, it has historically discharged into Pillar Point Marsh. The watershed is seasonal with peak 100 year flows approaching 60 cubic feet per second (cfs). The majority of this watershed discharges into the Marsh from a concrete channel located behind the mobile home park and from drainage along the east side of Airport Street.

The second watershed discharges into the Marsh through a 36 inch culvert located between the Wellness Center parcel and the Office Park Parcel. This watershed includes runoff from Highway 1 and the Airport area. The area of this watershed is approximately 0.65 square miles and is seasonal with a 100 year flow of approximately 80 cfs. This watershed discharged into the Denniston Creek Watershed prior to the construction of the airport in the 1940s. The presence of Holocene alluvial fan deposits in the southern portion of the site indicate that Denniston Creek may have discharged into Pillar Point Marsh in the distant past prior to farming in the early 1900s. Photographs from the 1940s show Denniston Creek in its current location. *Prior to the development of the Airport and agricultural development in the early 1900's, Denniston Creek was most likely the primary source of fresh water to the Pillar Point Creek.*

Without a detailed study of the County Public Works Records, it appears that a storm drain system was installed under Airport Street that discharges into the first watershed to the north of the mobile home park. It also appears that the county upgraded the storm drain system in the airport later by installing the discharge headwall east of Airport Street, constructing the dual 36-inch culverts under Airport Street, and grading a channel to the back corners of both the Wellness Center and the Office Park sites. It appears that this channel was maintained into the 1990s. The elevation of the channel discharge is approximately 10.5 feet. Water discharging from this channel flows across the eastern boundary of the Wellness Center parcel generating flowing and pooling water during every rainfall event.

Other significant features impacting the hydrology include farming during the last century and filling associated with the airport and the access road to the Air Force installation on Pillar Point in the 1940s. The access road cuts across the lower watershed and directs flow through a 48 by 36 arch culvert. Observations of the culvert during a heavy rain storm in January 2008 showed the culvert flowing about 1/3 full with a differential head between the discharge side of the culvert and an intake of over 2 feet. The water in the marsh was ponded (at a depth of about 18 inches) across the entire length of the roadway (approximately 1000 feet) at an elevation of approximately 8.0 feet (two feet below the road surface). The tidally influenced wetlands controlling the discharge were at an approximate elevation of 6 feet. At the time, there was free discharge from the culvert. This observation verifies that the 100 year FEMA flood elevation of 8.5 feet calculated in Letter of Map Amendment (dated November 1, 2005 and provided in *Appendix 5.1*) is accurate.

The regional geological map (provided in the BAGG soils report in *Appendix 6.2.1*) indicates areas of significant fill associated with the airport construction. The map indicates that fill levels may exceed 30 meters in some areas. Runway fill appears to be about 3 meters. As discussed previously, the filling of the runways has most likely directed flow from the second watershed into the Pillar Point Marsh.

In summary, the San Gregorio Fault created the geological features that formed the Pillar Point Marsh and the natural watershed along the bluff equaling an area of 0.5 square miles. Historic farming tilled the wetlands to the base of the Pillar Point Headlands bluff with the exception of the tidally influence wetlands at the mouth of the watershed. The Pillar Point Marsh mouth is brackish and maintains its water surface in the dry season by tidal influence. After 1940, the watershed became seasonal and the farmers tilled their fields through the dry period. During the wet season, the maximum water surface appears to have been about 7.5 feet adjacent to the Wellness Center site prior to the construction of the Radar Station Road in 1940. The construction of the Radar Station Road fixes the 100 year flood level at 8.5 feet. The construction of the County Storm Drain system from the airport results in standing water on the site at elevation 10.5 feet which is the approximate elevation of the Waters of the United States, Corps of Engineers Wetlands determination.

The project design will have the following mitigations to render the impact of hydrology to less than significant:

- All site grading and development will avoid construction in Waters of the United States.
- All facilities will be located above the 100 year flood elevation.
- The standard Corps of Engineers freeboard of 3 feet above the 100 year flood level (Elevation 8.5) will be incorporated into the design for all structures including roadways and parking lots, bringing the minimum site elevation to 11.5 feet.

5.2 Tsunami Hazard

The National Oceanic and Atmospheric Administration (NOAA) has analyzed all tsunami events on the western coast of the United States and has included a validity rank for each event. Only one tsunami was produced locally with a ranking of 2 (1859 Half Moon Bay). Impacts from major tsunamis have been recorded since 1755. The 1906 San Francisco Earthquake (Richter Scale Magnitude 8.3) with an epicenter located one mile north of Pacifica (current USGS estimate) did not cause a tsunami or significant recorded damage to the San Mateo County Coast. It should be noted that significant damage has not occurred in the Santa Cruz area or the Bay Area resulting from recorded earthquake-generated tsunamis. Only the 1946 Alaskan Earthquake produced recorded damage in Princeton Harbor. Boats were carried 1000 feet inland, homes were flooded, the Coast Guard Barracks were damaged, and a fish packing plant was damaged. Even in the absence of a seawall, wave run up from these major events did not reach the southern parcel.

Tsunamis not only require a generation source, they also require a shoreline capable of transferring high velocity/low amplitude energy into low velocity/high amplitude energy. The possibility of significant tsunami impact to Princeton is very remote due to the prominence of the Marin Headland blocking waves to the north and the gradual increase in ocean depth to the west. The ocean depth a mile offshore is approximately 45 feet. This causes large wave energy to be dissipated offshore. The construction of the Princeton Harbor Seawall in the 1960s has greatly reduced the hazard to the site.

Locally generated tsunamis are not likely. Most faults in the Bay Area are strike slip faults and not dip slip faults that cause events like the Sumatra Tsunami. In recent history Half Moon Bay has had offshore waves exceeding 50 feet (the surf point at Mavericks experienced waves with faces approaching 100 feet in 1995) that have not caused any local damage. A 90-foot wave would break a few miles offshore at Pillar Point and the energy would dissipate prior to reaching shore due to gradually decreasing ocean floor depth. The devastation that has occurred in the Philippines, Sumatra, India and Hawaii is due to the ocean floor rapidly increasing in depth, which allows extremely large waves to break on shore. Additionally, areas near sea level like Banda Aceh are easily inundated.

The worst case scenario is a series of smaller waves at high tide, breaking in the 8 to 12 foot range and impacting the shore at intervals of 5 to 90 minutes. This may overtop the Harbor seawall but

no serious wave run-up would occur in Princeton Harbor. Even if significant wave run-up occurs in the harbor, the elevations around the proposed site drop to the south through a thick wall of riparian vegetation. The site drains well. Ocean flooding could occur further south in the Princeton area but is unlikely at the proposed site. The most likely result of a Pacific Rim tsunami impacting Half Moon Bay and Princeton Harbor is a series of rapidly rising and falling tides (Seiche) similar to what was caused by the 1946 and 1964 Alaskan Earthquakes. Seiche tides may cause some flooding at elevations less than 20 feet.

The last major tsunami to impact the Bay Area was the 1964 event triggered by the Alaskan Earthquake. The 1964 Alaskan Earthquake was the largest earthquake ever recorded in North America and one of the largest ever recorded in the world. The USGS listed it as an 8.6 surface magnitude with a 9.2 moment magnitude (mw). The 2004 Sumatra Earthquake was rated at 9.0 mw. A sudden uplift of the Alaskan seafloor caused a tsunami, which was responsible for 131 deaths. The north shore of Hawaii was devastated by massive waves. The tsunami propagated wave speeds of over 400 miles per hour. Sixteen people died in Oregon and California, 10 died in Crescent City where fallen giant redwood trees clogged the city streets. Seiche tides caused extensive damage to San Francisco Bay marinas and in waterways as far as the Gulf of Louisiana. The tide rose and fell rapidly in the Bay Area but did not cause any inland flooding. Princeton was not affected by this tsunami.

Even though there is no historical or geological record that indicates this stretch of the coast is prone to tsunamis, the entire site is listed by ABAG and FEMA to be within a tsunami evacuation zone.

All areas along the north Pacific coast at an elevation of 42 feet or less are zoned for evacuation. As summarized ABAG, the NOAA model generated by Dr. Kanoglu of USC is not based on a recurrence interval because there is not enough historical data in California. "It is based on potential earthquake sources and hypothetical extreme landslide sources." It is stated in the plan "that the tsunami inundation map is intended as a 'worst case' scenario based on limited historic records. The map is for evacuation planning uses only; it is not an 'official' state map to be used for land use planning and real estate disclosure requirements" (ABAG County Tsunami Maps).

Since the project is within the Tsunami Evacuation Zone, the following mitigations will be incorporated to ensure that the impacts are less than significant:

- Develop an evacuation plan approved by the County Operation of Emergency Service (OES) and Fire Department for fires (most likely scenario, once in 20 year event), earthquake (less likely, once in 100 year event), and tsunami (extremely rare, once in 200 year event for very minor damage). Tsunami evacuation will follow the existing County evacuation plan. Schedule monthly training exercises for all events.
- Coordinate with the County OES to receive tsunami evacuation warning directly. Install a public address system in the facility.
- Incorporate heavy vegetation and wattle fencing to slow down velocity of wave run up and debris flow.
- Consider wave run up and debris flow in the structural design of the Office Park and Residential housing
- Maintain floor slab elevations above elevation 15 feet (which exceeds the estimated run up elevation for the 200 year event).

5.3 Global Warming Hazard

The U.S Geological Survey (USGS) has documented the rise of the earth's sea level over the past 100 years from 10 to 25 cm depending on location. The International Panel of Climate Change (IPCC) 2007 report suggests a range of sea level rise by 2100 of 18 to 59 cm (7.1 to 31.1 inches). Many factors

are difficult to model with great certainty or accuracy, in particular ice sheet flow. Therefore, a reasonable estimate for a range in sea level rise is 18 to 79 cm (7.1 to 31.1 inches or .59 to 2.6 feet).

The Global Warming Hazard has an impact on the development of the site and the project design will have the following mitigation to render the impact less than significant:

- Establish the first floor elevation 2.6 feet (maximum estimated sea level rise in the next 100 years) above the 100 year flood freeboard which brings the minimum site elevation to 14.1 feet.

5.4 Analyses for Minimum Site Grade and Building Floor Elevations

The 100 year flood elevation for the Project Site is 8.5 feet. The maximum 100 year sea level rise projection including the uncertainty factor is 2.6 feet. Eyewitness to 1946 Alaskan Earthquake observed boats floating as far as 1000 feet inland and damage to the structures on the shoreline. This correlates with an elevation of approximately 10 feet (three to four feet above normal).

Grading mitigation is required to insure that impacts are less than significant for the combined 100 year frequency flood, the 200 year frequency tsunami, and the 100 year maximum projected sea level rise. Combining these three events yields a minimum site elevation of 15 feet. The Corps of Engineers generally recommends a 3 foot freeboard for all of their flood and hazard projects. This yields a minimum first floor elevation of 18 feet.

5.5 Groundwater Hydrology

The groundwater hydrology of this area was reviewed in detail in the May 2002 Fitzgerald Marine Reserve Master Plan. The hydrology section from the Master Plan is attached in *Appendix 5.3*. The plan states that over 90 wells are operated in the El Granada and Moss Beach area. The Plan sites numerous safe yield studies performed on the Half Moon Bay Terrace ground water Basin at the Airport. The consensus of the studies is that, “despite periodic lowering of the groundwater by pumpage, rainfall runoff and recharge on the terrace and from Denniston Creek provide sufficient water to reverse the drawdown effects and most probably, inhibit seawater intrusion into the groundwater basin. In addition these studies agree that the overall groundwater gradient in the terrace formation indicates a condition of groundwater discharge in the area of the marsh.”

The Big Wave Project operates an agricultural well that has a safe yield between 20 and 50 gallons per minute. It is intended that even after project development, the well will continue to be used to increase farm production. Protecting the ground water from salt water intrusion is critical to the success of this well and other wells within the aquifer.

To maximize ground water recharge, surface water runoff must be minimized. This is also required by the San Mateo County Water Pollution Prevention Program (SMCWPPP) provision C.3.c.i.3. To minimize hard surface runoff, all roof water can be collected and treated in a rainwater garden infiltration system as described in Chapter 1 and *Appendix 4.4*. These systems constructed on granular soil will allow about 50% of the rainwater to infiltrate and 30% to dissipate through evapotranspiration. Permeable concrete walk ways and parking lots can infiltrate 80% of the rainwater if designed for infiltration rates of 0.5 inches per hour. Parking lot infiltration and rain water gardens both provide good bacterial and nutrient removal. Slow infiltration below parking lots maintains an active population of bacteria that provide biological decomposition of oil and organic dirt. This soil culture also provides an extremely competitive environment that does not allow pathogenic organisms to survive in more than the top few feet of soil.

The average rainfall in the area is approximately 22 inches per year. The project has approximately 4 acres of roof top area and 6 acres of parking lot and walkways. The remaining 10 acres are restored wetlands and native plant landscaped areas. The areas of restored wetlands and farming primarily shed water through evapotranspiration and surface runoff due to the tight nature of the required organic soils. The estimated groundwater recharge is approximately 1,000,000 gallons per year or about 2,500 gallons per day for the roof water and approximately 3,000,000 per year or about 7,500 gallons per day for the permeable hard surfaces. As long as the pumped amount from the agricultural well does not exceed the infiltration amount, the safe yield for the Pillar Point Marsh aquifer will not be impacted.

The following mitigation measures are required to meet the County NPDES Standards C.3 for runoff and protection of the Pillar Point Marsh aquifer:

- For continued well pumping and compliance with SMCWPPP Provision C.3, all roof water runoff will be treated in rain garden infiltration systems that will capture 80% of the first flush and 80% of the annual rainfall.
- For continued well pumping and compliance with SMCWPPP Provision C.3 all hard surfaces will be constructed with permeable concrete that will capture and infiltrate 80% of first flush and 80% of annual rainfall.
- To protect the safe yield of the Pillar Point Marsh aquifer, groundwater utilized domestically and for irrigation will not exceed the designed infiltration amount for project infiltration systems.

6.0 Site Geology and Soil Investigation

6.1 Site Geology

The project is located on the Half Moon Bay Terrace formed by alluvial fan and stream terrace deposits of the Denniston Creek watershed. The San Vicente Creek watershed has also been a historic contributor to the Terrace deposits. The Terrace rests on the wave cut platform of the Purisima Formation (Pliocene and upper Miocene) cemented marine sandstones, silt stones and mud stones that may be as deep as 60 feet below sea level at the Pillar Point Marsh. The older terrace deposits of the Pleistocene Age (Glacial Period) consist of poorly consolidated gravel and sand layers interspersed with tidally influenced clays and silt lenses. The presence of windblown sand is also observable in the boring logs. Some colluvium from the Pillar Point Ridge is also present in the site strata. During periods of significant global ice, the strata are primarily alluvium. Between ice periods with higher ocean levels, the strata are primarily tidally influenced. The presence of granitic detritus from the Montara Mountain Formation is observable in many of the site borings. The presence of Holocene (Younger) near surface deposits reflect the varying Denniston Creek mouth locations and its impacts on the site.

The Half Moon Bay Terrace, displaced and deformed by the San Gregorio fault, is a key feature. Tectonic activity has forced the Pillar Point Bluff upwards and the Half Moon Bay Terrace near the Pillar Point Marsh downwards. The San Gregorio fault is the principal active fault west of the San Andreas Fault. The San Gregorio fault is located approximately 500 feet west of the project site. The San Andreas Fault is located 10 miles to the east. The most recent event (MRE) for the San Andreas Fault was the 1906 fault with an estimated Moment Magnitude of 7.9.

Trench excavations of the San Gregorio in Moss beach reveal five Holocene active strands, a single mid Holocene thrust fault and four late Holocene near vertical strike slip faults. The most recent event (MRE) for the San Gregorio Fault is estimated to have occurred between 1270 AD and 1400 AD with a Moment Magnitude of 7 (Bulletin of the Seismological Society 1997). Due to the close proximity of the San Gregorio Fault, the Significant Earthquake Scenarios prepared by ABAG, lists shaking intensity as X (very violent).

The main seismic hazards associated with the San Gregorio fault are surface rupture, shaking, non-saturated densification and liquefaction of the unconsolidated saturated granular terrace soils. Lateral spreading is unlikely due to the lack of site grade and the flat subsurface of the wave cut Purisima Formation that is supporting the Half Moon Bay Terrace.

Development near known active faults in California is subject to the requirements set forth in the Alquist-Priolo Special Studies Zone Act. The Act is intended to prevent the development of structures across active fault traces to mitigate the hazard associated with surface rupture. The State Division of Mines has issued maps showing the location of active faults and has identified "Special Study Zones" within which site specific investigations (trenching) must be performed to assess the presence of active fault traces. The edge of the mapped special study zone transects the north western corner of the Office Park Site.

The Geological Conditions Section of the 2002 Fitzgerald Marine Reserve Master Plan is provided in *Appendix 6.1* for reference.

6.2 Geotechnical Investigation

The Big Wave contracted with the Bay Area Geotechnical Group (BAGG) in 2000 for the Wellness Center Site (provided in *Appendix 6.2.1*) and 2002 for the Office Park Site (provided in *Appendix 6.2.2*). Fourteen borings for the Office Park Site and nine borings for the Wellness site ranging from 20 to 50 feet were drilled and investigated. The borings identified the upper soils (12 inches to 24 inches) ranging from a silty, clayey sand on the Wellness Center site to a silty clay on the office park site. The descending soil layers contain well graded sands, silty sands with clay and gravel layers. The gradual soils vary from dense to varying levels of consolidation. BAGG estimates that the surface clayey soils will consolidate with the thicker subsurface clays in the Wellness Center causing settlements of 0.5 to 3.5 inches.

Seismic induced liquefaction of the saturated unconsolidated granular soils is considered moderate and is estimated to result in building settlement ranging from 0.5 to 3.5 inches. The surface clays are expansive.

The BAGG reports have preliminary recommendations based on the construction of single story light weight structures and recommend further investigation based on the final selection of the structures and grading plans. The preliminary reports do not identify any issues that cannot be addressed with sound engineering design and practices.

It is understood that the BAGG reports are for planning purposes only and that a detailed final report will be prepared during the final design. The report recommends the removal and re-compaction of the expansive soils located under slabs and pavement structures. To reduce static and seismic induced settlement, the report recommends a 4 foot soil surcharge over the developed areas of the site. Shallow footings are acceptable for one story structures. The BAGG report also recommends 18 inches of engineered fill below each building. BAGG recommends against drilled piers due to the presence of high ground water and unconsolidated surface soils.

6.3 Contaminated Soils

The Phase 1 Environmental Site Assessment, prepared by Treadwell and Rollo on March 26, 2007 (provided in *Appendix 9.1*), identified the possible use of pesticides associated with farming from the 1930s as the only possibility of petroleum based pollutants and the only environmental condition. The Fitzgerald Marine Reserve Master Plan (see *Appendix 6.1*) identifies roadway and airport runoff as an additional source of petroleum based pollutants.

6.4 Building Code Requirements

The preliminary geotechnical recommendations are based on the 1997 Uniform Building Code. The 2007 State mandated Building Code for detailed design. Seismic parameters for shaking, vertical and horizontal loads and liquefaction will be based on the new code.

6.5 Geotechnical Peer Review

Treadwell and Rollo reviewed the 2002 BAGG report for the Office Park, but did not review the 2000 BAGG report on the Wellness Center. Treadwell and Rollo's Third Party Geotechnical Review is attached in *Appendix 6.5.1*. They list the primary concerns as seismic hazards, expansive near surface soils and foundation selection. Treadwell and Rollo included the following recommendations:

1. Use advancing rotary wash borings and cone penetration tests (CPT) to better evaluate liquefaction in some additional 50 feet deep holes.

2. Building Design should focus on resistance to high intensity shaking.
3. Locate structures outside of the Alquist-Priolo special study zones.
4. Perform additional engineering evaluation to better describe seismic settlement.
5. Perform additional engineering evaluation to better describe static settlement.
6. Perform additional laboratory evaluations to better describe the success of site surcharging.
7. Shallow foundations should rest on non-expansive engineered fill.
8. Deepen spread footings to be supported on soils below seasonal moisture fluctuation.
9. Slab on grad footings should be supported on non-expansive engineered fill.
10. Utilize a stiffened foundation capable of resisting differential settlement.
11. Foundations will need to be designed to accommodate up to 6 inches of seismically induced settlement and up to 3 inches of differential settlement in a 50 foot distance.
12. Prepare a detailed subgrade design for the permeable parking lot pavement associated with the expansive surface soils to avoid ponding and other types of conditions that may cause failure.
13. Prepare a detailed design for the bridge footings. (It should be noted that there is no bridge in the current design.)

In summary, they recommend that final design should better address seismic hazards, static and dynamic settlement, expansive surface soils and overall foundation design. They also disagree with the conclusions about the success of site surcharging. They also feel that seismic settlement may be in the order of 0-6 inches instead of 0.5 inches to 3.5 inches with differential settlement being over 3 inches.

Treadwell and Rollo concluded that the project is feasible from a geotechnical standpoint provided that their review comments are adequately addressed in the final design soils report.

BAGG prepared a response to Treadwell and Rollo's Third Party Geotechnical Review and a proposal that incorporates Treadwell and Rollo's recommendations (see *Appendix 6.5.2*).

6.6 Recommendations and Mitigations

The following recommendations will reduce the geological hazards and adverse soil conditions to less than significant:

- BAGG will prepare a final design geotechnical report during the final design phase that will address the Treadwell and Rollo concerns. Four additional boring exceeding 60 feet deep (ideally into the Purisima Formation) will be drilled utilizing cone penetration tests. Samples will be tested in the lab to determine the pre-consolidation pressure, the compression index and the consolidation index. The Big Wave Team will organize a series of conference meetings between BAGG and Treadwell and Rollo to finalize the foundation selection and design.
- The geological hazard of surface displacement is mitigated by placing all structures outside of the Alquist-Priolo special studies zone.
- The severe earth quake shaking hazard will be mitigated by utilizing steel frame construction for the Office Park and a combination of steel framing or concrete tilt-up and modular bolted wood structures for the Wellness Center. All structures will be designed by a Structural Engineer for current State Mandated Building Code with the new special seismic requirements.
- Expansive soils will be removed from below the parking lot substructure. This will guarantee good subdrainage and provide quality soil for the wetlands restoration. Building foundations will penetrate below the expansive soils either by over-excavating spread footings, installing piles or piers or by removal and recompaction of non-expansive engineered fill.

- The possible presence of contaminated agricultural soils will be mitigated by sampling and testing every 1000 cubic yards of soil displaced. Soil exceeding limits set by the EPA will be removed from the site. It is important to note that this scenario is very unlikely.
- Settlement due to static loading and dynamic seismic loading will be mitigated by the foundation design recommended by BAGG and Treadwell and Rollo. Design options include excavation and re-compaction of a soil mass exceeding eighteen inches; deep foundation possibly including concrete piers or steel or concrete piles. A rigid foundation limiting differential settlement will be required. Bolt on foundation supports will be utilized to insure that if differential settlement occurs, adjustments to the building elevations can be made without major structural changes.
- The preliminary geotechnical recommendations are based on the 1997 Uniform Building Code. The 2007 State mandated Building Code for detailed design. Seismic parameters for shaking, vertical and horizontal loads and liquefaction will be based on the new code.

7.0 Traffic Analyses

7.1 Traffic Report

The traffic report was prepared by Hexagon Transportation Consultants Inc. and is attached in *Appendix 7.1*. The traffic report analyzed three alternatives: the first alternative includes 156,000 square feet of Class A office space in the Office Park, the second alternative analyzes 225,000 square feet of Class A office space in the Office Park and the third alternative (the Proposed Project Alternative) analyzes a more mixed use Office Park. The first two alternatives analyze the Wellness Center with a larger square footage of commercial and visitor serving recreational development. The third alternative analyzes the Wellness Center as proposed.

Table 7.1.1 illustrates Alternative 1 with 156,000 square feet of Class A office space.

Table 7.1.1: Project Trip Generation Estimate - Alternative 1: 156,000 ft² Office Space

| Use | Size ft ² | Daily | | AM Peak Hour | | | PM Peak Hour | | | | | |
|-------------------------|----------------------|-------|-------|--------------|----------|-----------|--------------|------|----------|-----------|-------------|--|
| | | Rate | Trips | Rate | Trips In | Trips Out | Total Trips | Rate | Trips In | Trips Out | Total Trips | |
| Wellness Center: | | | | | | | | | | | | |

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|---|-----|--------|-------|------|------|------|-----|-----|------|------|-----|-----|-----|
| Employee Apartments: (Live in Residents that do not commute) | | | | | | | | | | | | | |
| 1 Bedroom | | 10 | 6.72 | 67 | 0.51 | 1 | 4 | 5 | 0.62 | 1 | 5 | 6 | |
| 2 Bedrooms | | 3 | 6.72 | 20 | 0.51 | 0 | 1 | 2 | 0.62 | 0 | 1 | 2 | |
| 3 Bedrooms | | 3 | 6.72 | 20 | 0.51 | 0 | 1 | 2 | 0.62 | 0 | 1 | 2 | |
| DD Housing Units (Residents do not Drive) | | 50 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | |
| Commercial (Dog Grooming, Laundry Service for residents and office park drop pickup and drop off) | | 10000 | 42.94 | 429 | 1.03 | 6 | 4 | 10 | 3.75 | 18 | 20 | 38 | |
| Storage | | 20000 | 4.96 | 99 | 0.45 | 7 | 2 | 9 | 0.47 | 2 | 7 | 9 | |
| Community Center (Pool and Fitness) | | 20000 | 33.8 | 676 | 4.7 | 86 | 8 | 94 | 2.19 | 25 | 19 | 44 | |
| Wellness Center Total: | | | | 1312 | | 101 | 20 | 122 | | 46 | 53 | 101 | |
| Commercial Office Park: | | | | | | | | | | | | | |
| General Office: | 69% | 156000 | | 11 | 1716 | 1.55 | 213 | 29 | 242 | 1.49 | 40 | 192 | 232 |
| Research and Development: | 0% | 0 | 8.1 | 0 | 1.24 | 0 | 0 | 0 | 1.08 | 0 | 0 | 0 | |
| Storage: | 0% | 0 | 4.96 | 0 | 0.45 | 0 | 0 | 0 | 0.47 | 0 | 0 | 0 | |
| Manufacturing | 0% | 0 | 2.1 | 0 | 0.73 | 0 | 0 | 0 | 0.74 | 0 | 0 | 0 | |
| Office Park Total Area | 69% | 225000 | | | 1716 | | 213 | 29 | 242 | | 40 | 192 | 232 |
| Total Development: | | | | 3028 | | 313 | 49 | 364 | | 86 | 246 | 333 | |

Table 7.1.2 illustrates the Proposed Alternative with 225,000 of Class A office space.

Table 7.1.2: Project Trip Generation Estimate - Alternative 2: 225,000 ft² Office Space

| Use | Size ft ² | Daily | | | AM Peak Hour | | | PM Peak Hour | | | | |
|---|----------------------|-------|-------|-------|--------------|----------|-----------|--------------|------|----------|-----------|-------------|
| | | Rate | Trips | Trips | Rate | Trips In | Trips Out | Total Trips | Rate | Trips In | Trips Out | Total Trips |
| Wellness Center: | | | | | | | | | | | | |
| Employee Apartments: (Live in Residents that do not commute) | | | | | | | | | | | | |
| 1 Bedroom | 10 | 6.72 | 67 | 0.51 | 1 | 4 | 5 | 0.62 | 1 | 5 | 6 | |
| 2 Bedrooms | 3 | 6.72 | 20 | 0.51 | 0 | 1 | 2 | 0.62 | 0 | 1 | 2 | |
| 3 Bedrooms | 3 | 6.72 | 20 | 0.51 | 0 | 1 | 2 | 0.62 | 0 | 1 | 2 | |
| DD Housing Units (Residents do not Drive) | 50 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | |

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|---|------|--------|-------|-------|------|------|-----|----|-----|------|-----|-----|-----|
| Commercial (Dog Grooming, Laundry Service for residents and office park drop pickup and drop off) | | | 10000 | 42.94 | 429 | 1.03 | 6 | 4 | 10 | 3.75 | 18 | 20 | 38 |
| Storage | | | 20000 | 4.96 | 99 | 0.45 | 7 | 2 | 9 | 0.47 | 2 | 7 | 9 |
| Community Center (Pool and Fitness) | | | 20000 | 33.8 | 676 | 4.7 | 86 | 8 | 94 | 2.19 | 25 | 19 | 44 |
| Wellness Center Total: | | | | | 1312 | | 101 | 20 | 122 | | 46 | 53 | 101 |
| Commercial Office Park: | | | | | | | | | | | | | |
| General Office: | 100% | 225000 | | 11 | 2475 | 1.55 | 307 | 42 | 349 | 1.49 | 58 | 278 | 335 |
| Research and Development: | 0% | 0 | | 8.1 | 0 | 1.24 | 0 | 0 | 0 | 1.08 | 0 | 0 | 0 |
| Storage: | 0% | 0 | | 4.96 | 0 | 0.45 | 0 | 0 | 0 | 0.47 | 0 | 0 | 0 |
| Manufacturing | 0% | 0 | | 2.1 | 0 | 0.73 | 0 | 0 | 0 | 0.74 | 0 | 0 | 0 |
| Office Park Total Area | 100% | 225000 | | | 2475 | | 307 | 42 | 349 | | 58 | 278 | 335 |
| Total Development: | | | | | 3787 | | 408 | 61 | 471 | | 103 | 331 | 436 |

Table 7.1.3 illustrates the Proposed mixed use office space with the proposed Wellness Center area.

Table 7.1.3: Project Trip Generation Estimate - Proposed 225,000 Mixed Office

| Use | Size ft ² | Daily | | | AM Peak Hour | | | PM Peak Hour | | | Total Trips | |
|---|----------------------|-------|-------|-------|--------------|----------|-----------|--------------|----------|-----------|-------------|--|
| | | Rate | Trips | Trips | Rate | Trips In | Trips Out | Rate | Trips In | Trips Out | | |
| Wellness Center: | | | | | | | | | | | | |
| Employee Apartments: (Live in Residents that do not commute) | | | | | | | | | | | | |
| 1 Bedroom | 10 | 6.72 | 67 | 0.51 | 1 | 4 | 5 | 0.62 | 1 | 5 | 6 | |
| 2 Bedrooms | 3 | 6.72 | 20 | 0.51 | 0 | 1 | 2 | 0.62 | 0 | 1 | 2 | |
| 3 Bedrooms | 3 | 6.72 | 20 | 0.51 | 0 | 1 | 2 | 0.62 | 0 | 1 | 2 | |
| DD Housing Units (Residents do not Drive) | 50 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | |
| Commercial (Dog Grooming, Laundry Service for residents and office park drop pickup and drop off) | 1117 | 42.94 | 48 | 1.03 | 1 | 0 | 1 | 3.75 | 2 | 2 | 4 | |
| Storage | 20000 | 4.96 | 99 | 0.45 | 7 | 2 | 9 | 0.47 | 2 | 7 | 9 | |

| | | | | | | | | | | | | |
|--|------|--------|------|------|------|-----|----|-----|------|----|-----|-----|
| Community Center (Pool and Fitness) | | 4647 | 33.8 | 157 | 4.7 | 20 | 2 | 22 | 2.19 | 6 | 4 | 10 |
| Wellness Center Total: | | | | 412 | | 29 | 10 | 41 | | 11 | 21 | 34 |
| Commercial Office Park: | | | | | | | | | | | | |
| General Office: | 40% | 90000 | 11 | 990 | 1.55 | 123 | 17 | 140 | 1.49 | 23 | 111 | 134 |
| Research and Development: | 25% | 56250 | 8.1 | 456 | 1.24 | 61 | 8 | 70 | 1.08 | 10 | 50 | 61 |
| Storage: | 15% | 33750 | 4.96 | 167 | 0.45 | 13 | 2 | 15 | 0.47 | 3 | 13 | 16 |
| Manufacturing | 20% | 45000 | 2.1 | 95 | 0.73 | 29 | 4 | 33 | 0.74 | 6 | 28 | 33 |
| Office Park Total Area | 100% | 225000 | | 1708 | | 226 | 31 | 257 | | 42 | 202 | 244 |
| Total Development: | | | | 2119 | | 255 | 41 | 298 | | 53 | 223 | 278 |

Under the Project Traffic Impacts and Mitigation Measure section of the traffic report, it is stated that, “the analysis showed that Alternative 1 [the Wellness Center and 156,000 square feet of office space] would not cause any significant impacts either alone or cumulatively on traffic conditions at the signalized and un-signalized study intersections.” Alternative 2 (the Wellness Center and 225,000 cubic feet of office space) would cause a traffic impact at the intersection of Cypress and Highway 1 in the evening and would require a signal to reduce the impacts to less than significant.

The Proposed Project illustrated in *Table 7.1.3* has lower daily, AM Peak and PM Peak trip generation and will not cause any significant impacts either alone or cumulatively on traffic conditions at the signalized and un-signalized study intersections.

There are no proposed offsite traffic mitigations required.

7.2 Site Access, Parking and Circulation

Site Access:

The Wellness Center provides two, two-way access points to Airport Street. A 20-foot wide wetlands trail will provide fire access. The trail will be paved with porous concrete for wheel chair accessibility and will provide fire access to both sides of all buildings on the site. Native grass will be planted in the porous concrete. Wheelchair paths will be built for observing the restored wetlands.

Parking:

The Wellness Center has 73 parking spaces for staff and visitors. The majority of the staff will live at the wellness center. It is assumed that the DD residents will not drive. The following table, *Table 7.2.1*, illustrates the parking spaces required for the Wellness Center.

Table 7.2.1: Wellness Center Floor Areas and Parking Requirement

| First Floor Areas | Parking Spaces |
|-------------------|------------------------------------|
| Pool Room | 3464ft ² 20guest spaces |

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| | | |
|-------------------------------------|----------------------------|----------------------------|
| Pool Equipment Room | 372.4ft ² | |
| Men's Locker Room | 372.4ft ² | |
| Women's Locker Room | 372.4ft ² | |
| Fitness Center | 1117.2ft ² | 13 guests spaces |
| Kitchen | 1488ft ² | 3 employee spaces |
| Lobby | 1320ft ² | |
| Dining Room | 2578ft ² | |
| Offices | 1862ft ² | 3 employee spaces |
| Dog Grooming | 372.4ft ² | 4 visitors spaces |
| Laundry | 744.8ft ² | 4 drop off/pickup spaces |
| Maintenance/Janitorial | 1489.6ft ² | 3 employee/ service spaces |
| Single Bed/Bath Unit (6 total) | 2234.4ft ² | |
| Elevator/Stair Units (2 total) | 744.8ft ² | |
| Double Unit / One Bedroom (3 total) | 2234.4ft ² | 1 employee space |
| Hallways | 1834.2ft ² | |
| First Floor Total | 22601ft² | |
| Second Floor Areas | | |
| Single Bed/Bath Unit (12 total) | 4468.8ft ² | |
| Elevator/Stair Units (2 total) | 744.8ft ² | |
| Double Unit / One Bedroom (7 total) | 5213.6ft ² | 3 employee space |
| Hallways | 1834.2ft ² | |
| Offices/Meeting Rooms | 5897.6ft ² | |
| Second Floor Total | 18159ft² | |
| Third Floor Areas | | |
| Single Bed/Bath Unit (1 total) | 372.4ft ² | |
| Elevator/Stair Units (2 total) | 744.8ft ² | |
| Double Unit / One Bedroom (1 total) | 744.8ft ² | |
| Triple Unit/Two Bedrooms (5 total) | 5586ft ² | 5 employee space |
| Four Unit/Two Bedrooms (2 total) | 2979.2ft ² | |
| Hallways | 2034.2ft ² | |
| Offices | 744.8ft ² | |
| Theatre | 2280ft ² | |
| Living Room | 4690.8ft ² | |
| Third Floor Total | 20177ft² | |

| | | |
|--|----------------------------|-------------------------|
| Storage Building | 20000ft² | 10in/out spaces |
| Four Bedroom Breezeway (5 total) | 17848ft² | 4employee spaces |
| | | |
| Total Wellness Center Building Area | 78785 | |
| Total Parking Spaces Required | | 73parking spaces |

The total number of parking spaces for the Office Park is 640 spaces in the main lot. The County parking ordinance requires one space for every 200 square feet of office space. The County ordinance does not specify parking requirements for lower density uses. It is assumed that that parking requirements are directly related to trip generation for office parks. *Table 7.2.2*, on the following page, illustrates the proposed area and use of the office park and the parking required based on the existing ordinance and the parking required based on a parking exception allowing 250 square feet of office equivalent per parking space. In accordance with the existing ordinance of one space for every 200 square feet, 776 parking spaces would be required. Only 621 spaces would be required if an exception of 250 square feet per parking space was granted. Most cities in San Mateo with public transportation allow one space for every 250 square feet of office space.

| Proposed Use | % Area | Area ft² | Trips / 1000 ft² | Total Trips | Office Trip Equiv. Ratio¹ | Office Space² | Parking Spaces Req.: 200 ft² / space³ | Req. Parking Exception: 250 ft² / space⁴ |
|---------------------------|---------------|----------------------------|------------------------------------|--------------------|---|---------------------------------|--|---|
| General Office: | 40% | 90000 | 11 | 990 | 1 | 90000 | 450 | 360 |
| Research and Development: | 25% | 56250 | 8.1 | 456 | 0.74 | 41420 | 207 | 166 |
| Storage: | 15% | 33750 | 4.96 | 167 | 0.45 | 15218 | 76 | 61 |
| Manufacturing | 20% | 45000 | 2.1 | 95 | 0.19 | 8591 | 43 | 34 |
| <i>Total =</i> | 100% | 225000 | | 1708 | | 155230 | 776 | 621 |

1. Office Trip Equivalency Ratio is the ratio of trips for different commercial uses as compared to General Office
2. Office Space times the Equiv. Ratio results in the office space that would generate the same number of trips.
3. Current Parking Ordinance is one space for every 200 square feet of office space (or equivalent office space).
4. Parking exception of one space for every 250 ft² of equivalent Office Park, 621 parking spaces are required.
5. Proposed Office Park provides 640 parking spaces; the 250 ft² of office space per parking space exception is ok.

Table 7.2.2: Office Park Parking Requirement

Trails:

The project also provides 1,700 feet of multi-purpose trail along Airport Street and 950 feet of improved trail connecting to the POST (Peninsula Open Space District) property to the west. The project repairs the broken pavement along the Montara Sanitary District Sewer Line Easement along the property's northern border.

The following mitigations are required for parking to reduce the impact to less than significant:

- Grant a parking exception allowing one parking space for every 250 square feet of equivalent office space.
- Implement innovative parking options if required for parking exception of 1 parking space for every 250 square feet of office space versus the parking ordinance required one parking space for every 200 square feet of office space.

7.3 Innovative Parking Options

The County may agree to reduce the number of required parking spaces to one space for every 250 square feet of office space if the following mitigation measures are shown to be successful. One parking space per 250 square feet of office space is a more reasonable goal because the current professional climate dictates larger offices than those utilized when the County General Plan was adopted. Also current energy and air pollution policies are designed to minimize the number of cars for commuting. One space per 250 square feet of office space represents approximately 20% of the office users utilizing ride sharing, park and ride facilities and public transportation. This will reduce the parking volume required without causing significant impacts.

- Implement parking procedures that result in office workers utilizing ride sharing, shuttle service to park and ride lots, and public transportation. This would allow the County to decrease parking to one space for every 250 square feet of equivalent office space.
- Increase the San Mateo County Transit Authority Bus Service along Airport Street.
- Provide Shuttle Bus Service from the Park and Ride located in Pacifica, Princeton and Half Moon Bay.
- Extend multi-purpose bike and walking trails connecting the project to parks and services. These trails will include the trail to the Post Ridge property and the multipurpose trail along Airport Street and Princeton.

7.4 Regional Traffic Impact

As stated in the Traffic Report, “the proposed project would not have a significant regional impact on Highway 1 and Highway 92 traffic. The office use portion of the project would add a service not currently available in the project vicinity, potentially providing employment for residents who typically travel to jobs in other areas. Thus, this land use could reduce traffic currently traveling southbound on Highway 1 to Highway 92 and over the hill to I-280.

“The addition of residential land use in this area would normally increase traffic traveling southbound on Highway 1 and eastbound on Highway 92. However, this particular residential use is unique. The portion of the planned apartments that are for the developmentally disabled would not generate additional traffic as the residents will either not drive to jobs or will be employed on the project campus.”

Based on the traffic report, it can be estimated that the project will reduce the number of traffic trips in the AM and PM at each intersection along Highway 1 and Highway 92 by up to 200 trips per peak

hour and up to 1,700 trips per day. This represents a reduction in peak traffic load on Highway 1 by 10% or more just by reversing the commute direction.

7.5 San Mateo County Traffic Mitigation Requirements

San Mateo County requires mitigation fees from new development for local road and drainage improvements. In addition, the City/County Association of Governments (C/CAG) requires local jurisdictions to mitigate traffic impacts on designated roads resulting from large-scale development (generating more than 100 peak hour trips). Mitigation can involve requiring fees or Transportation Demand Measures (TDM). Typical TDMs include establishing a shuttle service, subsidizing transit for employees, charging for parking, establishing a carpool/van pooling program, or having a compressed work week.

If the County requires the above TDMs, Big Wave will implement them. If the County also imposes a traffic mitigation fee, Big Wave requests that the fee be applied to the cost of increase Samtrans bus services. To make the County Traffic Mitigation Fee less than significant, the following mitigation will be implemented:

- If the County assesses Traffic Mitigation fees and agrees that the fees will be applied to the cost of the Intersection, Big Wave will contribute its fair share toward increased Samtrans bus service between Pacifica, the Project and Downtown Half Moon Bay.

8.0 Services and Utilities

8.1 Wastewater

The Big Wave Project will generate approximately 26,000 gallons per day (gpd) of domestic wastewater. The Project is a combined residential and office park development. There is no anticipation that any industrial or hazardous waste will be generated by the project. The Wellness Center will generate approximately 6000 gpd of wastewater (85 gallons per day per person, including staff). This is a conservative value and could be reduced with water conserving fixtures. The Office Park will generate approximately 20,000 gpd of wastewater (20 gallons per person for maximum density, based on minimal shower and cooking facilities). The total wastewater solids are estimated to be 130 dry pounds per day. Big Wave is proposing a water recycling system to reuse treated wastewater for toilet flushing. We propose to reuse approximately 16,000 gallons per day for toilet flushing. The water recycling plant includes a 15,000 gallon storage tank for irrigation during dry periods. This storage tank will be used for flow equalization during the wet season. Our collection system will be plastic and tight. With water recycling our peak flows are estimated to be 20,000 gallons per day. During the summer we estimate that the majority of the flow will be used for irrigation. During wet periods, we will discharge into the sanitary sewer system. Flow equalization during wet weather will limit peak flow to about 15 gallons per minute.

The Big Wave Project is located within the Granada Sanitary District. Big Wave would require a single 8 inch connection to a manhole located at the intersection of Airport Street and Stanford Street or a direct connection to the Princeton Pump Station located on West Point Ave, north of Stanford Street. The 8" Stanford Sewer collects from Cornell, Yale and Harvard. This is a lightly loaded 8" sewer and has adequate capacity for the Big Wave flows. Wastewater flows from Princeton, North El Granada and Clipper Ridge to the Princeton Pump Station. The Princeton Pump Station has a 15 inch influent line and an average dry weather flow of _____ and a peak wet weather flow of _____. The Princeton Pump Station currently has a peak capacity of _____ and is (or is not) experiencing peak wet weather overflows. The Pump Station forcemain is six inches and has a peak capacity of _____. The forcemain is (or is not) undersized. El Granada is (or is not) planning Wet Weather flow improvements for _____ (date) with an estimated cost of \$ _____. The forcemain discharges into the Sewer Authority Mid Coastside Forcemain (Montara Sanitary District) across Highway 1 near the intersection of Alcatraz and Sonora Ave. The SAM (Montara) forcemain has (does not have) adequate capacity and is (is not) scheduled for capacity increase. The SAM (Montara) forcemain discharges into the 18 inch gravity line that flows through the "Strip" to the El Granada Pump Station. The El Granada Pump Station has (or does not have) adequate capacity. The El Granada Pump Station receives flow from the southern part of El Granada and Miramar. The Miramar Pump Station is currently being designed to pump sewage to the gravity sewer line to the SAM Plant. This will reduce the flow to the El Granada Pump Station by about 25% and allow the El Granada Pump Station to have adequate capacity for wet weather flows. El Granada Sanitary District contracts the operation of the collection system and pump stations necessary for the collection of sewage and its transmission to Sewer Authority Mid-Coastside (SAM) Treatment Plant. SAM provides wastewater treatment for the El Granada Sanitary District.

Wastewater was collected from El Granada and Miramar in 1920 and discharged in an outfall near the current breakwater. A primary treatment plant was installed in this location in _____ (date).

Prior to 1982, El Granada Sanitary District operated a small primary treatment wastewater plant that collected flow from Princeton, the Airport and the Pillar Point Mobile Home Park and discharged sewage into the Pillar Point Marsh near the Pillar Ridge Mobile Home Park. This plant was decommissioned and the Princeton Pump Station and Pillar Ridge pump station were then constructed.

The Granada Sanitary District 2007/2008 Budget is included in *Appendix 8.1*. Service charges are based on \$314 per Equivalent Residential Unit (ERU) and a connection fee of \$4,700 per ERU. The proposed 2008/2009 budget increase is approximately 12%. The 2007/2008 budget was 12% greater than the 2006/2007 budget. It is assumed that the rate increase for 2009/2010 will also be 12%. A Granada Sanitary ERU equals 211 gallons per day per household. The Wellness Center is 28.5 ERU with estimated connection fees in 2009/2010 equal to \$171,000 and annual service charges equal to \$11,200. The Office Park is 94.8 ERU with a connection fee of \$558,910 and annual service equal to \$37,340. The total in connection fees for both the Office Park and the Wellness Center will equal \$729,910, with an annual fee of \$48,540. It is anticipated that rate increases of 12% will continue. These rates are based on flows without recycling. We anticipate the rates and charges to be based on the final flow estimates and ERU estimate.

Sewer Authority Mid-Coastside (SAM) is the Wastewater Treatment Authority for the Midcoast including Montara, El Granada, Princeton and Half Moon Bay. SAM provides secondary treatment and an ocean discharge at the wastewater treatment plant located west of Highway 1 and north of Highway 92. The plant has an average dry weather capacity of 1.7 million gallons per day (mgd).

Currently there is no wastewater flow being recycled at the SAM facility.

Options for wastewater treatment include the El Granada Sanitary District, onsite treatment and water recycling. Currently, El Granada Sanitary District and SAM do not provide or supply recycled water.

The following measures would have to occur to allow for connection to the El Granada Sanitary District or to allow for onsite treatment:

- If connection to municipal Sanitary District, pay the connection fees for service at the El Granada Sanitary District and obtain a letter authorizing service from this district.
- If water is to be recycled, construct a 25,000 gallon per day water recycling plant and obtain a permit from the Regional Water Quality Control Board and the State Health Department to discharge agriculturally.
- Low flow fixtures approved by SAM and CCWD will be required.

8.2 Water Recycling

Approximately 70% of the water for the Office Buildings will be for toilet flushing, while approximately 30% of the water used in the Wellness Center will be for toilet flushing. Recycled water for toilets will have to be distributed via purple pipes in the building and receive biological treatment and disinfection to be safe, maintenance free and not visually offensive. If the water for toilets is recycled, the domestic demand in the buildings would be reduced by approximately 16,000 gallons per day. The remaining 10,000 gallons per day (mostly shower water in the Wellness Center) can be recycled for agricultural and landscape irrigation. Recycled water is addressed by the Health Department with the same regulations as sewage. Recycled grey water and black water are subject to the same regulations.

Big Wave proposes to use a Membrane Bio-Reactor (MBR) to produce recycled water. The plant will be designed by Enviroquip and initially be sized to treat 0.25 mgd. The system will be sized with two redundant 0.125 mgd process trains. Enviroquip utilizes Kyoto membranes with over 1000 world-wide installations. The system components include screening, biological selection (anoxic zone) with an aeration basin maintaining a mixed liquor of 12,000 ppm and a detention time of about 15 days, aerated membrane filters followed by ultraviolet disinfection. Sludge will either be pressed and hauled to Ox Mountain or discharged into the El Granada Sanitary District Pump Station. The plant will generate about 10 pounds of dry solids per day (50 lbs. of wet solids, or about 450 gallons of 12% solid liquid sludge). Big Wave proposes to discharge the 450 gallons of liquid sludge (consistency of chocolate milk) into the El Granada Sewage System. The proposed MRB system has been certified by the State Health

Department for the production of Title 22 water meeting the unrestricted reuse requirements. A detailed description of the system proposal is provided in *Appendix 8*.

Big Wave would only recycle the sewage that was required for reuse. In the dry periods and growing seasons, Big Wave would reuse all of its water. In the wet season, Big Wave would discharge about 10,000 gallons per day into the El Granada Sanitary District system.

Water recycling at both the Big Wave Office Park and Big Wave Wellness Center will reduce water consumption by up to 16,000 gallons per day and sewage production by the same amount. A number of environmental impacts associated with domestic water and domestic sewage that will be reduced with water recycling as follows:

- Water Recycling will reduce wastewater flows and peak overflows.
- Domestic water is produced by ground water pumping and importation from the Hetch Hetchy System in the Sierras, requiring energy and disinfection with chlorinated compounds.
- Ground water pumping along the Pilarcitos Creek Channel has effectively eliminated the habitat for the threatened native Steelhead and California Red Legged Frog. Both species are key indicators of biodiversity. Reduction in the demand for domestic water will improve the chances of habitat restoration and species recovery.
- Domestic water is disinfected with chlorine. Chlorinated organic compounds have been shown to be bio-accumulators, causing cancer and altering the reproduction behavior of fish and other native species. Domestic water produces approximately 300 pounds of chlorinated hydrocarbons each year.
- The majority of the domestic water produced is generated from the Tuolumne River Valley. Before the Tuolumne River Valley was filled to provide water for the city of San Francisco and San Mateo County, this valley was equal to the adjacent Yosemite Valley in grandeur and pristine wild and scenic river habitat. The Tuolumne River Valley will never be restored without a comprehensive water policy that includes recycling water.
- Exportation of water to Half Moon Bay and the rest the Peninsula has contributed to threatening the salmon and migratory fish population in the Delta along with resident fish such as the Delta Smelt. Water exports cause the Mokolumne River and the Consumes River to flow backwards during the summer, resulting in increased salinity and other negative outcomes that affect critical fish habitat.
- Domestic water requires energy to produce. Roughly 50% of the energy used produces greenhouse gases and other pollutants. Water treatment requires approximately 0.005 hp/gal of water. For 26,000 gallons per day (gpd), approximately 30,000 pounds of greenhouse gases and pollutants will be generated per year.
- Domestic wastewater treatment is disinfected with chlorine at dosages of 5 times that for water treatment, producing approximately 1,500 pounds of chlorinated organic chemicals per year.
- Wastewater treatment requires approximately twice the energy needed for water treatment. Wastewater treatment at Big Wave would produce 60,000 pounds of greenhouse gases.

Since the regulatory requirements to recycle water are high and the potential for individual and environmental contact with the recycled water is also high, the following mitigation measure would have to be met in order for Big Wave to use recycled water:

- If water is recycled, it would have to comply with the State Health requirements for unrestricted water reuse, listed in Title 22 (2.2 coliform per 100 ml and 2 NTU turbidity units). This would require treatment processes approved by State Health Department and effluent and operational criteria approved by the State Regional Water Quality Board. State Certified operators for the water recycling plant would be required.

8.3 Ground Water Recharge System

The Ground Water Recharge System will function as the Storm Water Control System and is designed to capture and treat 80% of the surface water runoff. It is also designed to recharge the ground water basin at a level that exceeds the project's ground water groundwater demand for irrigation.

To maximize ground water recharge, surface water runoff must be minimized. This is also required by the San Mateo County Water Pollution Prevention Program (SMCWPPP) as described in provision C.3.c.i.3. To minimize hard surface runoff, all roof water will be collected and treated in a rainwater garden infiltration system (as described in the Project Description and in *Appendix 4.4*). These systems constructed on granular soil will allow approximately 50% of the rainwater to infiltrate and 30% of the rainwater to dissipate through evapotranspiration. The permeable concrete walkways and parking lots will infiltrate 80% of the rainwater. The system is designed for infiltration rates of 0.5 inches of rain per hour. The concrete design incorporates a 6inch course gravel layer that can store can store approximately three inches of rain. The system can store and treat a sustained rain of three inches for four hours in duration. This capacity exceeds a ten year event. Any rain intensity exceeding this amount will be collected and discharged into constructed wetlands for biological treatment and sediment removal. Porous concrete specifications are attached in *Appendix 8.3*. Both parking lot infiltration and rain water gardens provide good bacterial and nutrient removal. Slow infiltration below parking lots maintains an active population of bacteria that provide biological decomposition of oil and organic dirt. This soil culture also provides an extremely competitive environment that does not allow pathogenic organisms to survive in more than the top few feet of soil.

Big Wave's Storm Water System Maintenance System Plan includes the following features:

- Monthly inspection of all components. Big Wave will train a crew from the Wellness Center to maintain the storm drainage system;
- Annual weeding (exotic plant removal) and hand shoveling silt, trash and debris from the restored wetlands, biological treatment ponds and rainwater gardens;
- Annual replanting the Rainwater Gardens and restored wetlands with native wetlands plants;
- Bi-annual (twice per year, spring and fall) cleaning of storm drain catch basins;
- Bi-monthly (twice perm month) vacuuming the parking lot with a high vacuum machine to remove silt and debris from the permeable concrete (Big Wave will purchase the machine and train the operators); and
- Daily trash pickup in the parking lots.

The irrigation systems will be designed for landscaping and agricultural irrigation and will supply the majority of the water for plant growth, while resulting in minimum runoff and infiltration. The irrigation techniques for the restored wetlands and the farm production will minimize ground saturation and maximize evapotranspiration. Since the agricultural soils have low permeability, it is assumed that there will be no runoff and that 95% of the irrigation water will evaporate (with only 5% to recharge the groundwater). The total area under irrigation will be about 25 acres (including the leased area to the east of Airport Street). The average volume of irrigation will be 10,000 gallons of water per day. Assuming 5% infiltration rates, the volume infiltrated from agricultural irrigation will be approximately 200,000 gallons of water per year.

The average rainfall in the area is approximately 25 inches per year. The project will have approximately three acres of roof top area and seven acres of permeable parking lots and walkways that are designed for ground water infiltration. The remaining nine acres will be restored wetlands and native plant landscaped areas. The estimated groundwater recharge from the roof treatment system and the permeable concrete hard surfaces will be approximately 1,000,000 gallons per year (or about 2700 gallons per day) for the roof water and approximately 3,200,000 gallons per year (or about 9,000 gallons per day)

for the permeable hard surfaces. As long as the pumped amount from the agricultural well does not exceed the infiltration amount, the safe yield for the Pillar Point Marsh aquifer will not be impacted.

Drip irrigation will be used for landscaping and trees. Spray irrigation will be used for row crops and the wetlands restoration.

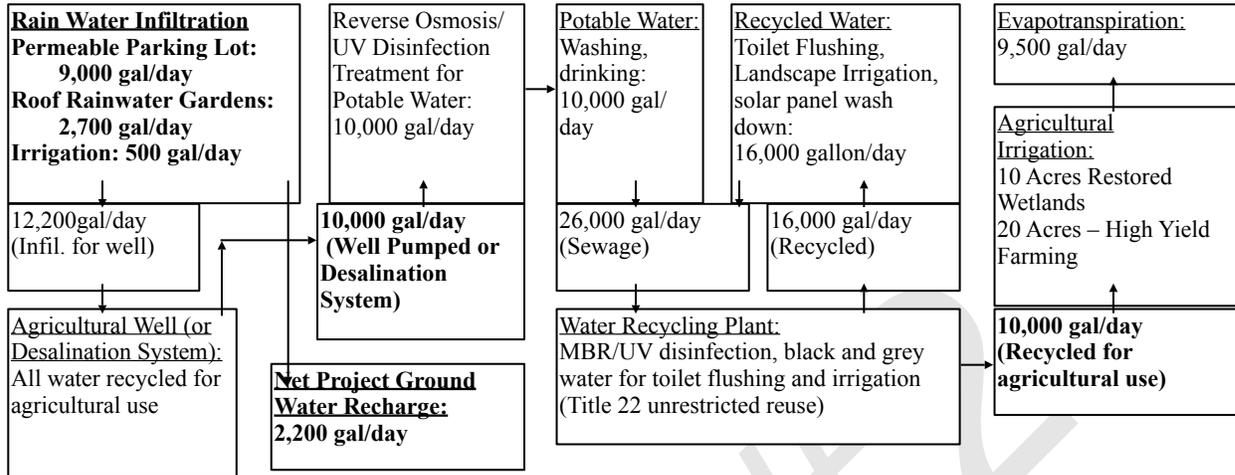
The following mitigation measures are required to meet the County NPDES Standards C.3 for runoff and protection of the Pillar Point Marsh aquifer are:

- For continued well pumping and compliance with SMCWPPP Provision C.3, all roof water runoff will be treated in rain garden infiltration systems that will capture 80% of the first flush and 80% of the annual rainfall.
- For continued well pumping and compliance with SMCWPPP Provision C.3, all hard surfaces will be constructed with permeable concrete that will capture and infiltrate 80% of first flush and 80% of annual rainfall.
- To protect the safe yield of the Pillar Point Marsh aquifer, groundwater utilized domestically and groundwater to be used for irrigation will not exceed the designed infiltration amount for project infiltration systems.
- The Storm Water Control System will be maintained in accordance with the Maintenance plan approved by the County.

The water balance on the next page (*Figure 8.3*) illustrates how the infiltration system provides a net increase of 2,200 gallons per day in the ground water recharge of the Pillar Point Marsh aquifer. Two options are shown, one for water recycling and one without water recycling. Both alternatives provide groundwater and provide increased farming production over the non-project alternative.

Figure 8.3 Water Balance

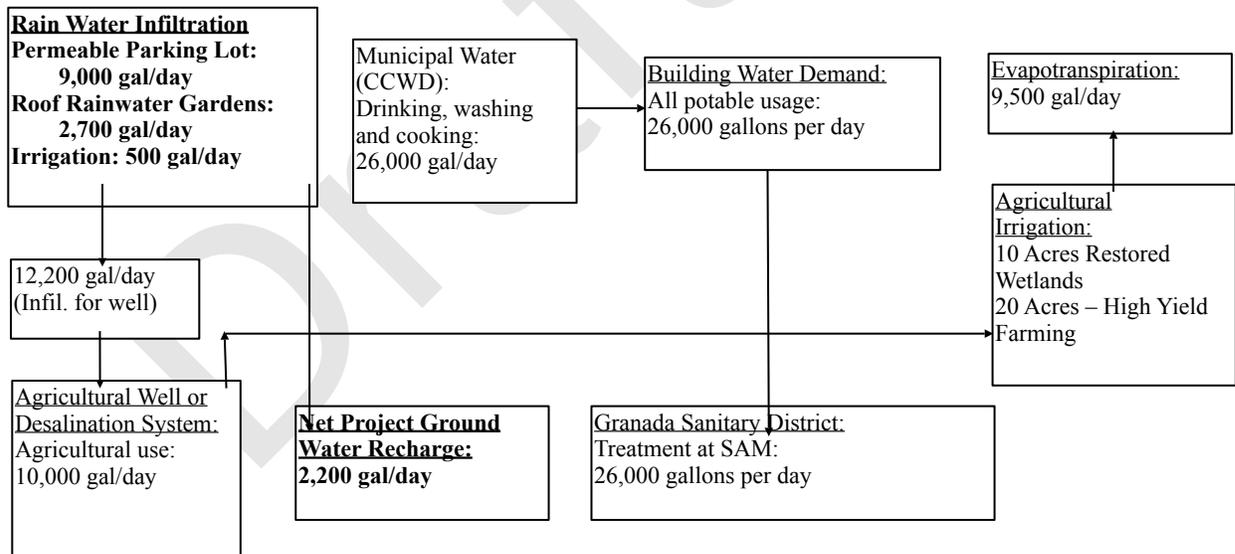
Option 1: Water Recycling: Agricultural Well, Recycled Through Buildings (Potable and Toilets)



Notes (Option 1):

1. The project has a net increase in groundwater recharge of 2,300 gal/day due to the design of the infiltration systems.
2. Develops high yield farming
3. Reduces Domestic Water Consumption by 26,000 gallons per day, reducing the municipal impacts of ground water pumping and importing water from the Sierras (negative impacts to streams, rivers and Delta fish)
4. Reduces sewage production and negative ocean impacts.

Option 2: No Water Recycling: Municipal Water (CCWD), Municipal Sewage Treatment (GSD), Agricultural Well



Notes (Option 2):

1. The project has a net increase in groundwater recharge of 2,300 gal/day due to the design of the infiltration systems.
2. Develops high yield farming

8.4 Municipal Water

Agricultural and landscape water consumption by Big Wave is estimated to be an average 10,000 gallons per day (gpd) at a peak of 20,000 gpd during the peak summer usage. This amount could be reduced with more effective types of irrigation and careful irrigation techniques. Domestic usage will be approximately 20,000 gallons per day (28 hcf/day) for the Office Park (18 gpm average) or about 5,000 gallons per day (seven hcf/day) per building. Peak domestic usage is estimated to be 100 gallons per minute (gpm). Peak fire flow is estimated to be 2,000 gpm and total fire flow is estimated to be 90,000 gallons. All ornamental landscaping is planned to consist of native plants that will require initial drip irrigation but will be selected to function in the coastal environment without continued irrigation. Ornamental landscaping will initially utilize 0.1 acre feet of water per year. The farming operation will use approximately 0.5 acre feet of water per acre per growing season. If the 20 acres are irrigated for row crops, the total agricultural water will be approximately 10 acre feet of water (or about an average of 10,000 gpd). The irrigation amount will be reduced to only recycled water during dry years and will be subsidized with well water. The restored coastal wetlands will be irrigated for approximately three years (using approximately two acre feet of water) until it matures.

Domestic water is required for the Office Park and the Wellness Center. Big Wave is not within the district boundaries of a domestic water supplier. Options for domestic water include domestic water supplied from the Montara Sanitary District (MSD), domestic water supplied from Coastside County Water District (CCWD) or the generation of water onsite. CCWD rates and service requirements are available in *Appendix 8.4*. Montara Sanitary District has a supply capacity of 0.51 million gallons per day during a normal year and 0.36 million gallons per day during drought years. The build out demand for Montara water is 1.72 million gallons per day. Montara Sanitary District has a moratorium against the issuance of water connections. CCWD obtains water from the City of San Francisco's Crystal Springs Reservoir and from domestic wells. CCWD has a supply capacity of 1.13 mgd during normal years and 0.79 million gallons per day during drought years. CCWD has a build out demand of 1.24 mgd and will only issue water connections to priority users and users with Phase 1 Connection Permits. Water is currently being sold by the city of San Francisco to CCWD for \$500 per acre foot. Due to major infrastructure repairs, it is anticipated that the cost of water from San Francisco will be raised by 400% in the next five years. Montara Sanitary District obtains their water from local wells. The nearest Montara Sanitary District well is located in the Half Moon Bay Airport, near Highway 1 and the 3-0 Cafe. Onsite water would come from treated well water from the Big Wave well.

Water for fire flow will be obtained from CCWD, MSD or from water generated onsite. The fire water suppression system will be designed by a licensed Fire Suppression Engineer. The distribution system will most likely be an eight inch main at 150 psi, capable of delivering 2,000 gallons of water per minute (at a minimum pressure of 30 psi for 30 minutes). The CCWD main (located at Stanford and Airport Street) is capable of delivering this aforementioned flow. MSD does not have the system capabilities to provide this needed flow. Onsite fire protection would require a 60,000 gallon to 90,000 gallon storage tank and a pressure booster system. A deep swimming pool (measuring 30 feet x 100 feet x 4 feet) would adequately store 90,000 gallons.

There will be six water distribution systems for Big Wave. The domestic water supply will be a four inch waterline distribution system. This system shall distribute water from the Water Districts or distribute treated site water for potable use. Agricultural well water will be distributed in a six inch waterline for irrigation and/or toilet flushing. Recycled water will be distributed in a six inch waterline for agricultural irrigation and toilet flushing. Fire flow will be distributed in an eight inch waterline. Back flow preventers will be provided for all District connections.

The potable water system for each building in the Office Park (and the cluster of buildings in the Wellness Center) shall be fed by a 1/2 inch metered waterline to a hydro-pneumatic tank (sized to provide adequate flow to the building through a four inch waterline distribution system). This hydro-pneumatic tank will minimize to potable flow requirements to reduce the meter sizes or reduce the size of the water

treatment facilities. The hydro-pneumatic tanks will receive a steady flow rate (typically five gpm) and discharge flow rates up to 100 gpm, depending on the demand. The Office Park will require five, 1/2 inch water meters (one meter for each of the four buildings). The Wellness Center will require two, 1/2 inch meters for the apartment building and two, 1/2 inch meters for the Breezeway clusters.

To obtain Municipal water, the following steps will be required:

- Water supplied from Montara would require the end of their moratorium. Montara would also require major infrastructure improvements to provide fire service (a service that will most likely be unfeasible).
- Water supplied from CCWD would require the priority water service approval for low income housing and commercial. Infrastructure improvements would not be required for CCWD.
- The Big Wave EIR would have to satisfy the LAFCO District Boundary Adjustment CEQA requirements.

If connection to municipal water is desired, CCWD is the only option. The connection cost for 2007/2008 would be approximately \$480,000. The annual 2007/2008 water cost would be approximately \$75,000 per year. The rate increase for 2008/2009 was 11%. It is anticipated that the rate increase for 2009/2010 will also be 11%. The connection fee for 2009/2010 is estimated to be \$602,000 with an annual service fee of \$94,080. It is anticipated that the annual service cost will double within the next five years due to the need to overhaul the Hetch Hetchy water system and due to the general lack of water within the State of California.

8.5 Onsite Water System

Big Wave currently operates an agricultural well and will continue to do so regardless of the project alternatives selected. The agricultural well will continue to supply water for the ongoing agricultural operations. Depending on the alternative selected, the well will supply water for the native plant nursery, the wetlands restoration and the startup ornamental landscaping. The well may also provide toilet flushing water prior to reclamation and agricultural reuse. The agricultural well has a safe yield of 30 to 60 gpm. This well was installed in 1985 to drinking water standards and is approximately 150 feet deep with screens at 50 to 70 feet.

Utilizing this well domestically would require a Coastal Permit and compliance with County and State Public Health Standards. The Coastal Commission would require the protection of the Pillar Point Marsh aquifer. Protection of the aquifer yield would require that the recharge meets or exceeds the amount pumped from the aquifer. The ground water recharge system can and will be designed for 4,000,000 gallons per year or an average of 12,700 gallons per day. Withdrawal of up to this amount would be the safe (or balanced) environmental (sustainable) daily yield for the Big Wave well. With recycling for toilets, the domestic use drinking water, washing and cooking will be about 10,000 gallons per day. This domestic water can completely recycled for agricultural or wetland restoration. If this alternative is selected it will be a perfect sustainable water balance (as shown in *Figure 8.3*). All water pumped from the ground will be used, recycled (providing irrigation for food crops) and then returned into the ground with no net loss (actually a net gain of 2,200 gallons per day).

The County Environmental Services Department would ensure that the agricultural use continues. In other words, any water domestically used would have to be completely reused agriculturally. The average agricultural use will be 10,000 to 20,000 gallons per day. 10,000 gallons of domestic water will be recycled for agricultural use.

The State Public Health Department will require disinfection of water and possibly treatment of water with reverse osmosis.

To utilize the existing well for domestic use, the following mitigations will be required:

- Ground water recharge shall exceed groundwater extraction. For the Big Wave Project, ground water recharge shall exceed 12,700 gallons per day and ground water extraction shall be less than 10,000 gallons per day.
- Recycled water shall be used in toilets, agricultural and wetlands restoration.
- For the Big Wave well to continue to be considered an agricultural well, agricultural and wetlands restoration demand must exceed the 100% recycled domestic volume of domestic water.
- The water recycling system and the water treatment system shall be approved by the County Environmental Services, the State Regional Board and the State Health Department.
- The safe hydraulic yield of the well cannot be exceeded. An on demand hydro-pneumatic system will be required to meet the peak domestic flow for each building.

The two onsite sources of water are the Big Wave Well and sea water from Princeton Harbor. Sea water would require pretreatment, reverse osmosis (RO) and disinfection with ultraviolet light. The RO system will be designed based on the Santa Cruz/Soquel Water District Desalination Study (2008). The proposed reverse osmosis/ultra-violet light disinfection portable water treatment system is described in *Appendix 8.5*. The basic process is as follows:

Desalination will utilize the existing salt water intake on the Princeton pier. Two, two inch pipes will extend in the unpaved east on Ocean Blvd to Vassar and North on Vassar to Airport Street. The lines will be installed in the west shoulder of Airport Street and enter the project at Airport Street. The Desalination ("Desal") unit will be located in one of the Storage Maintenance rooms on the first floor of the Wellness Center. The pipes will be installed in the unpaved sections of County Roads with an encroachment permit. The intake flow will be 20 gallons per minute and the return flow will be 10 gallons per minute. Intake salt content will be 36,000 ppm and return will 50,000 ppm. This flow is so small that there will be no impacts associated with the intake or discharge. Pre-treatment will be slow sand filters with a loading rate of 0.1 gallons per square foot. To limit boron in the effluent, the RO flux rate will be 12 gallons/sq. ft per day. Through put water will be 150 ppm salt. Disinfection will be UV. This is the exact system being studied by CDM for the Santa Cruz Desal system. It is the same size as the system that was recently permitted by the Coastal Commission for the Hotel on Cannery Row in Monterey. It is proven, approved and permitted technology.

The technical feasibility of the Big Wave Desalination system, including the biological impacts, is analyzed in *Appendix 8*.

The impacts associated with desalination are as follows:

- A. The pipelines will be in public streets with encroachment permits;
- B. The primary impacts are associated with the intake screen;
- C. Membrane clogging without pretreatment (the ocean is a very dynamic biological system with red tide algal growth and a wide swing of sedimentary conditions);
- D. Biological growth in the feed piping;
- E. Meeting drinking water standards from ocean water (the only problem with meeting the California Drinking Water Standards has been occasionally exceeding the limit on Boron);
- F. RO water can be corrosive; and
- G. The brine discharge can increase the salinity of the receiving water (this can be a problem if the brine return is put into a sewer system where the water is being recycled or if the volume of brine return is large and has potential biological impacts to the receiving water).

The mitigations required for the desalination impacts are as follows (lettered mitigations correlate with lettered impacts above):

- Encroachments and easements will be required for the intake and brine return.
- The intake screen will be designed for low velocity so as not to trap small fish and have sufficient opening so as to not clog with marine growth.
- Big Wave will design sand filters have been very effective systems for pre-treating influent.
- UV treatment before RO has been effective to control growth in the pipeline.
- This can be addressed by running a higher flux rate over the RO).
- Corrosive water is addressed by adding softer salts into the drinking water.
- The Big Wave brine will be retuned and discharged at a lower level than the intake in more or less the same location as the intake. The volume of the brine water (12 gallons per minute) is so small relative to the tidal action of the harbor (700,000 gallons per minute) that the impacts to the bay will be undetectable and un-measurable. The concentration of the brine is only 30% greater (50,000 ppm versus 36,000 ppm). The brine return will be a peak increase of 1.5 pounds of salt per minute into a 210,000 pound per minute tidal flow. The increase in salinity will be less than 0.0007%. Given all of the salinity variation components in the bay, this is un-measurable.

Onsite fire protection utilizes the swimming pool for fire flow storage. The pool is sized to provide 45 minutes of fire flow at 2,000 gallons per minute. Booster pumps in a pump well located in the parking lot and directly powered from the emergency generator panel transfer switch will be designed to provide the flow. This system can provide either primary or secondary fire flow.

8.6 Electrical Utilities

Electrical power to the site is provided by PG&E. Currently, power is fed through a 12 kilovolts (kV) line that passes through the site. The project proposes to relocate and underground the power lines to the east side of the site, as shown in the Site Plan in *Figure 1.1.1 and Figure 1.3.1*. The underground power would originate at the pole line located on the east end of Stanford Street and continue to the pole line located on the south property line of the mobile home park.

It is estimated that the average power demand for the Wellness Center will be 80,000 kW-hrs per year with a peak month of 20,000 kW-hrs per month, a peak usage of 650 kW-hrs per day and a peak power demand of 75 kW. It is estimated that the average power demand for the Office Park will be 650,000 kW-hrs per year with a peak month of 100,000 kW-hrs per month, a peak usage of 5000 kW-hrs per day and a peak power demand of 500 kW. This estimate assumes that Big Wave Office Park will provide incubator servers for high tech office facilities.

Based on the PG&E's Low Voltage Rate Table A-10 for Medium General Demand Metered Service, the annual rates for the Wellness Center will be approximately \$16,000 and the annual rates for the Office Park will be about \$150,000. For both Big Wave properties (the Office Park and Wellness Center), the annual electrical power cost will be approximately \$166,000.

Big Wave intends to provide standby power generation (via a backup emergency generator) for the whole complex. Big Wave also intends to provide solar and wind power for the whole complex. Standby power will lend itself to a single metered connection with PG&E with a single transfer switch. However, multiple generators, transfer switches and metered connections can be considered. For example, a separate metered connection could be provided for the Wellness Center with or without standby power, while a separate metered connection could be provided for the Office Park with standby power. The option to provide individual metered connections without standby power for each Office Park owner should also be considered. This individual metering would allow each owner to pay PG&E directly without the benefit of standby power, solar or wind power. Standby power will be operated by biodiesel engines, designed for cogeneration and peak shaving.

Solar and wind power systems will be installed throughout the private grid. Currently, it is most cost effective to utilize solar and wind power to reduce the electrical load and avoid selling power back to PG&E. Details of the proposed solar system are attached in *Appendix 8.6.1*. The cost and sales price of the power will be greatest during peak usage time (up to 10 times higher than off peak prices) and lowest during off peak times. Alternative power could reduce the annual cost of power to zero. Currently, the PUC does not require PG&E to buy excess power that exceed the annual usage costs. The solar and wind power would be owned by Big Wave Wellness Center. For a large, alternative power system, a single metered connection will be the most cost effective. It is estimated that the cost of power will double in the next ten years.

The power connection and transformer will be located adjacent to the Utility Communications Building, on the south east corner of the Office Park. At this point, the power will be transformed to 480 three phase or 240 three phase and distributed to the site. For separate metering, power will be distributed in conduits installed by Big Wave and owned by PG&E to the different metering points (i.e. Wellness Center and each commercial owner). PG&E will own the meters. For a single metered connection, power will be distributed in conduits owned and installed by Big Wave and Big Wave Wellness Center will own the separate meters for the different power users. The electrical distribution infrastructure is essentially the same for the system owned by Big Waver and for the system owned by PG&E.

Big Wave will provide fuel cells for the DC communications backup (examples in *Appendix 8.6.2*). If inexpensive and safe methods of hydrogen generation can be identified for off peak production, Big Wave will provide hydrogen generation and peak shaving with larger fuel cells.

8.7 Communications

Telephone to be provided by Pacific Bell, Internet to be provided by AT&T and cable to be provided by Comcast will be available in an underground system installed in Airport Street. These systems will connect to the Communications Building, which will be located on the southeast corner of the Office Park site.

Big Wave Communications will leverage a high capacity, redundant and renewable energy-powered telecom link to provide significant internet and data transmission capabilities to the Office Park and Wellness Center. This telecom link will connect to two microwave dishes located on the east face of the Communications Building. Big Wave Communications will hardwire all communication links to each building in the Wellness Center and the Office Park through a private communications duct bank. All offices and residences will have the option of hardwire phone, hardwire cable and internet. Big Wave Communications will also offer Wi-Fi for the residences and offices.

The proposed Big Wave telecommunications link is a wireless based link that will connect the Big Wave development with the greater bay-area internet exchanges and overall global internet. This link could serve as either a primary service or a back-up service to the fiber optic facility that enters the market via shared paths.

Key features:

- An aggregate of over 350 hundred megabits of Tier 1 internet access
- Carrier class link with full redundancy to the current telephone company service offering
- Operates in FCC licensed space
- Total facility consumes very little energy (10A continuous maximum)
- The link will be 65% powered (2 of the 3 hops) by solar and wind energy. Remaining pieces of the link will consume small amounts of energy and will use shared HVAC and power where possible.

- The link will be fully managed and monitored 24 hours a day, 7 days a week, 365 days a year.
- The link will be capable of delivery of voice, data transmission and internet services.
- The link could act as back-up link for PCS/Cell provider backhaul and for local/regional broadcasters.
- The link facility and its point of presence at the development will have redundant power and redundant control and data systems.

The link will enter the development site at the predefined telecom space where it will be interconnected to building data wiring. From this telecom point of presence, internet and voice services will be delivered.

This link can be leveraged by other Half Moon Bay or Princeton area businesses and organizations. Since this link is a complete bypass of the local telecom systems, it provides excellent disaster recovery capabilities.

The microwave dishes will be integrated into the wall of the Big Wave Communications Building and will not extend beyond five feet of the building's roofline. The design for the Big Wave Communications Building is illustrated back in Chapter 1, in *Figure 1.3.9*.

8.8 Solid Waste

Allied Waste will provide solid waste collection and recycling. Big Wave will provide spaces for debris boxes and commercial recycling in the Office Park parking lot (as shown on the site plan) and in each building. We will provide trash and recycling chutes in the Wellness Center and a central pickup located in the parking lot, as shown on the site plan.

Big Wave Recycling will provide education services, organic composting services and metal recycling services. Food waste and clean paper waste will be recycled for a farm soil supplement. The education program will assist building maintenance and the commercial tenants to minimize packaging and waste. To ensure that the project meets the provisions of AB 939, Big Wave Recycling will recycle a minimum of 50% of its solid waste, with a goal to recycle 95% of its solid waste.

9.0 Hazardous Material

9.1 Phase 1 Environmental Site Assessment

A Phase I Environmental Site Assessment (ESA) was prepared by Treadwell and Rollo and is included in *Appendix 9.1*. The report revealed only one environmental condition at the site: the possible application of pesticides to the soil during farming dating back to 1930. There have been no other known uses for the site other than agricultural (as shown in the historical photographs included in *Appendix 9.2*). Other environmental concerns that do not qualify as a recognized environmental condition include:

- Possible non-source pollutants from the airport and Airport Street drainage ditches;
- Solvents in the groundwater from properties north of the site;
- Possible illegal dumping on the site; and
- Possible groundwater contamination of hazardous or petroleum products from the airport.

The ESA report recommends a Phase II Assessment that is designed to test the surface soils for pesticides. The report also recommends additional testing of the agricultural well for the presence of groundwater pollution.

The drainage ditches from the Half Moon Bay Airport and Airport Street are on County property and do not directly impact the area of proposed development. Some of the drainage from these structures flows onto the western portion of the Wellness Center site and forms the Federal Wetlands. The Big Wave developers cannot grade this portion of the site, but the wetlands restoration plans include dense planting that is designed to remove the pollutants from water prior to its re-entrance to the County-owned Pillar Point Marsh.

Solvents have been identified in well water samples at the Yu Property (890 Airport Street), approximately 900 feet north of the project site. The historic use of the Yu property for candle making and automotive parts cleaning is most likely the source of the solvents in the ground water. Ground was sampled from the two domestic wells on the Yu property from 1994 through 2003 and has shown a steady decline of TCE and PCE concentrations to fall within the legal limits for drinking water. Well water samples in the mobile home park (400 feet north of the project site) showed only one detected TCE concentration in the 1997 sample and have no detections since then. Based on non-detection in the mobile home park well, it is the opinion of Mr. Greg Smith (Program Specialist for the San Mateo County Health Department) that solvents have not migrated south into the project site.

Potential groundwater contamination from the airport has not been detected in samples. The ESA identifies the closest abandoned underground storage tank as 500 feet to the southeast of the project located near Denniston Creek. The other abandoned underground storage tanks are located more than 2,000 feet to the east. If there is groundwater pollution associated with the past fuel and chemical storage at the airport, the lack of presence in the site ground water indicates that the Denniston creek watershed may be the recipient of this pollution.

The Big Wave Project currently utilizes its well water for agricultural irrigation. If water from the well is considered for domestic use it will be treated with reverse osmosis (RO) and ultraviolet disinfection (UV). RO removes salts, dissolved metal, organic chemicals and other known groundwater pollutants. UV disinfection is an accepted method of disinfection for bacteria and viruses.

It should be noted that the presence of contaminated surface water and groundwater and contaminated soils have not be detected. To render the impacts associated with potential surface soil contamination from pesticides and illegal dumping, potential ground water pollution from solvents,

abandoned underground fuel tanks at the airport, and potential surface water pollution from the airport and Airport Street drainage, the following mitigations will be adopted:

- A Phase II ESA will be completed and focused on testing the soil for pesticide pollution.
- Surface soil will be tested according to the ASTM standards for Phase II ESA and if contaminated soil is found, it will be handled in a manner acceptable to the County Department of Public Health.
- All ground water will be utilized for landscape and agricultural applications. Ground water will be tested quarterly for contamination. Only ground water that meets public health standards will be utilized for landscape irrigation when there is the potential for human contact. If ground water is to be utilized for domestic use, it will receive adequate treatment approved by the County and State Health Department.

9.2 Phase II Environmental Site Assessment

Big Wave will perform a Phase II ESA in accordance with ASTM standards. To minimize project runoff, the Big Wave Project intends to utilize porous concrete for all walkways and parking lots. For the porous concrete to work, soil permeability must be at least 0.5 inches per hour. The majority of the surface soils are organic clayey silts with low levels of permeability and high levels of expansion. These surface soils are ideal for the proposed wetlands restoration but will not function for the parking lot and building foundations. The Big Wave Project proposes to remove the surface soils from the parking lot and rain water infiltration areas and replace it with the granular subsurface soils mined from other areas on site. During this process all of the surface soils will be tested in accordance to the ASTM Standard Practice for Environmental Assessment and with the County Health Requirements. Any soils deemed contaminated will be treated onsite or removed from the site if necessary. All surface soils, due to their high organic concentrations, will be utilized in the restored wetlands and landscaped areas on the site.

9.3 Storm Water Pollution Prevention Program

To minimize storm water pollution associated with the project, the County requires that Big Wave prepare a projected Storm Water Pollution Prevention Program (SWPPP) that incorporates design measures that will include: protection of sensitive biological areas with minimal changes to the natural topography; minimization of impervious surface; minimization of impervious areas connected to the storm drains; maximization of permeability by preserving open space; use of permeable pavement for parking and walkways; use of landscaping to treat storm water; and use of native plants for all landscaping.

To ensure that storm water pollution will not cause a significant impact, the following mitigation is included:

- Prepare a SMCWPPP that incorporates design measures that will include:
 - Protection of sensitive biological areas with minimal changes to the natural topography;
 - Minimization of impervious surface; minimization of impervious areas connected to the storm drains;
 - Maximization of permeability by preserving open space;
 - Use of permeable pavement for parking and walkways;
 - Use of landscaping to treat storm water; and
 - Use of native plants for all landscaping.

9.4 Construction Pollution Prevention Program

The project must comply with the San Mateo County Storm Water Pollution Prevention Program (SMCSWPPP) specifically for Provision C.3 during construction. The project will require an NPDES permit from the State Regional Water Quality Control Board.

The following construction mitigation measures will be followed to insure that the impacts are less than significant:

- During site grading, all of the surface soils will be tested in accordance to the ASTM Standard Practice for Environmental Assessment and with the County Health Requirements. Any soils deemed contaminated will be treated onsite or removed from the site if necessary. All surface soils due to their high organic concentrations will be utilized in the restored wetlands and landscaped areas on the site.
- Obtain SMCWPPP permit for construction with Construction BMPs for handling and storage of construction materials and waste; control and prevent discharge of all potential pollutants; park equipment in a contained area for cleaning and fueling; install siltation fencing and straw waddles prior to grading; contain concrete waste; delineate of sensitive habitat to be protected; protect adjacent properties with sediment barriers; clear grading in dry weather; and double contain all construction fuel on the site.
- All motorized equipment will have OSHA approved silencers. All engines will meet current Air Quality Control Standards.
- The County's noise control standards will be met and the County's required hours of operation will be followed.
- No grading will occur during the wet weather season.
- Sweep Airport Street daily with wet sweepers if visible soil material is carried onto the street.
- Obtain an NPDES Storm Water Permit from the Regional Board prior to construction.

Construction will incorporate LEED certified construction in the following areas:

- Permanent Backup Power is designed operated on natural gas and biodiesel. Biodiesel (as opposed to petro-diesel) is a vegetable oil that is non hazardous. Fuel cells are natural gas-powered molten carbonate without hydrogen storage.
- Radio transmission is isolated from the Office Park and sends and receives signal over the Half Moon Bay Airport, focused on Montara Mountain. There will be no potential for intersection of the beams or scatter.
- Recycle over 50% of the construction waste, ultimate goal is 75%.
- Use recycled materials to construct buildings: at least 1% with a goal of 20%. Crushed recycled concrete for base rock is approximately 20%.
- Use 20% locally processed and produced materials (possible with concrete tilt-up buildings)
- Use only low emitting materials. Adhesives and sealants will be avoided.
- Implement an Indoor Air Quality management plan during construction.
- Minimize use of high emitting paint, carpets, and composite wood or fiber.
- Design buildings to incorporate chemical and pollutant source control.

10.0 Air Quality

10.1 Air Quality

The long term air quality improvements are listed as follows:

The project will reduce traffic along Highway 1 and Highway 92. The project goal is to employ more than 500 local residents that normally commute to San Francisco or urban San Mateo County. The project provides a reverse direction commute for most of these residents. The amount of CO₂ (greenhouse gas) produced by a single car is approximately 2 lbs/hour at 50 mph and 1 lbs/hour idling. The amount of organic particulates (smog and cancer producing material) is about 0.5 lbs/hour at 50 mph and 0.2 lbs/hours idling. The amount of NO_x (smog producing material) is 10 lbs/hour at 50 mph and 5 lbs/hour idling. Assuming the average commuter drives for 30 miles and idles for 30 minutes, the total amount of pollutants reduced (by reducing commute distance) per day per car by the proposed Office Park is estimated to be 2.2 lbs of CO₂ per car per day, 0.3 lbs of organic pollutants per car per day, and 8 lbs per car per day of NO_x. The estimated reduction resulting from the reverse commute is 112 tons per year of CO₂, 15 tons per year of organic pollution and 410 tons per year of NO_x (assuming 200 commute days per year).

The project is designed to be Gold or Platinum LEED (Leadership in Environmental and Energy Design by the US Green Building Council) certified. LEED certified materials are rated by their low level of energy requirements for production and their low level of volatile organic chemicals. This is primarily due to the lack of the use of synthetics and plastics. It is estimated that the project will avoid the use of roughly 160 tons of plastic and synthetics due to its LEED certification. This correlates to a one-time reduction of green gas production by avoiding oxidation of plastic materials over time: 380 tons or about a ten ton per year reduction in greenhouse gas. The reduction of organic chemicals that would ultimately get into the atmosphere will be about three tons per year.

The project includes the restoration of a wetlands that involves the planting of about 20,000 trees. At maturity, these 20,000 trees will convert approximately 20 pounds of CO₂ per year. This will result in a reduction of greenhouse gas equal to 200 tons per year.

The project may generate all of its electrical energy with solar power and wind power. The average generation is about 150 kilowatts per hour and the consumption is about 3,600 kW-hr per day. Conservatively, assuming half of the power produced by the utilities is from gas-fired or oil-fired plants and half by renewable energy, greenhouse gases are reduced about 20 tons per year and about 60 tons of NO_x per year. The project may generate all of its heating energy through solar power reducing about 20 tons of CO₂ per year and about 60 tons of NO_x per year. The project may generate all of its cooling power through geothermal power, which will also reduce about 20 tons of CO₂ and 60 tons of NO_x per year.

The project may generate a surplus of locally produced food, eliminating the cost and fuel consumption of delivery. Approximately 700 40-mile trips per year will be eliminated equaling about 3 tons per year of CO₂ and about 9 tons per year of NO_x.

The project will emphasize and encourage alternative transportation including additional transit, bike trails, shuttle service and parking regulation.

The total reduction in CO₂ resulting from this project is approximately 385 tons per year. The total reduction in organic particulate cancer-causing pollution resulting from this project will be approximately 20 tons per year and the total reduction in smog-forming NO_x will be approximately 500 tons per year.

To ensure that the project development air quality impacts are less than significant, the following mitigations will be adopted to reduce air pollution:

- Reduce traffic along Highway 1 and Highway 92.
- Focus the design on techniques and materials that reduce air and water pollution as described in the US Design and Building Council LEED.
- Maximize CO₂ uptake with landscaping.
- Maximize onsite energy management and energy production.
- Emphasize alternative transportation.

10.2 Construction Air Quality

There will be one-time construction noise, production of greenhouse gas, particulate pollution and dust during construction. There is also the potential for oil and chemical spills in the environment. This will be mitigated by best management practices for construction activities, including:

- Installing silt fencing and straw wattles;
- Directing drainage to siltation ponds and siltation filtration bags;
- Limiting grading activities to dry weather conditions. Control dust truck spray with recycled water;
- Implementing the County approved dust control plan;
- Parking all construction equipment in designated contained areas where runoff is strictly contained and monitored;
- Establishing all erosion and pollution controls prior to beginning grading operations;
- Placing concrete waste in plastic lined pits with set debris to be hauled offsite and recycled;
- Recycling all wood and steel debris;
- Ensuring that all construction vehicles have noise silencers meeting Cal OSHA standards;
- and

- Limiting construction activities to the County Standards for noise control with operations for equipment limited from 7:30 am to 5:30 pm unless special permission is received from the County.

The following construction activities will generate air pollution:

1. Initial grading will be accomplished with two 637 push-pull scrapers and one D-6 Cat crawler, two pickup trucks and one water truck. The initial grading and sorting of materials will be accomplished in three weeks. The grading equipment will generate 1 ton of CO₂, 200 pounds of organic particulates, and 3 tons of NO_x. Approximately 50 tons of dust will be controlled by the water truck. Six full-time employees will be onsite.
2. Utilities installation will take one month and involve two 20-ton excavators, one small backhoe, three dump trucks and two pickup trucks and one water truck. The utility equipment will generate one ton of CO₂, 200 pounds of organic particulates, and 3 tons of NO_x. Approximately 50 tons of dust will be controlled by the water truck. Six full-time employees will be onsite for the utility installation.
3. Foundation construction will take about two months and will involve two 20-ton excavators, one small backhoe, three dump trucks, ten pickup trucks, one water truck, and one pile driver. Approximately 3,000 cubic yards of concrete will be placed for the foundations involving 10 concrete trucks and one concrete pumper. Approximately 250 piles may be driven involving a large fork lift and 60 semi truck deliveries. There will be a crew of 10 earth workers, 15 carpenters, and 6 driving crew. The foundation equipment will generate 3 tons of CO₂, 400 pounds of organic particulates, and 10 tons of NO_x. Approximately 50 tons of dust will be controlled by the water truck.
4. The placement of the prefabricated Wellness Center units and the erection of the structures for the Office Park will take approximately 18 months and employ a crew of about 30. It will take another 12 months for finish work including the installation of the water recycling system and the solar system. This phase of the project will require two 50-ton cranes, 5 extended lift trucks and about 15 smaller vehicles. Five tractor trailers will make about 2 trips per day to the site each. The erection equipment will generate 4 tons of CO₂, 500 pounds of organic particulates, and 12 tons of NO_x.
5. The construction of the permeable parking lots and fire trails will require approximately 4,000 cubic yards of base rock and 4,000 cubic yards of permeable concrete. It will take about 3 weeks to complete the parking lot. Construction equipment will require a concrete pump truck and 5 concrete trucks. The project will employ a crew of 10. The concrete parking lot equipment will one time generate one ton of CO₂, 200 pounds of organic particulates, and 3 tons of NO_x. Approximately 5 tons of concrete waste will be generated.
6. The construction of the wetlands and landscaping will require about 6 months, 15 laborers, two backhoes and 4 pickup trucks. The landscaping equipment will generate 300 pounds of CO₂, 50 pounds of organic particulates, and 2 tons of NO_x.

The project construction time schedule will be between 30 and 36 months and generate approximately ten tons of CO₂, one ton of particulate pollution, and 30 tons of NO_x.

To ensure that all construction-related air pollution and noise requirements are less than significant, the following dust control plan and mitigations are proposed:

- During grading, a water truck will spray the site at least two times per day to maintain a 15% moisture content in surface soils.
- Maintain a truck wheel and trail cleaning station during grading and construction. Wheel cleaning limits the buildup of dirt on Airport Street.
- Have a street sweeper sweep Airport Street as needed.
- Inspect and clean all trailers to insure that no loose dirt is being transferred offsite.

- As portions of the site reach finish grade, they will be hand seeded with native grass seed consistent with the wetlands design.
- Do not remove vegetation until just prior to grading

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11.0 Visual Aesthetic Impacts

The project is an infill project and will be designed to be less visually intrusive than the development on adjoining sites. The Wellness Center will range from one to three stories (similar to the development in Princeton) and will be wood construction with earth tone colors designed to blend in with the surrounding habitat. The Office Park will consist of three story concrete structures with earth tone coloring.

The project will be landscaped with native trees and plants. The drainage ditch along Airport Street will be planted with willows and alders to screen the view of the buildings from Airport Street and Highway 1 in the distance. The wetlands restoration to the northwest will feature a willow/alder forest with the alder trees approaching and exceeding the building height within ten years. The willow trees along Airport Street will approach 15 feet tall within five years. The wetlands restoration is described in detail in the wetlands design section of this report. The uplands will feature Arroyo, Yellow and Sitka Willow, Red Alders, Coyote Bush, Wax Myrtle, Thimbleberry, Salmonberry, Redtwig Dogwood and a variety of bush and flowering plants.

Figure 11.1 shows the location of the reference photos. *Figures 11.2* through *11.4* show the site prior to construction from Highway 1, Airport Street, and the Maverick's parking lot. *Figures 11.5* through *11.7* show the project immediately after construction.

The project does not approach the ridgeline or block any ocean views from the highway. The project is similar in height to development in Princeton and has a similar long distance view as the mobile home park immediately to the north of the project. The photos demonstrate that the project is an infill project. The earth-tone coloring will make the project less pronounced than both Princeton and the mobile home park that have an abundance of bright white structures. The recreation building at the mobile home park is an elevated structure with the appearance of multiple stories.

The project is visible from the Mavericks parking lot. However, the planting of taller trees will shield this view almost completely in five to ten years. It is the design intent of the project to utilize shielding with native trees with developed height similar to the project building height. This screening has not been implemented by the adjoining properties.

The following mitigations will be implemented to ensure that the visual impacts are not significant:

- All the County Height Standards will be met.
- The buildings will have earth-tone colors so as not to be intrusive.
- The buildings will be shielded with trees with similar heights as the buildings.
- All landscaping and wetlands restoration will utilize native plants.

12.0 Noise

The project will have short-term impacts on noise and air quality during construction, but will be a development with very low noise generation and a number of long-term air quality improvements. The two elements of the project—the Wellness Center (housing and services for developmentally disabled individuals) and the Office Park—will not generate significant levels of noise.

The following construction activities will generate noise and air pollution:

1. Initial grading will be accomplished with two 637 push-pull scrapers, one D-6 Cat crawler, two pickup trucks, and one water truck. The initial grading and sorting of materials will be accomplished in three weeks. The grading equipment will generate one ton of CO₂, 200 pounds of organic particulates, and 3 tons of NO_x. Approximately 50 tons of dust will be controlled by the water truck. Six full time employees will be onsite.
2. Utilities installation will take one month and involve two 20-ton excavators, one small backhoe, three dump trucks and two pickup trucks and one water truck. The utility equipment will one time generate one ton of CO₂, 200 pounds of organic particulates, and 3 tons of NO_x. Approximately 50 tons of dust will be controlled by the water truck. Six full time employees will be onsite for the utility installation.
3. Foundation construction will take about two months and will involve two 20-ton excavators, one small backhoe, three dump trucks, ten pickup trucks, one water truck, and one pile driver. Approximately 3,000 cubic yards of concrete will be placed for the foundations involving 10 concrete trucks and one concrete pumper. Approximately 250 piles may be driven involving a large fork lift. There will be approximately 60 semi truck deliveries. There will be a crew of 10 earth workers, 15 carpenters, and 6 pile driving crew. The foundation equipment will generate 3 tons of CO₂, 400 pounds of organic particulates, and 10 tons of NO_x. Approximately 50 tons of dust will be controlled by the water truck.
4. The placement of the prefabricated Wellness Center units and the erection of the structures for the Office Park will take approximately 18 months and employ a crew of about 30. It will take another 12 months for finish work including the installation of the water recycling system and the solar system. This phase of the project will require two 50-ton cranes, 5 extended lift trucks, and about 15 smaller vehicles. Five tractor trailers will make about 2 trips per day to the site each. The erection equipment will generate 4 tons of CO₂, 500 pounds of organic particulates and 12 tons of NO_x.
5. The construction of the permeable parking lots and fire trails will require approximately 4,000 cubic yards of base rock and 4,000 cubic yards of permeable concrete. It will take about 3 weeks to complete the parking lot. Construction equipment will require a concrete pump truck and 5 concrete trucks. The project will employ a crew of 10. The concrete parking lot equipment will one time generate one ton of CO₂, 200 pounds of organic particulates and 3 tons of NO_x. Approximately 5 tons of concrete waste will be generated.
6. The construction of the wetlands and landscaping will require about 6 months, 15 laborers, two backhoes and 4 pickup trucks. The landscaping equipment will one time generate 300 pounds of CO₂, 50 pounds of organic particulates and 2 tons of NO_x.

The project construction time schedule will be between 30 and 36 months and generate approximately 10 tons of CO₂, 1 ton of particulate pollution, and 30 tons of NO_x.

To ensure that all construction-related air pollution and noise requirements are less than significant, the following mitigations are proposed:

- During grading, a water truck will spray the site at least two times per day. This will ensure dust will not impact nearby airport operations.
- County approved hours of construction will be followed.
- All vehicles will have OSHA approved silencers.
- Construct all facilities to meet airport noise standards. This includes sound proof insulation and double pane windows and skylights and solid core doors.
- Perform a background aircraft noise study during the most heavily trafficked period (one day preceding Dream Machine through one day following).
- Require all tenants and owners to sign releases acknowledging the airport location, ambient noise. The release will also protect the airport and its operations from noise claims and complaints.

12.1 Airport Noise

The proposed project is located over 500 feet from the center of Runway 30. The office park is located approximately 600 feet south west of the south end of Runway 30. The closest residential unit is located approximately 900 feet south west of the south end of Runway 30. All occupied structures are located outside the 500 foot from runway centerline approach zone for runway 30.

Big Wave recognizes the Half Moon Bay Airport as a great asset for both the community at large and the Office Park development. Aircraft access provides a significant financial value for commercial financing of the project. Based on the protecting this value, Big Wave will conduct a worst case noise airport noise evaluation for background ambient airport noise. Big Wave will require that all residents of both the Wellness Center and Office Park sign a release acknowledging the proximity of the airport to their property and acknowledging that airport noise will at a minimum approach the background threshold of the study and acknowledging that future growth of the airport will increase the background noise. All residents will also be required to sign a release preventing claims against the airport and its operations resulting in noise. We will work with the County to establish County conditions of approval and property deed restrictions if necessary.

To ensure that all construction-related air pollution and noise requirements are less than significant, the following mitigations are proposed:

- During grading, a water truck will spray the site at least two times per day. This will ensure dust will not impact nearby airport operations.
- County approved hours of construction will be followed.
- All vehicles will have OSHA approved silencers.
- Construct all facilities to meet airport noise standards. This includes sound proof insulation and double pane windows and skylights and solid core doors.
- Perform a background aircraft noise study during the most heavily trafficked period (one day preceding Dream Machine through one day following).
- Require all tenants and owners to sign releases acknowledging the airport location, ambient noise. The release will also protect the airport and its operations from noise claims and complaints.

13.0 Summary of Mitigations

The Big Wave Project Plan addresses potential project impacts upon aesthetics, air quality, geology, hydrology, hazardous materials, noise, public services and traffic. All impacts can be reduced to less than significant with the following proposed mitigations:

Table 13.0
Summary of Mitigation Measures

| Area of Impact | Mitigation Proposed |
|---|---|
| 4.0 Biological Resources | |
| <i>4.1 Wetlands Delineation</i> | <ul style="list-style-type: none"> • The project will establish a minimum of 100 feet of restored buffer as required by the approved Local Coastal Plan (LCP) from the boundary of delineated State Wetlands. |
| <i>4.2 Biological Resources</i> | <ul style="list-style-type: none"> • Prior to construction, a Fish and Game approved barrier fence will be built to separate the Marsh habitat from the project site. • A wetlands biologist will provide training to construction personnel prior and during construction. • A wetlands biologist will be present during grading operation. • No mechanical grading will occur within Federal or State Wetlands. • Provide a significant wetlands restoration project component based on regional models with design by a qualified geomorphologist and coastal wetlands biologist who is approved by the Fish and Game. • Permanent barriers separating the restored habitat from traffic areas |
| 5.0 Site Hydrology and Hazard Analyses | |

| | |
|---|---|
| <p>5.1 <i>Hydrology and Flood Hazard</i></p> | <ul style="list-style-type: none"> • All site grading and development will avoid construction in Waters of the United States. • All facilities will be located above the 100 year flood elevation. • The standard Corps of Engineers freeboard of 3 feet above the 100 year flood level (Elevation 8.5) will be incorporated into the design for all structures including roadways and parking lots, bringing the minimum site elevation to 11.5 feet. |
| <p>5.2 <i>Tsunami Hazard</i></p> | <ul style="list-style-type: none"> • Develop an evacuation plan approved by the County Operation of Emergency Service (OES) and Fire Department for Fires (most likely scenario, once in 20 year event), earthquake (less likely, once in 100 year event), and tsunami (extremely rare, once in 200 year event for very minor damage). Tsunami evacuation will follow the existing County evacuation plan. Have monthly training exercises for all events. • Coordinate with the County OES to receive tsunami evacuation warning directly. Install a public address system in the facility. • Incorporate heavy vegetation and waddle fencing to slow down velocity of wave run up and debris flow. • Consider wave run up and debris flow in the structural design of the Office Park and Wellness Center housing. • Maintain floor slab elevations above 15 feet (this elevation exceeds the estimated run up elevation for the 200 year event). For the 200 years of recorded tsunamis, no event has impacted this property. |
| <p>5.3 <i>Global Warming Hazard</i></p> | <ul style="list-style-type: none"> • Establish the first floor elevation 2.6 feet (maximum estimated sea level rise in the next 100 years) above the 100 year flood freeboard, bringing the minimum site elevation to 14.1 feet. |
| <p>5.4 <i>Analyses for Minimum Site Grade and Building Floor Elevations</i></p> | <ul style="list-style-type: none"> • Grading mitigation is required to ensure that impacts are less than significant for the combined 100 year frequency flood, the 200 year frequency tsunami and the 100 year maximum projected sea level rise. Combining these three events simultaneously yields a minimum site elevation of 15 feet. The Corps of Engineers generally recommends a 3 foot freeboard for all of their flood and hazard projects. This yields a minimum first floor elevation of 18 feet. |
| <p>5.5 <i>Groundwater Hydrology</i></p> | <ul style="list-style-type: none"> • For continued well pumping and compliance with SMCWPPP Provision C.3, all roof water runoff will be treated in rain garden infiltration systems that will capture 80% of the first flush and 80% of the annual rainfall. • For continued well pumping and compliance with SMCWPPP Provision C.3, all hard surfaces will be constructed with permeable concrete that will capture and infiltrate 80% of the first flush and 80% of the annual rainfall. • To protect the safe yield of the Pillar Point Marsh aquifer, groundwater utilized domestically and for irrigation will not exceed the designed infiltration amount for project infiltration systems. |
| <p>6.0 Site Geology and Soil Investigation</p> | |

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| <p>6.1 Site Geology</p> <p>6.2 Geotechnical Investigation</p> <p>6.3 Contaminated Soils</p> <p>6.4 Building Code Requirements</p> <p>6.5 Geotechnical Peer Review</p> | <ul style="list-style-type: none"> • BAGG will prepare a final design geotechnical report during the final design phase that will address the Treadwell and Rollo concerns. Four additional borings exceeding 60 feet deep (ideally into the Purisima Formation) will be drilled utilizing cone penetration tests. Samples will be tested in the lab to determine the pre-consolidation pressure, the compression index and the consolidation index. The Big Wave Team will organize a series of conference meetings between BAGG and Treadwell and Rollo to finalize the foundation selection and design. • The geological hazard of surface displacement is mitigated by placing all structures outside of the Alquist-Priolo special studies zone. • The severe earthquake shaking hazard will be mitigated by utilizing steel frame or concrete tilt up construction for the Office Park and a combination of steel framing and modular bolted wood structures for the Wellness Center. All structures will be designed by a Structural Engineer for current State Mandated Building Code with the new special seismic requirements. • Expansive soils will be removed from below parking lot substructure. This removal will guarantee good subdrainage and provide quality soil for the wetlands restoration. Building foundations will penetrate below the expansive soils either by over excavating spread footings, installing piles (or piers) or by removal and recompaction of non-expansive engineered fill. • The possible presence of contaminated agricultural soils will be mitigated by sampling and testing every 1000 cubic yards of soil displaced. Soil exceeding limits set by the EPA will be removed from the site. This is a very unlikely scenario. • Settlement due to static loading and dynamic seismic loading will be mitigated by the foundation design recommended by BAGG and Treadwell and Rollo. Design options include excavation and recompaction of a soil mass exceeding eighteen inches and a deep foundation possibly including concrete piers or steel or concrete piles. A rigid foundation limiting differential settlement will be required. Bolt on foundation supports will be utilized to ensure that if differential settlement occurs, adjustments to the building elevations can be made without major structural changes. • The preliminary geotechnical recommendations are based on the 1997 Uniform Building Code. Seismic parameters for shaking, vertical and horizontal loads and liquefaction will be based on the new code (the 2007 State mandated Building Code for detailed design). |
| <p>7.0 Traffic Analyses</p> | |
| <p>7.1 Traffic Report</p> | <ul style="list-style-type: none"> • Develop the project with approximately 225,000 square feet of mixed office space with no offsite traffic improvements. |
| <p>7.2 Site Access , Parking and Circulation</p> | <ul style="list-style-type: none"> • Implement innovative parking options if required for parking exception of 1 parking space for every 250 square feet of office space versus the parking ordinance required one parking space for every 200 square feet of office space. |

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| <p>7.4 <i>Innovative Parking Options</i></p> | <ul style="list-style-type: none"> • Implement parking procedures that result in office workers utilizing ride sharing, shuttle service to park and ride lots, and public transportation. This would allow the County to decrease parking to 1 space for 250 square feet of equivalent office space. Increase the San Mateo County Transit Authority Bus Service along Airport Street. • Provide Shuttle Bus Service from the Park and Ride located in Pacifica, Princeton and Half Moon Bay. • Extend multi-purpose bike and walking trails connecting the project to parks and services. These trails will include the trail to the Post Ridge property and the multipurpose trail along Airport Street and Princeton. |
| <p>7.5 <i>San Mateo County Traffic Mitigation Requirements</i></p> | <ul style="list-style-type: none"> • If the County assesses Traffic Mitigation Fees and agrees that the Fees will be applied to the cost of the Intersection, Big Wave will contribute its fair share toward increased Samtrans bus service between Pacifica, the Project and Downtown Half Moon Bay. |
| <p>8.0 Public Services and Utilities</p> | |
| <p>8.1 <i>Wastewater</i></p> | <ul style="list-style-type: none"> • If Big Wave is connected to the municipal Sanitary District, pay the connection fees for service at the El Granada Sanitary District and obtain a letter authorizing service from the District. • If water is to be recycled, construct a 25,000 gallon per day water recycling plant and obtain a permit to discharge agriculturally from the Regional Water Quality Control Board and the State Health Department. • Low flow fixtures approved by SAM and CCWD will be required. |
| <p>8.2 <i>Water Recycling</i></p> | <ul style="list-style-type: none"> • If water is recycled, it would have to comply with the State Health requirements in Title22 for unrestricted water reuse (2.2 coliform per 100 ml and 2 NTU turbidity units). This would require treatment processes approved by the State Health Department and effluent and operational criteria approved by the State Regional Water Quality Board. • State Certified operators for the water recycling plant would be required. |
| <p>8.3 <i>Ground Water Recharge</i></p> | <ul style="list-style-type: none"> • For continued well pumping and compliance with SMCWPPP Provision C.3, all roof water runoff will be treated in rain garden infiltration systems that will capture 80% of the first flush and 80% of the annual rainfall. • For continued well pumping and compliance with SMCWPPP Provision C.3, all hard surfaces will be constructed with permeable concrete that will capture and infiltrate 80% of the first flush and 80% of the annual rainfall. • To protect the safe yield of the Pillar Point Marsh aquifer, groundwater utilized domestically and for irrigation will not exceed the designed infiltration amount for the project's infiltration systems. |

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| <p>8.5 Onsite Water Treatment</p> | <ul style="list-style-type: none"> • Encroachments and easements will be required for the intake and brine return. • The intake screen will be designed for low velocity so as not to trap small fish and have sufficient opening so as to not clog with marine growth. • Big Wave will design sand filters have been very effective systems for pre-treating influent. • UV treatment before RO has been effective to control growth in the pipeline. • This can be addressed by running a higher flux rate over the RO). • Corrosive water is addressed by adding softer salts into the drinking water. • The Big Wave brine will be retuned and discharged at a lower level than the intake in more or less the same location as the intake. The volume of the brine water (12 gallons per minute) is so small relative to the tidal action of the harbor (700,000 gallons per minute) that the impacts to the bay will be undetectable and un-measurable. The concentration of the brine is only 30% greater (50,000 ppm versus 36,000 ppm). The brine return will be a peak increase of 1.5 pounds of salt per minute into a 210,000 pound per minute tidal flow. The increase in salinity will be less than 0.0007%. Given all of the salinity variation components in the bay, this is un-measurable. |
| <p>9.0 Hazardous Material</p> | |
| <p>9.1 Phase I Environmental Site Assessment</p> | <ul style="list-style-type: none"> • A Phase II ESA will be completed and focused on testing the soil for pesticide pollution. • Surface soil will be tested according to the ASTM standards for Phase II ESA and, if contaminated soil is found, it will be handled in a manner acceptable to San Mateo County’s Health Department. • All ground water will be utilized for landscape and agricultural applications. Ground water will be tested quarterly for contamination. When there is the potential for human contact, only ground water that meets public health standards will be utilized for landscape irrigation. If ground water is to be utilized for domestic use, it will receive adequate treatment that is approved by the County and State Health Departments. • The Storm Water Control System will be maintained in accordance with the Maintenance plan approved by the County. |
| <p>9.3 Design Storm Water Pollution Prevention Program (SMCSWPPP)</p> | <ul style="list-style-type: none"> • Prepare a SMCWPPP that incorporates design measures that will include: protection of sensitive biological areas with minimal changes to the natural topography; minimization of impervious surfaces; minimization of impervious areas connected to the storm drains; maximize permeability by preserving open space; use permeable pavement for parking and walkways; use landscaping to treat storm water; and use native plants for all landscaping. |

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| <p><i>9.4 Construction Pollution Prevention Program (SMCSWPPP)</i></p> | <ul style="list-style-type: none"> • During site grading all of the surface soils will be tested in accordance to the ASTM Standard Practice for Environmental Assessment and with the County Health Requirements. Any soils deemed contaminated will be treated onsite or removed from the site, if necessary. Due to their high organic concentrations, all surface soils will be utilized in the restored wetlands and landscaped areas on the site. • Obtain SMCWPPP permit for construction with Construction BMP's for handling and storage of construction materials and waste; to control and prevent discharge of all potential pollutants; for equipment, which will be parked in a contained area for cleaning and fueling; for siltation fencing and straw wattles, which will be installed prior to grading (concrete waste will be contained); for delineation of sensitive habitat to be protected; to protect adjacent properties with sediment barriers; for clearing grading in dry weather; and for all construction fuel containment (will be double contained on the site). • All motorized equipment will have OSHA approved silencers. All engines will meet current Air Quality Control Standards. • The County's noise control standards will be met and the County's required hours of operation will be followed. • No grading will occur during the wet weather season. • If visible soil material is carried onto the street, sweep Airport Street daily with wet sweepers. • Obtain a NPDES Storm Water Permit from the Regional Board prior to construction. |
| <p>10.0 Air Quality / Noise</p> | |
| <p><i>10.1 Air Quality</i></p> | <ul style="list-style-type: none"> • To reduce air pollution, reduce traffic along Highway 1 and Highway 92. • To reduce air pollution: <ul style="list-style-type: none"> ○ Focus the design on techniques and materials that reduce air and water pollution, as described in the US Design and Building Council LEED (Leadership in Environmental and Energy Design); ○ Maximize CO₂ uptake with landscaping; ○ Maximize onsite energy management and energy production; and ○ Emphasize alternative transportation methods. |
| <p><i>10.2 Construction Noise, Air Quality</i></p> | <ul style="list-style-type: none"> • All vehicles will have OSHA approved silencers. • During grading, a water truck will spray the site at least two times per day. • Big Wave will adhere to the County approved hours of construction. • Construct all facilities to meet airport noise standards. This includes sound proof insulation and double pane windows and skylights and solid core doors. • Perform a background aircraft noise study during the most heavily trafficked period (one day proceeding Dream Machine through one day following). • Require all tenants and owners to sign releases acknowledging the airport location, ambient noise. The release will also protect the Airport and its operations from noise claims and complaints. |
| <p>11.0 Visual Aesthetic Impacts</p> | |
| | <ul style="list-style-type: none"> • All County Height Standards will be met. • The buildings will have earth tone colors so as not to be intrusive. • The buildings will be shielded with trees (trees will be similar to buildings in height). • All landscaping and wetlands restoration will utilize native plants. |

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| 12.0 Noise | |
| <i>12.1 Airport Noise</i> | <ul style="list-style-type: none"> • During grading, a water truck will spray the site at least two times per day. This will ensure dust will not impact nearby airport operations. • County approved hours of construction will be followed. • All vehicles will have OSHA approved silencers. • Construct all facilities to meet airport noise standards. This includes sound proof insulation and double pane windows and skylights and solid core doors. • Perform a background aircraft noise study during the most heavily trafficked period (one day preceding Dream Machine through one day following). • Require all tenants and owners to sign releases acknowledging the airport location, ambient noise. The release will also protect the airport and its operations from noise claims and complaints. |

14.0 Alternative Analyses

14.1 Method of Analyses

The basis for selecting the best alternatives involves a comparison of how each alternative meets the stated goals and objectives. In an attempt to objectify the analyses, one point will be given if the alternative meets the goal. No points will be given if the alternative does not meet the goal. Some alternatives meet the goal better than others. For example, one alternative may meet the goal of reducing CO₂ by 1,000 tons per year and another alternative may reduce CO₂ by 2,000 tons. For this option, two goals will be set, one for 1,000 tons and one for 2,000 tons. The alternative that reduces CO₂ by 2,000 tons will get a yes for 1,000 tons and a yes for 2,000 tons. This alternative will receive a point value of two points while the other will receive only one point.

Environmental sustainability was given the highest point potential because it is the most critical element in the CEQA evaluation. A large point allocation was given to compliance issues with resource agencies, native habitat restoration, air pollution, water pollution and LEED certification.

The alternative with the highest points for environmental goals will be considered the Environmentally Superior Alternative. The alternative with the highest point total for all goals including environmental goals will be the Apparent Best Alternative.

14.2 Summary of the Basis for Analysis

The stated goals and objectives serve as the basis for our analysis. Below is a summary of those objectives:

Environmental Sustainability:

- Establish a minimum of 100 feet of restored buffer as required by the approved Local Coastal Plan (LCP) from the boundary of delineated State Wetlands.

- Provide five (5) acres of significant wetlands restoration as a project component (based on regional models) with design by a qualified geomorphologist and coastal wetlands biologist approved by the Fish and Game.
- Provides nine (9) acres of significant wetlands restoration project component based on regional models with design by qualified geomorphologist and coastal wetlands biologist approved by the Fish and Game.
- Provides five (5) acres of enhanced functioning habitat for threatened and endangered species
- Provides nine (9) acres of enhanced functioning habitat for threatened and endangered species
- Provides five (5) acres of enhanced bird habitat
- Provides nine (9) acres of enhanced bird habitat
- Provide high density development to maximize the open space for wetlands restoration
- Integrate the restoration into the development area to increase the restoration area while providing protection to the habitat from the development
- Design all grading and development to avoid construction in Waters of the United States.
- Ensure all facilities will be located above the 100-year flood elevation.
- Provide the standard Corps of Engineers freeboard of three (3) feet above the 100 year flood level (Elevation 8.5)
- Design the project so that the 200 year tsunami event does not impact the project.
- Design the project so that 100 year global warming does not impact the project.
- To protect the safe yield of the Pillar Point Marsh aquifer, groundwater (utilized domestically and for irrigation) will not exceed the designed infiltration amount for project infiltration systems.
- Improve traffic congestion on Highway 1 and Highway 92.
- Implement parking procedures that result in 35% of the office workers utilizing ride sharing, shuttle service to park and ride lots and public transportation.
- Ensure that there is no ground water pollution.
- Ensure that there is no soil pollution and that clean up occurs following any incidents, if necessary.
- Prepare a SMCWPPP that incorporates design measures that will include: protection of sensitive biological areas with minimal changes to the natural topography; minimization of impervious surface; minimization of impervious areas connected to the storm drains; maximization of permeability by preserving open space; use of permeable pavement for parking and walkways; use of landscaping to treat storm water and use of native plants for all landscaping.
- Reduce air pollution by reducing traffic along Highway 1 and Highway 92 by 350 tons per year.
- Reduce air pollution by reducing traffic along Highway 1 and Highway 92 by 500 tons per year.
- Reduce air pollution, focus the design on techniques and materials that reduce air and water pollution as described in the US Design and Building Council LEED (Leadership in Environmental and Energy Design).
- Reduce air pollution by 100 tons per year by maximizing CO₂ uptake with landscaping.
- Reduce air pollution by 200 tons per year by maximizing CO₂ uptake with landscaping.
- Reduce air pollution by 50 tons per year by maximizing onsite energy management and energy production.
- Reduce air pollution by 80 tons per year by maximizing onsite energy management and energy production.
- Reduce air pollution, emphasize alternative transportation.
- Obtain Platinum or Gold LEED certification.
- Increased farm potential: 25 acres of leased land zoned industrial in the airport for permanent high yield farming with recycled water.
- Construct bicycle storage and changing facilities.

- Provide priority parking for low-emitting fuel efficient vehicles (5% of total parking spaces)
- Parking will not be sized to exceed local parking ordinances. Ideally, parking will be more efficient than the current parking ordinances.
- The project maximizes open space with 50% of the entire site to be restored as wetlands. The developed coverage is far less than is required by the County Planning Department
- The project maximizes open space with 47% of the entire site to be restored as wetlands. The developed coverage is far less than is allowed by the County Planning Department.
- The storm water design significantly reduces existing impermeable surface. The proposed project has less than 25% permeable surfaces.
- The storm water design maximizes infiltration and native plant evapotranspiration.
- Use permeable pavement. This is concrete with a high reflectivity and porous open-grid design.
- Minimize lighting pollution.
- The project will include tenant guidelines designed for energy efficiency and environmental protection.
- There will be no permanent landscape irrigation unless it is with recycled water. All landscaping is with native plants that do not require water or maintenance once mature.
- The project may include recycling all its water for irrigation and toilet flushing. Ground water recharge systems will exceed the usage amount.
- Use geothermal cooling without refrigerants.
- Power will be produced by solar and/or wind.
- Over 50% of the construction waste will be recycled with a goal of 75%.
- Smoking in the buildings will be limited on site.
- Big Wave plans to recycle at least 50% of all operational materials with a goal of 75%.
- The project will employ LEED accredited professionals focusing on a certified innovative design process.
- Provides recycled water.
- Reduces chlorinated hydrocarbon pollution.
- Protects wild and scenic rivers.
- Protects water quality in the Sacramento Delta.

Privately Funded Wellness Center:

- Wellness Center generates over \$5,000,000 in initial private funding.
- Wellness Center generates over \$6,000,000 in initial private funding

Provide Affordable Housing:

- Provide mortgage costs for home ownership of less than \$2,000 per month.
- Provide mortgage costs for DD home ownership of less than \$1,000 per month.
- Provide mortgage costs for DD home ownership of less than \$500 per month.
- Provide below market rate housing to the caregivers of the developmentally disabled (DD) to attract and to retain better caregivers.

Enriched Quality of Life for Developmentally Disabled Residents:

- Safe and secure home made available for developmentally disabled (DD) residents with access within walking or wheel chair distance to jobs both on the Wellness Center site and in the adjacent Office Park; accessible, on-site staff and caregivers (for assistance in daily life as well as to serve as mentors to the DD); supervised maintenance programs that utilize resident labor to reduce the costs of properly maintaining grounds and structures.
- Provide numerous additional services including: healthy, organic, diet-sensitive prepared meals in a communal dining room; recreational and artistic opportunity in a Great Room and onsite; library and learning rooms for continuing education; open space, gardens, basketball courts as well as wetland and environmental education on site.

- Provide robust commercial enterprises both on-site and in the Office Park that provide ever-increasing, recurring, inflation-adjusted revenue to the Wellness Center with surplus revenue utilized to reduce the living expenses of the residents.
- A goal is to have the commercial ventures pay for nearly 100% of the cost of living for the residents as well as provide additional services for the developmentally disabled residents.

Strong Sense of Community:

- A diverse group of people will be constantly interacting doing the stuff of life. This includes learning, playing, working, volunteering, mentoring and being mentored, growing and selling food, creating and selling goods, starting and growing businesses, practicing shared self sufficiency, enjoying alternative energy creation, maintaining shared grounds and personal space, as well as caring for the natural environment.
- The residents of the Big Wave Wellness Center and businesses in the Big Wave Office Park both will have the opportunity to own their spaces, instead of simply renting.
- The building construction and the services offered in the Wellness Center will be designed to encourage and create interaction between residents. Residents, for example, will take meals (prepared with the help of other residents) in a communal setting to encourage social interaction.

Jobs and Careers:

- Generates over 300 highly skilled office jobs on the Coastside
- Generates over 600 highly skilled office jobs on the Coastside
- Generates over 800 highly skilled office jobs on the Coastside
- Generates over 40 jobs for DD individuals on the Coastside
- Generates over 80 jobs for DD individuals on the Coastside
 - The Wellness Center kitchen and dining staff, Big Wave Store, Deli, Bakery, food prep for employees at Office Park, egg and food delivery to the Office Park
 - Big Wave Farming, Big Wave wetlands restoration and native plant nursery
 - Wellness Center and Office Park Maintenance, Big Wave Administration, Health Center, dog walking and grooming services
 - Maintenance of:
 - Alternative energy system
 - Alternative communication system
 - Water and sewage recycling system

Financial Sustainability:

- Demonstrated financial sustainability of the Office Park
- Wellness Center generates more than \$1,000,000 in annual revenue
- Wellness Center generates more than \$500,000 in annual revenue

Cultural Longevity:

- Establish a Board of Directors with a strong, consistent corporate culture, ensuring that:
 - All employees (from the CEO to the dishwasher) understand the goals of Big Wave.
 - Teach the proper culture by example.
 - The Board members of Big Wave believe that excellence in effort should be properly recognized.
- Big Wave will use the revenue from its successful business enterprises to pay all employees above the scale normally paid for similar work in similar industries. This practice will allow Big Wave to hire a higher caliber of employee and to retain that

employee for longer periods which will in turn provide additional stability to the lives of the residents.

Consistent With Local Planning Goals:

- Consistent with the County's General Plan and Zoning Regulations
- Develop a commercial project which would meet the requirements of the Local Coastal Program to develop a job oriented site.
- Consistent with all county, state and federal regulations for habitat and endangered species protection
- Consistent with the County Local Coastal Plan for the Mid Coast

14.3 Alternative Analyses

All of the feasible goals that have been discussed in the scoping session and those identified by the owners, the County, and the consultants will be analyzed. For example, abandoning this project and building it somewhere else is not a feasible alternative for this project, it is an alternative for another project somewhere else. For this project, the "no project" alternative is the continued farming alternative because that is the current state of the land without a project. Abandoning farming is an alternative that is not considered feasible, because there is an economic reason for the owners to continue farming and farming is allowed if this project is not constructed.

The alternatives to be analyzed include:

- **Alternative 1:** No Project – Continued Farming
- **Alternative 2:** Donate the 5 acre site without wetlands restoration and develop the 14 acre site with wetlands restoration and Office Park
- **Alternative 3:** Develop 5 acre Wellness site and 15 acre Office Park with restoration (225,000 sq. ft.)

Alternative 2 assumes that the 5 acre parcel would no longer be farmed and would be donated to a public agency (like POST) and not be restored as part of this project. The fourteen acre site is not zoned for the Wellness Center. Alternative 2 is only being analyzed academically and is not considered a feasible alternative, because the main project goals revolve around the Wellness Center. If the Wellness Center is not constructed, the main project goals will not be met.

Alternative 3 restores the wetlands in the buffer area.

See chart on the following page.

| <u>Goals</u> | <u>Alternatives</u> (meets goals: yes/no, 1 point for yes) | <u>Comments</u> |
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| <i>Environmental Sustainability</i> | <i>Alt 1</i> | <i>Alt 2</i> | <i>Alt 3</i> | |
|---|--------------|--------------|--------------|---|
| <ul style="list-style-type: none"> Establish a minimum of 100 feet of restored buffer as required by the approved Local Coastal Plan (LCP) from the boundary of delineated State Wetlands. | No | Yes | Yes | Farming is exempt from most environmental laws. |
| <ul style="list-style-type: none"> Provides five (5) acres of significant wetlands restoration as a project component (based on regional models) with design by a qualified geomorphologist and a coastal wetlands biologist approved by the Fish and Game Department. | No | Yes | Yes | |
| <ul style="list-style-type: none"> Provides nine (9) acres of significant wetlands restoration project component based on regional models with design by a qualified geomorphologist and a coastal wetlands biologist approved by the Fish and Game Department. | No | No | Yes | |
| <ul style="list-style-type: none"> Provides five (5) acres of enhanced functioning habitat for threatened and endangered species. | No | Yes | Yes | |
| <ul style="list-style-type: none"> Provides nine (9) acres of enhanced functioning habitat for threatened and endangered species. | No | No | Yes | |
| <ul style="list-style-type: none"> Provides five (5) acres of enhanced bird habitat. | No | Yes | Yes | |
| <ul style="list-style-type: none"> Provides nine (9) acres of enhanced bird habitat. | No | No | Yes | |
| <ul style="list-style-type: none"> Provide high density development to maximize the open space for wetlands restoration. | No | Yes | Yes | |
| <ul style="list-style-type: none"> Integrate the restoration into the development area to increase the restoration area while providing protection of the habitat from the development. | No | Yes | Yes | |
| <ul style="list-style-type: none"> Design all grading and development to avoid construction in Waters of the United States. | No | Yes | Yes | |
| <ul style="list-style-type: none"> Ensure all facilities will be located above the 100 year flood elevation. | No | Yes | Yes | Farming is exempt. |
| <ul style="list-style-type: none"> Provide the standard Corps of Engineers freeboard of 3 feet above the 100 year flood level (Elevation 8.5). | Yes | Yes | Yes | |
| <ul style="list-style-type: none"> Design the project so that the 200 year tsunami event does not impact the project. | Yes | Yes | Yes | |
| <ul style="list-style-type: none"> Design the project so that the impact of 100 year global warming does not impact the project. | Yes | Yes | Yes | |

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| <p><i>Privately Funded Wellness Center</i></p> <ul style="list-style-type: none"> • Wellness Center generates over \$5,000,000 in initial private funding. • Wellness Center generates over \$6,000,000 in initial private funding. <p>Total Points for WC Private Funding =</p> | <p><i>Alt 1</i></p> <p>No</p> <p>No</p> <p>0</p> | <p><i>Alt 2</i></p> <p>No</p> <p>No</p> <p>0</p> | <p><i>Alt 3</i></p> <p>Yes</p> <p>Yes</p> <p>2</p> | <p>No Wellness Center equals no donation by Big Wave, LLC. The larger the Office Park, the larger the donation.</p> |
| <p><i>Provide Affordable Housing</i></p> <ul style="list-style-type: none"> • Provide mortgage costs for home ownership of less than \$2,000 per month. • Provide mortgage costs for DD home ownership of less than \$500 per month. • Provide below market rate housing to the caregivers of the DD to attract and to retain better caregivers. <p>Total Points for Affordable Housing =</p> | <p><i>Alt 1</i></p> <p>No</p> <p>No</p> <p>No</p> <p>0</p> | <p><i>Alt 2</i></p> <p>No</p> <p>No</p> <p>No</p> <p>0</p> | <p><i>Alt 3</i></p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>3</p> | <p>The larger the Office Park, the greater financial contribution to housing.</p> |

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| <i>Enriched Quality of Life for Developmentally Delayed Residents</i> | <i>Alt 1</i> | <i>Alt 2</i> | <i>Alt 3</i> | |
|--|--------------|--------------|--------------|---|
| <ul style="list-style-type: none"> • Safe and secure home offered for DD residents with access within walking or wheel chair distance to jobs both on the Wellness Center site and in the adjacent Office Park, accessible, on-site staff and caregivers (for assistance in daily life as well as to serve as mentors to the DD), supervised maintenance programs that utilize resident labor to reduce the costs of properly maintaining grounds and structures. | No | No | Yes | The Big Wave Project will enrich the lives of all Coastside DD residents. |
| <ul style="list-style-type: none"> • Provide numerous additional services including: healthy, organic, diet-sensitive prepared meals in a communal dining room; recreational and artistic opportunity in a Great Room and onsite; library and learning rooms for continuing education; open space, gardens, basketball courts and wetland and environmental education on site. | No | No | Yes | |
| <ul style="list-style-type: none"> • Provide robust commercial enterprises (both onsite and in the Office Park) that provide ever-increasing recurring, inflation-adjusted revenue to the Wellness Center with surplus revenue being used to reduce the living expenses of the residents. | No | No | Yes | |
| <ul style="list-style-type: none"> • A goal is to have the commercial ventures pay for nearly 100% of the cost of living for the residents as well as provide additional services for the developmentally disabled residents. | No | No | Yes | |
| <p>Total Points for Enriched Quality of Life for Developmentally Delayed Residents =</p> | | | | |

| <i>Strong Sense of Community</i> | <i>Alt 1</i> | <i>Alt 2</i> | <i>Alt 3</i> | |
|--|--------------|--------------|--------------|--|
| <ul style="list-style-type: none"> A diverse group of people will be constantly interacting doing the stuff of life. This includes learning, playing, working, volunteering, mentoring and being mentored, growing and selling food, creating and selling goods, starting and growing businesses, practicing shared self sufficiency, enjoying alternative energy creation, maintaining shared grounds and personal space, as well as caring for the natural environment. | No | Yes | Yes | |
| <ul style="list-style-type: none"> The residents of Big Wave Wellness Center and businesses in Big Wave Office Park will both have the opportunity to own their spaces instead of simply renting. | No | Yes | Yes | |
| <ul style="list-style-type: none"> The building construction and the services to be offered in the Wellness Center are designed to encourage and create interaction between residents. Residents, for example, will take meals prepared with the help of residents in a communal setting to encourage social interaction. | No | No | Yes | |
| <p>Total Points for Strong Sense of Community =</p> | 0 | 2 | 3 | |

| <i>Jobs and Careers</i> | <i>Alt 1</i> | <i>Alt 2</i> | <i>Alt 3</i> | |
|--|--------------|--------------|--------------|--|
| <ul style="list-style-type: none"> • Generates over 300 highly skilled office jobs on the Coastside • Generates over 600 highly skilled office jobs on the Coastside • Generates over 800 highly skilled office jobs on the Coastside • Generates over 40 jobs for DD individuals on the Coastside • Generates over 80 jobs for DD individuals on the Coastside • Wellness Center kitchen and dining staff, Big Wave Store, Deli, Bakery, food prep for employees at Office Park, egg and food delivery to Office Park • Big Wave Farming, Big Wave wetlands restoration and native plant nursery • Maintenance, Wellness Center and Office Park, Big Wave administration, Health Center, dog walking and grooming • Maintaining alternative energy system, maintaining alternative communication system as well as maintaining water and sewage recycling system | No | Yes | Yes | Developing jobs on the Coastside is a goal of the County and the project. Farming generates the least number of jobs. The Wellness Center generates over 100 jobs including staff. The bigger Office Park generates the most office jobs on the Coastside. |
| | No | Yes | Yes | |
| | No | Yes | Yes | |
| | No | No | Yes | |
| | No | No | Yes | |
| | No | No | Yes | |
| | Yes | Yes | Yes | |
| | No | Yes | Yes | |
| | No | Yes | Yes | |
| Total Points for Jobs and Careers = | No | Yes | Yes | |
| | 1 | 6 | 9 | |

| <i>Financial Sustainability</i> | <i>Alt 1</i> | <i>Alt 2</i> | <i>Alt 3</i> | |
|--|--------------|--------------|--------------|--|
| <ul style="list-style-type: none"> • Demonstrated Financial Sustainability of the Office Park • Wellness Center generates more than \$1,000,000 in annual revenue • Wellness Center generates more than \$500,000 in annual revenue | No | Yes | Yes | |
| | No | No | Yes | |
| | No | No | Yes | |
| Total Points Financial Sustainability = | 0 | 1 | 3 | |
| <i>Cultural Longevity</i> | <i>Alt 1</i> | <i>Alt 2</i> | <i>Alt 3</i> | |
| <ul style="list-style-type: none"> • Establish a Board of Directors with a strong, consistent corporate culture; ensure all employees (from the CEO to the dishwasher) will understand the goals of Big Wave; teach the proper culture by example; and ensure that the Boards of Big Wave believe that excellence in effort should be properly recognized. • Big Wave will use the revenue from its successful business enterprises to pay all employees above the scale normally paid for similar work in similar industries. This practice will both allow Big Wave to hire a higher caliber of employee and to retain that employee for longer periods to provide additional stability to the lives of the residents. | No | No | Yes | Without stable housing, the culture will be ever changing. |
| | No | No | Yes | Smaller Office Park will tighten cash flow. |
| Total Points for Cultural Longevity = | 0 | 0 | 2 | |

| <i>Consistent With Local Planning Goals</i> | <i>Alt 1</i> | <i>Alt 2</i> | <i>Alt 3</i> | |
|---|--------------|--------------|--------------|--|
| <ul style="list-style-type: none"> Consistent with the County's General Plan and Zoning Regulations. Develop a commercial project which would meet the requirements of the Local Coastal Program to develop a job-oriented site. Consistent with all county, state and federal regulations for habitat and endangered species protection. Consistent with San Mateo County, Local Coastal Plan for the Mid Coast. | No | Yes | Yes | The property is not zoned agricultural, but agriculture is allowed. All Development project meets zoning and planning. |
| | No | Yes | Yes | |
| | No | Yes | Yes | Farming is exempt from Wetlands Regulations. |
| | Yes | Yes | Yes | |
| Total Points for Consistency With Local Planning Goals = | 1 | 4 | 4 | |
| Total Points, Environmental = | 15 | 40 | 51 | |
| Total Points, Non-environmental = | 2 | 11 | 30 | |
| Total Points, All Goals and Objectives = | 17 | 51 | 81 | |

14.4 Environmentally Superior and Apparent Best Alternative

Alternative 3 has the largest restoration component. Alternative 3 has a greater reduction of traffic on Highway 1. Alternatives 1 and 2 have greater open space ratings. The existing use as farming has the lowest environmental value. Even farming in fallow years generally produces weeds and a degraded habitat. The current farming operation is not environmentally sustainable and relies on ground water.

The environmentally superior alternative is Alternative 3. This is the project with the full environmental restoration, the Wellness Center, 225,000 square feet of office space, full roof solar, solar heating, geothermal cooling, traffic TDMs, porous concrete parking lot and walkways, water recycling, ground water infiltration systems and LEED certified platinum, hiking trails and bicycle storage.

The alternatives that did not include the Wellness Center fared poorly because the building of the Wellness Center is the major project goal. The large Office Park option provided the highest level of revenue to the Wellness Center and scored the highest. **Alternative 3** is the Apparent Best Alternative.

15.0 Permit Requirements

The following permits will be required:

- California Coastal Permit (through San Mateo County Local Coastal Plan)

- Grading permit in compliance with SMCWPPP Provision C.3
- San Mateo County NPDES permit for construction
- Regional Water Quality Control Board NPDES permit for construction
- Bay Area Air Quality Control Management District Construction permit
- Regional Water Quality Control Board NPDES permit for the operation of the water recycling plant and irrigation with recycled water
- State Health Department permit for the operation of the water treatment facilities
- Building permits

16.0 CEQA Required Assessment

16.1 Significant Unavoidable Impacts

There are no significant, unavoidable impacts associated with the project. All impacts can and will be mitigated, as shown in Chapter 13, Summary of Mitigations. The project description identifies the following key impacts that can be reduced through mitigations:

- *Wetlands Delineation:* The project will establish a minimum of 100 feet of restored buffer from the boundary of delineated State Wetlands, as required by the approved Local Coastal Plan (LCP). All site grading and development will avoid construction in Waters

- of the United States. The project includes a significant wetlands restoration component based on regional models that are designed by a qualified geomorphologist and coastal wetlands biologist (approved by the California Department of Fish and Game). Permanent barriers separating the restored habitat from traffic areas will be erected.
- *Natural Hazards:* Grading mitigation is required to ensure that impacts are less than significant for the combined 100 year frequency flood, the 200 year frequency tsunami and the 100 year maximum projected sea level rise. Combining these three events simultaneously yields a minimum site elevation of 15 feet. The Corps of Engineers generally recommends a 3 foot freeboard for all of their flood and hazard projects. This yields a minimum first floor elevation of 18 feet.
 - *Ground Water:* To protect the safe yield of the Pillar Point Marsh aquifer, groundwater utilized domestically and utilized for irrigation will not exceed the designed infiltration amount for the project's infiltration systems. The Big Wave Project will involve building a ten acre ground water infiltration system comprised of rainwater gardens for roof runoff and permeable concrete parking lots and walkways constructed over permeable soils.
 - *Traffic Analyses:* If the Office Park Exceeds 150,000 square feet, installation of a signal at Cypress and Highway 1 will be requisite.
 - *Parking:* The County Parking ordinance is met for 150,000 square feet of office space. The innovative parking proposals outlined in the traffic section (*Chapter 7.0*) will have to be approved for construction of 225,000 square feet of office space.
 - *Hazardous Material:* Surface soil will be tested according to the ASTM standards for Phase II ESA. Ground water will be tested quarterly for contamination.
 - *Noise:* Construction will result in considerable temporary noise. Construction noise will be mitigated by County limits on construction hours.

16.2 Irreversible Environmental Changes

The project will convert 20 acres of long term farmed land into ten acres of commercial and residential development (three acres of buildings and seven acres of parking) and ten acres of restored wetlands. The project also intends to enter into a long term lease for 20 acres of industrially/commercially zoned land in the airport runway approach for high yield, irrigated farming.

The long term environmental changes will be positive. The project is designed to be energy, water, ground water and habitat sustainable. The project is planned to be LEED Certified Platinum; capable of producing all its energy onsite, all its water on site and recycling all of the water for toilet flushing and agricultural application. The project will recharge the ground water table. The project will generate a community for its special needs, ultra low income residents while also creating over 80 jobs for the area's developmentally disabled population (employment open to non-Wellness Center residents and Wellness Center residents). The project is capable of providing office space for 15% of the Coastsides' professionals who currently commute more than 30 miles to work, five days a week.

16.3 Growth Inducing Impacts

The project is not growth inducing. Needed Coastsides office space is being provided for Coastsides residents. The Wellness Center provides housing for Coastsides developmentally delayed children and adults.

16.4 Cumulative Impacts

The cumulative project impacts are primarily associated with traffic and are analyzed in the Traffic Report provided in *Appendix 7.1*. The cumulative traffic impacts are summarized in Table 9 of the

Traffic Report. There is virtually no change in the LOS ratings or intersection delays with the exception of the intersection of Cypress and Highway 1. The traffic consultant recommends that San Mateo County monitor volumes at the Cypress and Highway 1 intersection to determine whether signalization becomes warranted as the Cumulative Traffic on the Coastsides increases. If it is warranted, a traffic signal will reduce impacts to less than significant. Also, this intersection may be mitigated to less than significant impact with innovative transportation measures (as outlined in the County Traffic Ordinance, *Appendix 7.2*).

The impacts associated with the restoration of the native wetlands for 56% of the property have a net positive environmental effect over continued farming operation. Improving 20 acres of low yield, non irrigated property within the airport overlay, mitigate taking the project site out of farm production.

The ground water infiltration system will increase ground water recharge over the current amount and over the amount proposed to be used for farming.

Providing office space on the Coastsides in Princeton will reduce peak hour congestion on Highway 1 and the long term cumulative traffic impact associated with growth on the Coastsides.

16.5 Effects Found To Be “Not Significant”

The following effects were found to be “not significant”:

- *Land Use*: The project conforms to the local land use policies of San Mateo County and the Local Coastal Plan. The project does not require any variances or exceptions to local, state or federal law. If the commercial development exceeds 150,000 square feet, the county would have to allow one parking space for every 350 square feet of office space, as long as the project complies with the exception criteria in the parking ordinance.
- *Aesthetics*: The project will not block coastal or ridgeline views. The project is designed to be shielded by native vegetation. The project will be colored with earth tones.
- *Air Quality*: By reducing traffic congestion, the project reduces air pollution.
- *Geology*: The project is designed to match the geological constraints.

17.0 Construction Schedule

The proposed construction schedule is described in the following section. It is understood that there will be slippage due to appeals and regulatory requirements. However, the purpose of this section is to state the goals and move the project towards meeting the stated objectives.

| <u>Objective</u> | <u>Start Date</u> | <u>Comple. Date</u> |
|---|--------------------------|----------------------------|
| Grow Native Plant (Agriculture) | Aug 1, 2008 | April 30, 2010 |
| Complete Draft Facilities Plan | Feb 24, 2008 | Sept. 8, 2008 |
| Final Project Description, Final Facilities Plan | Dec 1, 2008 | Jan 15, 2009 |
| Administrative Draft EIR | Jan 1, 2009 | Feb 15, 2009 |
| Final Draft EIR | March 1, 2009 | March 15, 2009 |
| Circulate Final Draft EIR | April 1, 2009 | June 1, 2009 |
| Complete and Respond to Questions for Final EIR | June 2, 2009 | June 30, 2009 |
| Planning Commission Meeting, Staff Report, Coastal Permit, EIR Certification, LAFCO CCWD approval | July 1, 2009 | August 1, 2009 |
| Appeal and additional Hearings with Planning Commission and Board of Supervisors | August 16, 2009 | Sept 1, 2009 |
| Appeal to the Coastal Commission and Staff Report Preparation | Sept 15, 2009 | Feb 1, 2010 |
| Coastal Commission Hearing Issuance of Coastal Permit | Feb 1, 2010 | Feb 15, 2010 |
| Issuance of Grading Permit | April 1, 2010 | April 1, 2010 |
| Rough Grade Site | April 10, 2010 | May 15, 2010, |
| Install Underground Conduits | June 1, 2010 | July 15, 2010 |
| Construct Foundations, End Earthwork and Secure Site (NPDES Compliance) | Aug 10, 2010 | Sept 30, 2010 |
| Construct Wellness Center | Sept 30, 2010 | Sept 30, 2011 |
| Construct Fire Suppression System | July 30, 2010 | Sept 30, 2011 |
| Construct Water Recycling Plant | May 15, 2010 | Sept 30, 2010 |
| Construct Wellness Center Water System | May 15, 2011 | Sept 30, 2011 |
| Construct Office Park Building D | Sept 30, 2009 | Sept 30, 2010 |

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| | | |
|--|---------------|---------------|
| Construct Office Park Communications Building | Sept 30, 2009 | Sept 30, 2010 |
| Construct Office Park Building C | Sept 30, 2009 | Sept 30, 2010 |
| Construct Wellness Center Parking Lot, Fire Trail and Walkways | May 15, 2010 | Sept 30, 2010 |
| Construct Office Park Parking and Walkway (Phase 1, South two driveway accesses and south east portion of lot) | May 15, 2010 | Sept 30, 2010 |
| Construct Office Park Building B | May 15, 2011 | May 15, 2012 |
| Resolve County Parking Ordinance Requirements (1 space/350 ft sq), Implement Innovative Parking Requirements | Aug 15, 2008 | Sept 30, 2010 |
| Construct Office Park Building A | May 15, 2011 | May 15, 2012 |
| Convert First Floors to Office Space | May 15, 2012 | Sept 30, 2012 |
| Construct Cypress Light | May 15, 2012 | Sept 30, 2012 |
| Construct Sustainable Organic Farm | July 1, 2010 | July 1, 2011 |
| Install Irrigation System in 20 acre leased farm | July 1, 2009 | March 2010 |
| Occupy Wellness Center | Sept 30, 2010 | Sept 30, 2012 |
| Occupy Office Park Building D and C | Sept 30, 2010 | Sept 30, 2012 |
| Occupy Office Park Building B and A | Sept 30, 2011 | Sept 30, 2013 |

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