Program Goals

Informal education within the context of the Informal Science Education (ISE) Program is defined as learning which is voluntary and self-directed, life-long, and motivated mainly by intrinsic interests like curiosity, exploration, manipulation, task completion, and social interaction. Informal learning can be linear or non-linear and often is self-paced and visual-or object-oriented. Informal education is also characterized as learning that provides an experiential base and motivation for further activity and learning. The outcomes of an informal learning experience in science includes a better understanding of the process of science and scientific thinking, as well as increased knowledge about specific topics and about scientists and careers in the sciences.

Projects supported by this Program are designed to provide rich and stimulating environments outside of formal classroom settings, where individuals of all ages, interests, and backgrounds can increase their appreciation and understanding of science, mathematics, and their applications. These projects include but are not limited to: television series and programs for youth or for the general public; films on science, math, and technological topics; exhibits or educational programs at science and natural history museums, science-technology centers, aquaria, nature centers, botanical gardens, arboreta, zoological parks, and libraries; and educational programs and activities at community and youth centers.

Most ISE projects are designed to reach large audiences and to have the potential for significant regional or national impact.

The ISE Program will emphasize the following directions in order to produce significant positive changes during the coming year. These goals are:

- to increase the number of youth, particularly underrepresented and underserved (e.g. minorities, disadvantaged, and women) who are excited about science, mathematics, and technology, and who pursue such activities both in and out of school;
- to establish linkages which promote new relationships between informal and formal education resulting in improved and creative science, mathematics and technology education in all learning environments;
- to stimulate parents and other adults to become informed advocates for better quality and more universally available science, mathematics and technology education in both formal and informal settings; and to encourage them to support their children's science and mathematics endeavors in the home and elsewhere; and,
- to enrich the quality of life by improving the science literacy of children and adults so they are better informed about the implications of science, mathematics, and technology in their everyday lives, motivated to pursue further science and mathematics experiences, and aided in making informed, responsible decisions about science policy issues having societal implications.

Example of an NSF Informational Science Grant

Antarctica and the Global Future

Science Museum of Minnesota
30 East Kent Street
Saint Paul, MN 55101
612-221-9459

David Chittenden

The Science Museum of Minnesota is designing, constructing, and circulating a 5,000 square foot multidisciplinary exhibit to stimulate public interest in Antarctica and to increase understanding of the continent – its physical history, characteristics and geographies, and the approaches and tools and scientists use to help decipher and understand it. Because of the importance of Antarctica in relation to global environmental systems, the exhibit will explore the physical connections between the continent and the rest of the world, as well as some of the scientific, political and economic issues and choices that will affect its future and ours. The exhibit will contain traditional displays of geological, biological and other museum specimens, historical and contemporary photographs, models, dioramas and descriptive text, as well as interactive displays and video. The museum is developing the exhibit in association with the Science Museum Exhibit Collaborative, among whose eight members the exhibit will circulate beginning in the spring of 1991.

AWARD NUMBER: *MDR-8955361*

AMOUNT: *FY90 $574,573*

DISCIPLINE: *Biology; Geology; Environmental sciences*

TARGET AUDIENCE: *General public*

DESCRIPTORS: *Science museums; Exhibits; Traveling exhibits; Collaboration; Antarctica*

Pacific Basin Development Council

This group has funded work in various areas of interest to the aquarium projects. They also are important in communicating the nature of this project to other agencies. A description of the council follows:

The Pacific Basin Development Council (PBDC) is a non-profit, public organization. It was established in early 1980 by the Governors of the three American Territories of American Samoa, Guam, and the Commonwealth of the Northern Marianas Islands, and the State of Hawaii. PBDC is, in effect, an extension of territorial and state governments in the Pacific. PBDC is incorporated under State of Hawaii laws and is headquartered in Honolulu.

PBDC addresses and articulates, through its Board of Directors, the economic and social development concerns of the Pacific Islands. The ultimate goals are job creation and maximum positive impact of the local Island economies.

Economic and social development in the American Pacific must have a multi-discipline base, where each discipline interfaces and interacts with all others so that all parts will improve and support each component. Otherwise, the resulting development in one industrial sector will negatively impact another and the total overall progress for each Island economy might be minimal.

Goals and Purpose

PBDC is the only regional body in the Pacific Basin that addresses a multitude of issues. Through a cooperative effort, it utilizes a large number of private and public sector organizations and individuals in striving to attain its objectives. As outlined in the organization's By-Laws, the purposes of PBDC are:

1. To identify, examine, and assess the economic and social development needs and strategies, and, with particular attention to member entities, articulate the view of the region to the public and private sectors;

2. To provide a research capacity that can address the important issues within the Pacific community;

3. To promote cooperation between the member entities, Federal government, and the private sector in an effort to provide for the comprehensive economic and social development of the Pacific Islands;

4. To collect and disseminate information beneficial to the region;

5. To promote collective action that improves the quality of life for the Pacific Islands and the member entities by addressing their social, economic, and other needs in cooperation with the Federal government and the private sector.

Operations and Projects

Promoting private and public sector interest and understanding of regional issues takes many forms, including:

- Original and secondary research, or providing materials/information for organized research
- Information dissemination through the public and private sectors and media
- Conferences, institutes, study groups, seminars, and lectures

Operational examples of PBDC services are:

- Comprehensive research on techniques, programs, and problems
- Technical assistance for problem resolution to individual members
- Analysis of laws, policies, and programs of the Federal government and informing members about findings
- Working to improve intergovernmental and interregional cooperation
- Holding training sessions, workshops, and seminars for members, as well as the private and public sectors

APPENDIX A

SUMMARY OF COMPARABLE FACILITIES

SUMMARY OF COMPARABLE FACILITIES

Since there are no aquariums on Guam, the general characteristics and operating profiles of existing aquariums found elsewhere are reviewed below. The examples shown range from large aquariums to mid-sized aquariums more typical of the Guam situation.

Industry Overview

Public aquariums, as developed in the United States, are typically non-profit educational facilities. The oldest existing aquarium in the U.S. is San Francisco's Steinhart Aquarium which opened in 1923. This aquarium is actually part of a museum of natural history.

Historically, many zoological institutions have included aquarium components. Freestanding aquarium facilities have been less common and have sometimes had oceanside locations that enabled the utilization of available seawater. Like zoos, aquariums have come a long way since their early years of operation when they were merely a collection of small to medium sized tanks primarily displaying fish.

A new type of facility, the oceanarium, entered the scene after World War II with an emphasis on entertainment provided by performing marine mammals such as killer whales, dolphins and sea lions. An oceanarium typically has several types of shows and is therefore able to charge higher admission prices than an aquarium.

Marine mammal shows have been added by several aquariums (typically a single type of show). This strategy has helped those aquariums stimulate greater public interest, attendance, and revenues. Recently, such shows have received negative response from various scientific and animal rights groups.

The most significant recent trend has been that of presenting marine life in realistic environments that both improves living conditions for the captive animals and also enables

visitors to view them in a more natural setting. Complete miniature ecosystems are often simulated that enable visitors to see the interaction of various life forms. Another important trend is the tailoring of exhibits to a regional ecosystem, as in the case of the Monterey Bay Aquarium, the Aquarium of the Americas in New Orleans, and National Aquarium in Baltimore. This differentiates aquariums from each other and increases the personal involvement of visitors.

In general, aquariums are expensive to construct and to operate. Small aquariums, while less costly than large-scale indoor aquariums, do not achieve the attendance of the larger facilities, resulting in constraints on revenues. Price increases are hard to justify due to the typically short length-of-stay which also limits spending on merchandise, food and beverage. Repeat visitation is not easy to generate due to the difficulty in changing exhibits.

Fortunately, aquariums have not had to generate sufficient revenues to service all debt on funds invested in them. As will be seen in the case studies presented later in this report, construction costs are typically funded by some combination of public funding and private donations. (In the case of the Monterey Bay Aquarium, a private benefactor provided the entire cost of construction.)

General Characteristics of North American Aquariums

Tables 1 and 2 present the key physical and operational characteristics of a number of North American aquariums. All of the surveyed facilities are open seven days a week with the exception of a few major holidays. All the aquariums extend their hours of operation during the summer in order to take advantage of good weather and increased tourism. Length-of-stay is on average two hours. Table 3 illustrates the breakdown of operating expenses for five selected aquariums.

Adult ticket prices range from a low of $3.00 at the Shedd Aquarium to a high of $10.75 at the National Aquarium. The Monterey Aquarium's adult admission price rose to $9.00 in 1991. All of the aquariums offer special ticket prices for students, children and senior citizens.

TABLE 1
GENERAL CHARACTERISTICS OF SELECTED AQUARIUMS, 1991

	Aquarium of the Americas	Monterey Bay Aquarium	Mystic Marine Life Aquarium	National Aquarium	New England Aquarium	New York Aquarium	Seattle Aquarium	Shedd Aquarium	Texas State Aquarium	Vancouver Aquarium
Location	New Orleans, LA	Monterey, CA	Mystic, CT	Baltimore, MD	Boston, MA	Brooklyn, NY	Seattle, WA	Chicago, IL	Corpus Christi, TX	Vancouver, BC
Building Area (S.F.)	110,000	157,000	57,229	143,000	75,000	76,000	67,000	225,000	45,000	77,569
1990 Attendance:										
Total	2,312,422[1]	1,764,000	770,583	1,524,426[3]	1,310,638	717,000	609,000	1,288,966	732,000	959,539
Paid	DNA	1,567,000	360,266[2]	1,370,709[4]	1,138,125	DNA	487,610	838,313	DNA	710,351
Ticket Prices[5]										
Adult	$8.00	$9.00	$8.25	$10.75	$7.50	$5.75	$4.75	$3.00	$7.00	$8.00
Student	NA	$6.50	NA	$8.50	$6.50	$1.75	$2.75	NA	$5.00	$7.00
Child	$4.25	$4.00	$4.75	$6.50	$3.50	$2.00	$2.00	$2.00	$3.75	$5.00
Senior Citizen	$6.25	$6.50	$7.25	$8.50	$6.50	$2.00	$2.75	$2.00	$5.00	$7.00
Number of Members	44,871[6]	77,000	36,000	20,000	11,000	35,000[7]	4,000[6]	15,000[6]	8,500[6]	60,000[6]
Membership Prices:										
Individual	$35	$40	$30	$32	$35	$35	$25	$35	$30	$30
Couple	NA	NA	NA	NA	$45	NA	NA	NA	$40	$44
Family	$59	$49	$40	$63	$55	$50	$35	$45	$50	$52
Marine Mammal Performance	No	No	Yes	Yes	Yes	Yes	No	No[8]	Yes	Yes
Reported Average Length of Stay (hours)	1.5 – 2	2.3 – 3	2 – 2.5	3	2	2.25	1.75	1.5 – 2	1 – 2	2 – 2.25

1/ September 3, 1990 to September 2, 1991 first full year of operation.
2/ Represents paid adult admisions only.
3/ Fiscal Year 1990: July 1, 1989 to June 30, 1990.
4/ Estimate.
5/ Current ticket prices except for the National Aquarium in Baltimore and Shedd Aquarium.
6/ Represents number of memberships.
7/ Represents number of memberships (not individual members) in New York Zoological Society.
8/ Admission prices and building size figures do not include the Oceanarium, which opened April 27, 1991.
Note: DNA means Data Not Available
NA means Not Available

Source: Individual aquariums, and Economics Research Associates

TABLE 2

PRINCIPAL PHYSICAL COMPONENTS OF SELECTED AQUARIUMS

Aquarium	Principal Facilities and Exhibits	Shows
Monterey Bay Aquarium	• 23 major habitat galleries and exhibits • 5,000 specimens • 326,000-gallon shark and native fish tank • Sea otter exhibit • Kelp forest • Tide pool • Touch pool	Formal shows, scheduled feeding and tours.
National Aquarium in Baltimore	• Beluga whale tank • Tropical rain forest • Children's cove • Coral reef • Open ocean tank • Seal pool • Shark tank	A dolphin and beluga whale show has been added recently.
New England Aquarium	• Floating marine mammal pavilion which contains 1,000 seat amphitheater. • 200,000-gallon ocean tank • Coral reef • Tide pool • Boston Harbor	Dolphin and sea lion
Shedd Aquarium	• Coral reef • River otter • Harbor seals • Tributaries (fresh water tanks) • Sea anemones	A dolphin and beluga whale show has been added recently.
New York Aquarium	• Mammal House: Beluga whale holding tank and small exhibits. • 3 pavilions: shark, native sea life-fresh water and Bermuda Triangle	Beluga whale, dolphin and sea lion; walrus; electric eel demonstration; public feeding of sharks, penguins, seals.
Mystic Marinelife Aquarium	• 34 indoor exhibits: major outdoor habitats for harbor seals, sea lions, walruses, elephant seals, etc., marsh area, dolphin and sea lions.	Dolphin and beluga whale.
Seattle Aquarium	• 8 main exhibits • 400,000-gallon "dome" tank • Sea otter exhibit • Touch pool • Coconut crabs • Tropical exhibit • Salmon ladder	Formal shows, scheduled feeding and tours.

Source: Individual aquariums and Economics Research Associates

TABLE 3

BREAKDOWN OF PRINCIPAL OPERATING EXPENSES OF SELECTED AQUARIUMS IN NORTH AMERICA
($ in thousands)

	Monterey, California		Shedd, Chicago		Vancouver, British Columbia		National Aquarium, Baltimore		Seattle Aquarium[1]		Average of Five Aquariums
Attendance (Total)	1,764,000		1,288,966		959,539		1,524,426		629,000		
Building Size (Sq. Ft.)	130,000		225,000		77,569		109,000		67,000		
Administration/Adm. Svcs	$3,552	28.5%	$2,556	26.5%	$719	14.2%	$2,344	23.1%	NA		
Marketing & Fundraising	$1,713	13.7%	$1,553	16.1%	$804	15.9%	$1,948	19.2%	NA		
Curatorial/Plant Operations	$5,005	40.1%	$4,829	50.0%	$2,734	54.0%	$4,132	40.7%	NA		
Education Program/Services	$1,670	13.4%	$720	7.4%	$808[2]	15.9%	$1,626	16.1%	NA		
Research	$530	4.3%	[3]	—	[2]		$92	0.9%	NA		
TOTAL	$12,470	100.0%	$9,658	100.0%	$5,065	100.0%	$10,142	100%	2,520	100%	100%
Expense per Attendee*	$7.07		$7.47		$5.28		$6.65		$4.01		$6.10
Expenses per Square Foot	$54.21		$42.92		$65.29		$93.04		$37.61		$58.61

*Note: Expenses relating to restaurants and book/gifts have not been included.

1/ Seattle Aquarium staff.
2/ Included within education program/services.
3/ None reported separately.

Source: Economics Research Associates

The Aquarium of the Americas has achieved the highest attendance in recent years, 2.3 million during the first operating season. The Monterey Bay Aquarium achieved a near equivalent first year visitation and now attracts about 1.7 million, and the National Aquarium in Baltimore, attracts about 1.4 million. Aquariums typically experience fluctuations in attendance. Generally, attendance drops in the second year of operation following first-year highs. Attendance typically increases with the opening of major new exhibits and decreases when prices are raised. In the United States market attendance also fluctuates on a season basis with higher attendance experienced in the summer months due to established vacation patterns. Attendance magnitudes reflect not only the size and appeal of an individual aquarium, but also the extent and nature of its markets. Attendance is also strong during the spring season, primarily due to attendance by school groups. At most aquariums free admissions represent a part of total attendance, although the ratio varies considerably among different facilities.

Case Study Illustrations in North America

Following are case studies of ten North American aquariums.

Aquarium of the Americas. The Aquarium of the Americas, situated in New Orleans, Louisiana and costing $40 million, opened in September of 1990, and achieved a total attendance of 2,312,422 for its first 12 months of operation. This is the highest annual attendance of the aquariums surveyed, but it must be taken into consideration that attendance tends to be quite high initially, then levels off.

The aquarium's attractions include a Caribbean Reef exhibit with a 132,000 gallon tank which contains a transparent tunnel through which visitors can walk; an Amazon River Basin Exhibit with a 20-foot waterfall, Indian hut and suspension bridge; a Mississippi River Delta exhibit providing a educational message on the vanishing wetlands of Louisiana; and a Gulf of Mexico exhibit containing a half million gallon tank which explores the environmental effects of an oil drilling platform. The total building area is 110,000 square feet.

Admission for adults is presently $8.00, $4.25 for children, and $6.25 for senior citizens. Prices for groups are discounted as low as $6.50 for adults, and $3.50 for children, depending on the size of the group. Groups account for 20% of total visitors, members for 19%, and general admission for 61%. In just over one year, the aquarium has achieved almost 45,000 memberships. Rates for membership are $35 for individuals, and $59 for families.

The nature of the New Orleans tourism market brings visitors from across the country; approximately 69% of the aquarium's visitors are reported to be tourists, or those coming from beyond a 250-mile radius. Many of these, 17.5%, come from other areas of Louisiana, but strong representation has been noted from Texas, Alabama, Florida, California, and from other nations. Officials at the aquarium estimate that visitors stay for an average of 1.5 to 2 hours.

Monterey Bay Aquarium, Monterey, California. The Monterey Bay Aquarium opened in October of 1984 and quickly became the most successful aquarium in the nation in terms of attendance and revenue. The aquarium is a non-profit foundation, active in public education and scientific research, as well as sea life displays. The seven-story state-of-the-art facility was financed by a philanthropist, David Packard, of Hewlett-Packard Company, who donated the entire $55 million in construction costs. The Monterey Bay Aquarium has no bond issues and no loans to repay.

Through its exhibits and habitat galleries, the aquarium presents a regional program depicting the complexities of marine life native to Monterey Bay. Aquarium exhibits include a 335,000-gallon kelp tank and wave simulator; a 326,000-gallon tank recreating a cross-section of the ocean floor in Monterey Bay; a 55,000-gallon sea otter tank; a tidal pool in the actual rock of the bay; a walk through aviary; and touch pools. Altogether, more than 80 habitat tanks exhibit about 5,500 specimens. Constructed partly in a former sardine canning plant, the aquarium retains the architectural feel of Cannery Row. Total occupied site acreage is 2.2 acres.

Until the opening of the Aquarium of the Americas, the Monterey Bay Aquarium, had been achieving the highest attendance of any U.S. aquarium, roughly 1.7 million per year, of which

over 1.5 was paid attendance. The facility is open year-round. Admission prices are $9 for adults, $6.50 for students and senior citizens, and $4 for children aged 3 to 12. Annual memberships are available for $40 for individuals and $49 for families. Average length-of-stay is 2.5 hours.

Initial year attendance totalled 2.22 million visitors. The average party size in 1990 was 3.1 which consisted of 2.4 adults and 0.7 children. The average age of adults was 38 years; children 8.4 years. In the main, the aquarium attracted well educated adult visitors – nearly two-thirds had earned college or post-graduate degrees.

Mystic Marinelife Aquarium, Mystic, Connecticut. The Mystic Marinelife Aquarium was completed in 1973 at a cost of approximately $6 million which was donated by a philanthropist. The facility is owned and operated by Sea Research Foundation, Inc., a tax-exempt, non-profit corporation. The facility is currently planning a $6 million expansion that will be funded by donations. It has also received a $250,000 grant from the State of Connecticut, the only state funds it has ever received.

The original 58,000 square foot facility includes numerous wall tanks, a large central tank for dolphin and sea lion shows, a small gift shop, and a fast-food outlet. In the late 1970s a $2 million expansion was completed consisting of outdoor exhibits including habitats for various types of seals, sea lions and walruses, and a marsh area. Admission prices are $8.25 for adults and $4.75 for children. Annual memberships are $30 for adults and $40 for families. The aquarium is open to the public daily on a year-round basis. Annual attendance is approximately 770,000.

National Aquarium in Baltimore, Baltimore, Maryland. The National Aquarium in Baltimore which opened in 1981 is owned by the City of Baltimore. It is operated by a separate non-profit corporation. Original construction costs were $21.3 million and were mainly provided by city funding. Another $7.5 million was generated by the city's sale of Friendship Airport to the State of Maryland. These funds were applied to construction of the aquarium. Another $7.5 million came

from a general obligation bond issue. An additional $2.5 million came from the U.S. Economic Development Administration. The remainder was provided by private donations.

Major exhibits include a 335,000-gallon Atlantic Coral Reef tank, one of the largest in the U.S., and a 220,000-gallon open ocean tank displaying sharks and other large fish. There are a variety of other exhibits including a rainforest exhibit. The aquarium recently added a new wing containing a major indoor stadium seating 1,300 for marine mammal performances.

Operating year-round, the aquarium charges $10.75 for adults; $8.50 for seniors and children 12 to 18. Children 3 to 11 are charged $6.50. Annual memberships are available for $32 for individuals and $63 for families. Attendance is around 1.4 million annually.

New England Aquarium, Boston, Massachusetts. The New England Aquarium is located in Boston's Inner Harbor. Owned and operated by the New England Aquarium Corporation, a non-profit organization, the facility has been open since 1969. The initial cost of construction was approximately $6 million which was primarily funded by private donations. The aquarium is sustained by gifts, memberships and admissions.

The dominant feature of this aquarium is a 200,000-gallon cylindrical tank in the center of the building containing a man-made, three-story tall, Caribbean coral reef and 500 specimens of 64 salt water fish species. At the base of the tank is a rectangular basin that holds three species of penguins. Its contents may be viewed from windows along a spiral ramp that circles the tank from top to bottom. At each level, corridors lead away from the tank to galleries containing smaller wall tanks. Visitor facilities include a small gift shop and food and beverage outlets.

In 1975, construction of a 1,000-seat amphitheater with a 110,000-gallon tank for performing marine mammals was completed. Base admission prices are $7.50 for adults, $3.50 for children 5 to 15 years, and free for children under 5 years of age. Special rates are available for groups.

Seattle Aquarium. The Seattle Aquarium, in Seattle, Washington, offers both indoor and outdoor marine exhibits, including underwater viewing rooms, touch tank, fish ladder, and naturalistic marshy tidelands and rocky coastlines. Total building area is approximately 67,000 square feet.

Admission charged at the Seattle Aquarium is $4.75 for adults, $2.75 for students and senior citizens, and $2 for children. Total attendance for 1990 was an estimated 609,000, with paid attendance of 487,600. Group attendance accounted for 10% of the total; memberships totalled 4,000.

Sixty percent of visitors to the aquarium originate from beyond the local area, or more than 50 miles away, while 22% come from the city of Seattle, and the remainder from the rest of the local area. Visitors remain in the aquarium for an average of 1.75 hours.

Shedd Aquarium, Chicago, Illinois. Opened to the public in 1930, the Shedd Aquarium is an older style facility with a large number of small tanks, plus a medium-sized coral reef tank (90,000 gallons) which was later added in the building's central rotunda. More than 5,000 specimens representing 560 species are on display at the Shedd Aquarium.

Admission prices are low: $3 for adults, $2 for children and $0.50 for seniors. Total annual attendance is around 932,000, with free admissions comprising between 35% and 40% of the total. The low admission prices reflect a sizable annual operating subsidy from the City of Chicago. The aquarium is operated by a non-profit society.

The Shedd Aquarium recently completed a major addition housing a marine mammal performance stadium and very large tanks for marine mammals with underwater viewing areas and related exhibits. A separate admission is charged for entry to the new wing, and includes the marine mammal performance. The new wing cost approximately $43 million. The Shedd conducted a capital campaign to raise $25 million from the corporate community and individual donations. The State and the Chicago Park District each contributed $5 million.

Texas State Aquarium. The Texas State Aquarium, located in Corpus Christi, opened its doors in July of 1990. The exhibits contain more than 250 species of sea life in over 350,000 gallons of water. Exhibits include an artificial reef created from the base of an oil rig; a Gulf of Mexico "Flower Gardens Coral Reef;" a barrier islands interactive exhibit which makes the viewer the Mayor of a Gulf Coast city responsible for issuing evacuation orders during a hurricane watch; the "Ship's Laboratory" interactive exhibit, which provides a journey into space via a weather satellite station; a wet lab which provides a view of the latest marine technology and the future of fish and shrimp farming. The building comprises 45,000 square feet.

Admission fees are currently $7 for adults, $5 for students and senior citizens, and $3.75 for children. Total attendance for the first year of operation was 732,000. The Aquarium has 8,500 memberships, which cost $30 for individuals, $40 for couples, and $50 for families.

Approximately 20% of the visitors to the new aquarium come from the Corpus Christi area, while the remaining 80% originate primarily from other parts of Texas. Visitors stay for an average of 1 to 2 hours.

Vancouver Aquarium, Vancouver, British Columbia. The Vancouver Aquarium features two main exhibit themes: the Tropical Regions and The Waters of British Columbia. The aquarium also features live performances by killer whales, beluga whales and dolphins. The Vancouver Aquarium is the only aquarium in North America which has a killer whale show, the most popular of all marine mammal shows. Other major exhibits at the Vancouver Aquarium include a new Arctic Canada exhibit which explores animals and habitats in the Canadian high arctic, reputed to contain the world's finest Beluga whale habitat. Other new exhibits include the Sea Otter Habitat and the British Columbia Sugar Harbour Seal Habitat. The building area totals 60,000 square feet.

Admission fees are presently $8 for adults, $7 for students and senior citizens, and $5 for children. Annual attendance in 1990 amounted to 959,540, with 710,350 paid. The aquarium has 23,000 memberships, covering approximately 60,000 persons.

Visitation is comprised of 72% tourists, with a higher percentage of tourists during the summer (79%). Approximately 50% of the tourists are from Canada. Average length of stay is approximately 2 to 2.5 hours.

Revenue and Income Summary

Table 4 presents a summary of revenues and other income sources for selected North American aquariums.

Other Aquariums and Oceanariums

Ocean Park, HongKong. Ocean Park is only 20 minutes from the heart of HongKong Island and about 30 minutes from downtown Kowloon. It is a unique multi-faceted attraction. It offers visitors dramatic aerial tram rides with breathtaking views, a 3,500-seat ocean theater in which marine mammals perform, a spectacular 433,000-gallon atoll reef aquarium that is 23 feet deep, a 350,000-gallon wave cove in which sea lions, seals, and penguins are exhibited, a four-section aviary exhibiting many species of birds, a flamingo and parrot gardens and a bird theater for various kinds of performances. In addition, Ocean Park contains a world class water park with a large surfing pool and several types of water slides and play pools. Complementing those attractions are an assortment of modern amusement rides – loop roller coasters, a wild waters ride, a Viking swing ride, a Ferris wheel and others. The most recent addition has been a cultural attraction called the Middle Kingdom. It offers park guests a walk through 5,000 years of ancient China history.

Ocean Park, which has reasonably high admission prices, $20 for adults and $10 for children, drew about 2.4 million visitors in 1991, 400,000 of whom went only to the water park. Of the two

TABLE 4
INCOME BY SOURCE AT SELECTED AQUARIUMS
($ in thousands)

	Monterey 1989	New York 1989	Shedd 1990	Baltimore 1990	Vancouver 1990	Total	Percent of Revenue
REVENUES							
Admissions	$8,915	$1,664	$2,244	$8,632	$4,314	$25,769	78%
Gift/Bookstore Sales[1]	$1,616	$465	$684	$755	$1,344	$4,864	15%
Restaurant[2]	$143	$658				$801	2%
Special Groups	$434			$577		$1,011	3%
Ed. Program			$219			$219	—
Other	$422	$362[3]	$59			$843	3%
Total Revenues	$11,530	$3,149	$3,206	$9,964	$5,658	$33,507	100%
OTHER INCOME							
Individual Memberships & Contributions	$1,258	$2.928	$13,891	$8,398	$638		
Government							
Business Contributions	$243						
Income from Investments & Other	$4,008			$729	$465		
TOTAL SUPPORT	$5,509	$2,928[4]	$13,991	$9,115	$1,103	$32,646	
TOTAL REVENUE AND SUPPORT	$17,039	$6,077	$17,197	$19,079	$6,761	$66,153	

1/ Net income from operations or percentage of gross revenues from concessionaire.
2/ Net from private restaurant concessionaire.
3/ Parking revenues.
4/ Combination of contributions, government subsidy, membership dues, endowment and investment income.

Source: Economics Research Associates

million or so admissions to the Ocean Park, about 1.5 million were HongKong residents and 0.5 million were tourists visiting HongKong. Of the latter, an estimated 150,000 were visitors from Taiwan. Since total visitation from Taiwan was around 1.3 million, Ocean Park captured approximately 11.5% of that visitor market. That compares with approximately 7.6% for the remaining foreign visitor market. This higher capture rate suggests a somewhat greater propensity of Taiwan residents to be attracted to this type of installation.

Osaka Aquarium. The Osaka Aquarium occupies an eight-story structure in Osaka's harbor area. It is part of a mixed-use visitor complex that includes a major retail center featuring fashion boutiques, restaurants, specialty food courts, night clubs, discotheques, and bay cruises on an oversized replica of the Santa Maria. It has excellent regional and local access by private and public transportation.

The aquarium exhibits take visitors on a tour of the Pacific Rim, thus its name, the Osaka Aquarium Ring of Fire. Accordingly, exhibits feature marine life found in such places as the Aleutian Islands, the coasts of California and Chile, Antarctica, the Australian Great Barrier Reef, and the Japanese Deeps. The visitor passes through these zones in a sequential clockwise fashion, starting and ending at exhibits associated with Japan.

The Osaka Aquarium opened in July of 1990. Since then it has become the world champion performer in terms of generating attendance, approximately 5.18 million during its first full year of operation. In one record month, August of 1990, the aquarium attracted a reported 817,000 visitors. It recorded its seven millionth visitor on December 5, 1991, which suggests that second year attendance is holding at an average of about 400,000 visitors per month, which is almost comparable to its first year monthly average visitation. This very high attendance can probably be explained by the massive population residing within 100 miles of the aquarium, 32 million people, and the large scope and high quality of the facility itself.

The Osaka Aquarium's admission fees are also among the most expensive in the world – $15.60 for adults, $7.20 for school aged children, and $3.20 for children aged 4 to 6. Modest discounts are offered to groups.

Other Aquariums in Japan

Japan has numerous aquariums that vary in scope from fairly small to facilities comparable to several of the U.S. aquariums discussed above. The general characteristics of several top aquarium facilities in Japan are presented in Table 5. Although the attendance data is somewhat dated (1986) it nevertheless provides a general overview of Japanese aquariums. It should be noted that virtually all the more notable aquariums in Japan, other than the Osaka Aquarium, are associated with leisure destination areas and present marine mammal shows for entertainment purposes. Most of these aquariums are privately owned and were originally built as for-profit ventures.

TABLE 5

GENERAL CHARACTERISTICS OF SELECTED JAPANESE AQUARIUMS

Name	Management	Floor Area (sq. Meters)	Total Annual Attendance (million)	Facilities	Location	Entertainment Features	Access
Toba Aquarium	Private; Toba Aquarium Co. Ltd.	6,600	1.5 – 2.0	Single facility for museum	Beaches, sightseeing, leisure resort	Sea otters, other sea animals	Good
Sunshine Tokyo	Private; Toshi Kaibatou Center	5,665	1.0 – 1.5	Large multiple facilities, shops, exhibit hall, hotel, planetarium	Large city	Sea otters, Pacific dolphins, sea lions, sea show (indoor)	Excellent
Izu Mito Sea Paradise	Private; Izu Makone Railroad	16,166	0.75 – 1.0	Miltiple facilities for museum	Beaches, sightseeing, leisure resort	Sea otters, pool show (indoor), originator of sea animal training	Good
Okinawa Marine Exposition Memorial Park Aquarium	Public-National Government, Memorial Park Management Foundation	28,100	0.75 – 1.0	Marine Exhibition Authority Facility (multiple facilities for museum)	Beaches, sightseeing, leisure resort	White sharks, dolphin show, dolphin studio, Okityan Theater	Poor
Sume Aquarium[1] Kobe	Public-Kobe City Economic office	22,300	0.5 – 0.75	Multiple facilities for museum	Beaches, sightseeing, leisure resort	Sea animal show, film theater, sharks	Excellent
Matsushima Aquarium	Private, Sendai Kyuke	7,438	0.75 – 1.0	Multiple facilities for museum (amusement park)	Beaches, sightseeing, leisure resort	Sea otters, exhibition tank environmental shows (Jungle Park)	Good
Marine Palace	Private, Marine Palace, Oita Prefecture, Beppu City	5,073	0.5 – 0.75	Single facility for museum	Beaches, sightseeing, leisure resort	Large tidal flow tank (world's first), circumference fish show (61m)	Good

1/ 1986 data.

Source: Japan Zoo and Aquarium Associates

APPENDIX B

FIVE YEAR PROFORMA

FIVE YEAR PROFORMA

Appendix B presents a 5-year proforma for aquarium operations. It is in the form of 10 tables. To make the discussion easier to follow, the row and column designations on the spreadsheets have been displayed to provide reference points.

Table B-1 is adapted from Table 5-28 with some "rounding". It is based on the best estimates for a Normalized Year. That is to say, a typical year once the operations have settled down following initial opening and its associated heightened interest and attendance.

Table B-2 spreads the normalized year of Table B-1 across the first 5 full years of operation. Year 2000, the first normal year, is identical to the year shown on Table B-1. The Opening Year has a attendance 15% higher than the Normalized Year. The second year is 7.5% higher. Year 4 is 5% higher than the Normalized Year reflecting the projected gain in tourist activity. Year 5 is 5% higher than Year 4.

The net operating income reflects the attendance changes

Dollar values are not inflated.

To reflect a higher marketing effort in the first year, $300,000 has been added to that expense item for one year only.

The planning defines two different levels of initial construction, A Core Facility and a Full Facility. Table B-2 applies to the the Full Facility . Attendance is assumed to be the same in either instance. This reflects the belief that the Core Facility will capture virtually the same attendance as the Full Facility for the first few years. This is discussed in Section 5. If the facility were further reduced in scale, we believe that attendance would suffer.

Table B-3 is the same as Table B-2 except it is for a Core Facility. The operating expenses are reduce by 5% from the Full Facility.

Table B-4 inflates operating income by the factors shown for the Core Facility and the Full Facility.

Table B-5 develops values illustrating how the project may be funded for the Full Facility. Here (Row 149) an extra contingency (10%) is added to the Capital costs to reflect uncertainties in inflation and timing. We could call this a financing safety factor.

We then assume a series of factors that can help define how much could be raised by selling bonds to meet capital costs by using the net operating income. In this instance, several assumptions are made:

- Assuming the bonds are sold by the Government of Guam through GEDA, they will be "Tax-Free", so a 6.5% interest rate is assumed.
- A 25 year life is assumed.

- A "Minimum Coverage" factor of 40% is assumed. This is a way of saying that we will assume that 40% of "Net Operating Revenues" or more will be put in to a reserve and not used to pay off the bonds that year. (The other 60% will be used for bond redemption.) This device is appropriate to true revenue bonds. These aren't such bonds[1] but the use of such a device to establish reserves is appropriate to the situation.

The net result is to suggest that up to $24,300,000 in revenue bonds could be issued (Row 159).

Other Funding Assumptions are illustrated more or less along the lines described in the text. The point to keep in mind is that a total of almost $20 million would be required from other sources to finance the Full Facility.[2] The relative values reflect some thought as to an appropriate distribution.

Finally, the building of a reserve is illustrated on Rows 176-180. This says that, based on these assumptions over $10 million (Box H180) would be collected that can be used for any purpose.[3]

Table B-6 is similar to Table B-5 but for the Core Facility. Here the "Other Funding" amount is reduced significantly (54%) because the project is smaller and the available "Revenue Bond Funds" are larger.[4]

Here too, a reserve would be built up to almost $11 million (Box H219). In this case, one could use that money to complete the Core Facility into the Full Facility.

Table B-7 (along with Tables B-8 through B-10) attempt to answer the question "What happens if attendance is less than projected?" Through iteration we have determined that if the "Normalized Attendance" for a Core Facility drops 15% below projections, then the Coverage (Row 329) would be "0%" if all other factors were the same. If this were to happen then the "Other Funding" sources would have to be modified upward and/or the reserve would not support completion of the Full Facility.

---

[1] They are GO bonds supported by dedicated revenues but guaranteed by the issuing agency.

[2] It is probably fair to say that this is why the schedule suggest 9 months are required to arrange financing. Further, it clearly makes the case that admission revenues alone will not pay to construct this project.

[3] If it were used to pay off the revenue bonds they could be retired in 10-15 years rather than 25.

[4] This is a product of the assumptions that (1) the attendance will be about the same for the first 5 years for either the Full or Core Facility; and (2) the operating cost will be a little less for the smaller facility.

There is an infinite variety of assumptions that can be tested with these Tables and these are only presented as starting points. However, these initial conclusions can be drawn from this information:

- There seems little financial reason to go beyond the Core Facility as the initial project. It will draw the attendance and future expansion is probably within reach.

- Sources of funding other than bonds based on revenues are necessary for the initial construction costs. In the case of the Core Facility, these are probably within reach but it will take a significant effort.

- If attendance does not reach the objectives projected, it may be necessary to increase funding from other tax sources. It may well be, especially in the case of the Hotel Attraction Funds (or some form of tax on tours) that a linkage between low attendance and higher taxes would insure a maximum aquarium promotion effort by the tourism industry.

This discussion differs somewhat from that presented in Section 5. This is a reflection of how different project governance options (private versus public) could influence financing.

	A	B	C	D	E	F	G	H
1								
2					**TABLE B-1**			
3								
4	5 Year Operating Proforma							
5	Normalized Year							
6	Based on Stage 3 Report, Table 5-28							
7	1992 Values							
8	Attendance Assumes Either Core Facility or Full Facility							
9	Operating Cost Assumes Full Facility							
10			Core Facility Operating Costs would be 5% less.					
11					Normalized			
12					Year			
13								
14	Attendance				475,000			
15	Average Admission Revenue				$12.55			
16								
17	Operating Revenues							
18								
19	Admissions				$5,961,000			
20			Book Store Sales	$2,280,000		Note 1		
21			Book Store Cost of Goods	($912,000)		Note 2		
22	Net Book Store Revenues				$1,368,000			
23	Net Food Service Concession Revenues				$47,000	Note 3		
24			Misc. Other Revenues	$894,000		Note 4		
25			Less Cost of Goods Sold	($357,000)		Note 2		
26	Net Other Revenues				$536,000			
27								
28			Total Operating Revenues		$7,912,000			
29								
30	Operating Expenses							
31								
32	Administration				$1,325,000			
33	Marketing and Fundraising				$795,000			
34	Curatorial/Plant Operations				$2,385,000			
35	Educational Program Services				$795,000			
36								
37			Total Operating Expenses		$5,300,000			
38								
39	Net Operating Income				$2,612,000			
40								
41	Operating Revenue Notes							
42								
43	1.		Assumes $4.80 per capita					
44	2.		Assumes Cost of Goods is 40% of Sale Price					
45	3.		Assumes $2.00 per capita Gross with 5% Being Revenue to Aquarium					
46	4.		Assumes 15% of Admissions					
47								
48								

	A	B	C	D	E	F	G	H
49								
50				**TABLE B-2**				
51								
52	5 Year Operating Proforma for Full Facility							
53	$1992 Values - With No Escalation							
54	Attendance Assumes Either Core Facility or Full Facility, adjusted							
55	for normal variation in initial attendance patterns.							
56	Operating Costs Assume Full Facility with $300,000 added Initial Marketing Costs							
57								
58	Operating Year			1	2	3	4	5
59	Calendar Year			1998	1999	2000	2001	2002
60	Type of Year			Opening	2nd	Normalized	4th	5th
61								
62	Attendance			546,000	510,000	475,000	498,000	523,000
63	Average Admission Revenue			$12.55	$12.55	$12.55	$12.55	$12.55
64								
65	Operating Revenues							
66								
67	Admissions			$6,852,000	$6,400,000	$5,961,000	$6,249,000	$6,563,000
68	Net Book Store Revenues			$1,572,000	$1,468,000	$1,368,000	$1,434,000	$1,506,000
69	Net Food Service Concession Revenue			$54,000	$51,000	$47,000	$49,000	$52,000
70	Net Other Revenues			$616,000	$576,000	$536,000	$562,000	$590,000
71								
72	Total Operating Revenues			$9,094,000	$8,495,000	$7,912,000	$8,294,000	$8,711,000
73								
74	Operating Expenses							
75								
76	Administration			$1,325,000	$1,325,000	$1,325,000	$1,325,000	$1,325,000
77	Marketing and Fundraising			$1,095,000	$795,000	$795,000	$795,000	$795,000
78	Curatorial/Plant Operations			$2,385,000	$2,385,000	$2,385,000	$2,385,000	$2,385,000
79	Educational Program Services			$795,000	$795,000	$795,000	$795,000	$795,000
80								
81	Total Operating Expenses			$5,600,000	$5,300,000	$5,300,000	$5,300,000	$5,300,000
82								
83	Net Operating Income			$3,494,000	$3,195,000	$2,612,000	$2,994,000	$3,411,000
84								

	A	B	C	D	E	F	G	H
85								
86					**TABLE B-3**			
87								
88	5 Year Operating Proforma for Core Facility							
89	Assumes 1998 to be first year of operation							
90	$1992 Values - With No Escalation							
91	Attendance Assumes Either Core Facility or Full Facility, adjusted							
92	for normal variation in initial attendance patterns.							
93	Operating Costs Assume Core Facility (5% less than Full Facility)							
94								
95	Operating Year			1	2	3	4	5
96	Calendar Year			1998	1999	2000	2001	2002
97	Type of Year			Opening	2nd	Normalized	4th	5th
98								
99	Attendance			546,000	510,000	475,000	498,000	523,000
100	Average Admission Revenue			$12.55	$12.55	$12.55	$12.55	$12.55
101								
102	Operating Revenues							
103								
104	Admissions			$6,852,000	$6,400,000	$5,961,000	$6,249,000	$6,563,000
105	Net Book Store Revenues			$1,572,000	$1,468,000	$1,368,000	$1,434,000	$1,506,000
106	Net Food Service Concession Revenue			$54,000	$51,000	$47,000	$49,000	$52,000
107	Net Other Revenues			$616,000	$576,000	$536,000	$562,000	$590,000
108								
109	Total Operating Revenues			$9,094,000	$8,495,000	$7,912,000	$8,294,000	$8,711,000
110								
111	Operating Expenses							
112								
113	Administration			$1,258,000	$1,258,000	$1,258,000	$1,258,000	$1,258,000
114	Marketing and Fundraising			$1,040,000	$755,000	$755,000	$755,000	$755,000
115	Curatorial/Plant Operations			$2,265,000	$2,265,000	$2,265,000	$2,265,000	$2,265,000
116	Educational Program Services			$755,000	$755,000	$755,000	$755,000	$755,000
117								
118	Total Operating Expenses			$5,318,000	$5,033,000	$5,033,000	$5,033,000	$5,033,000
119								
120	Net Operating Income			$3,776,000	$3,462,000	$2,879,000	$3,261,000	$3,678,000

	A	B	C	D	E	F	G	H
121								
122				**TABLE B-4**				
123								
124	Net Operating Income (Full and Core Facility)							
125	Adjusted for 3.5% Inflation (starting 1993) of both Revenues and Expenses							
126								
127	For Full Facility			Total	Total	Net	Inflation	Net
128				Operating	Operating	Operating	Factor	Operating
129				Revenues	Expenses	Income	at	Income
130			Year	Non-Inflated	Non-Inflated	Non-Inflated	3.5%	Inflated
131								
132			1998	$9,094,000	$5,600,000	$3,494,000	118.8%	$4,149,000
133			1999	$8,495,000	$5,300,000	$3,195,000	122.9%	$3,927,000
134			2000	$7,912,000	$5,300,000	$2,612,000	127.2%	$3,323,000
135			2001	$8,294,000	$5,300,000	$2,994,000	131.7%	$3,942,000
136			2002	$8,711,000	$5,300,000	$3,411,000	136.3%	$4,648,000
137								
138								
139	For Core Facility			Total	Total	Net	Inflation	Net
140				Operating	Operating	Operating	Factor	Operating
141				Revenues	Expenses	Income	at	Income
142			Year	Non-Inflated	Non-Inflated	Non-Inflated	3.5%	Inflated
143								
144			1998	$9,094,000	$5,318,000	$3,776,000	118.8%	$4,484,000
145			1999	$8,495,000	$5,033,000	$3,462,000	122.9%	$4,255,000
146			2000	$7,912,000	$5,033,000	$2,879,000	127.2%	$3,662,000
147			2001	$8,294,000	$5,033,000	$3,261,000	131.7%	$4,294,000
148			2002	$8,711,000	$5,033,000	$3,678,000	136.3%	$5,012,000
149								
150								

	A	B	C	D	E	F	G	H
151								
152					**TABLE B-5**			
153								
154	Financing Strategy Calculations Assuming Revenue Based (GO) Bond Issue							
155	Calculation Assuming Full Facility							
156								
157			Capital Costs Allowance					
158			Capital Cost for Program		$40,000,000			
159			Planning/Inflation Contingency (10%)		$4,000,000			
160			Total			$44,000,000		
161								
162			Revenue Based (GO) Bond Issue Capability					
163			Life of Bonds in Years		25			
164			Assumed Interest Rate		6.50%			
165			Net Operating Income		$3,323,000			
166			Minimum Coverage		40%			
167			Funds for Bond Redemption		$1,993,800			
168			Bond Factor		0.0820			
169			Capacity for Bond Issue			$24,300,000		
170								
171			Other Funding Assumptions					
172			Federal Funds for Infrastructure		$4,000,000			
173			Private Fund Raising & Sponsorship		$5,000,000			
174			GO Bonds or Other GovGuam Contribution		$3,100,000			
175			Bonds Based on Tourist Attraction Funds		$7,100,000		$582,069	/Year
176			Other Participation		$500,000			
177			Other Funding			$19,700,000		
178								
179			Total Funding			$44,000,000		
180								
181	Reserve Accumulation-Full Facility							
182	First Five Years							
183				Remaining Bond	Interest	Payment	Net Oper.	Reserve	Cuml.
184	Cal.	Yr		Principal			Income		Reserve
185									
186	1998	1		$24,300,000	$1,579,500	$1,993,800	$4,149,000	$2,155,200	$2,155,200
187	1999	2		$23,885,700	$1,552,571	$1,993,800	$3,927,000	$1,933,200	$4,088,400
188	2000	3		$23,444,471	$1,523,891	$1,993,800	$3,323,000	$1,329,200	$5,417,600
189	2001	4		$22,974,561	$1,493,346	$1,993,800	$3,942,000	$1,948,200	$7,365,800
190	2002	5		$22,474,108	$1,460,817	$1,993,800	$4,648,000	$2,654,200	$10,020,000
191									

	A	B	C	D	E	F	G	H
192								
193					**TABLE B-6**			
194								
195	Financing Strategy Calculations Assuming Revenue Based (GO) Bond Issue							
196	Calculation Assuming Core Facility							
197								
198			Capital Costs Allowance					
199			Capital Cost for Program		$32,000,000			
200			Planning/Inflation Contingency (10%)		$3,200,000			
201			Total			$35,200,000		
202								
203			Revenue Based (GO) Bond Issue Capability					
204			Life of Bonds in Years		25			
205			Assumed Interest Rate		6.50%			
206			Net Operating Income		$3,662,000			
207			Minimum Coverage		40%			
208			Funds for Bond Redemption		$2,197,200			
209			Bond Factor		0.0820			
210			Capacity for Bond Issue			$26,800,000		
211								
212			Other Funding Assumptions					
213			Federal Funds for Infrastructure		$3,000,000			
214			Private Fund Raising & Sponsorship		$1,700,000			
215			GO Bonds or Other GovGuam Contribution		$1,200,000			
216			Bonds Based on Tourist Attraction Funds		$2,500,000		$204,954	/Year
217			Other Participation		$200,000			
218			Other Funding			$8,600,000		
219								
220			Total Funding			$35,400,000		
221								
222	Reserve Accumulation-Core Facility							
223	First Five Years							
224				Remaining Bond	Interest	Payment	Net Oper.	Reserve	Cuml.
225	Cal.	Yr		Principal			Income		Reserve
226									
227	1998	1		$26,800,000	$1,742,000	$2,197,200	$4,484,000	$2,286,800	$2,286,800
228	1999	2		$26,344,800	$1,712,412	$2,197,200	$4,255,000	$2,057,800	$4,344,600
229	2000	3		$25,860,012	$1,680,901	$2,197,200	$3,662,000	$1,464,800	$5,809,400
230	2001	4		$25,343,713	$1,647,341	$2,197,200	$4,294,000	$2,096,800	$7,906,200
231	2002	5		$24,793,854	$1,611,601	$2,197,200	$5,012,000	$2,814,800	$10,721,000

	A	B	C	D	E	F	G	H
232								
233					**TABLE B-7**			
234								
235	5 Year Operating Proforma							
236	Normalized Year							
237	Assumes Attendance Reduced by approximately 70,000/yr							
238	1992 Values							
239	Attendance Assumes Either Core Facility or Full Facility							
240	Operating Cost Assumes Full Facility							
241			Core Facility Operating Costs would be 5% less.					
242					Normalized			
243					Year			
244								
245	Attendance				406,000		85%	Table A
246	Average Admission Revenue				$12.55			
247								
248	Operating Revenues							
249								
250	Admissions				$5,095,000			
251			Book Store Sales	$1,948,000		Note 1		
252			Book Store Cost of Goods	($779,000)		Note 2		
253	Net Book Store Revenues				$1,169,000			
254	Net Food Service Concession Revenue				$40,000	Note 3		
255			Misc. Other Revenues	$764,000		Note 4		
256			Less Cost of Goods Sold	($305,000)		Note 2		
257	Net Other Revenues				$458,000			
258								
259			Total Operating Revenues		$6,762,000			
260								
261	Operating Expenses							
262								
263	Administration				$1,325,000			
264	Marketing and Fundraising				$795,000			
265	Curatorial/Plant Operations				$2,385,000			
266	Educational Program Services				$795,000			
267								
268			Total Operating Expenses		$5,300,000			
269								
270	Net Operating Income				$1,462,000			
271								
272	Operating Revenue Notes							
273								
274	1.		Assumes $4.80 per capita					
275	2.		Assumes Cost of Goods is 40% of Sale Price					
276	3.		Assumes $2.00 per capita Gross with 5% Being Revenue to Aquarium					
277	4.		Assumes 15% of Admissions					
278								
279								

	A	B	C	D	E	F	G	H
280								
281				**TABLE B-8**				
282								
283	5 Year Operating Proforma for Core Facility							
284	Assumes 1998 to be first year of operation							
285	Assumes Attendance Reduced by approximately 70,000/yr							
286	Attendance Assumes Either Core Facility or Full Facility, adjusted							
287	for normal variation in initial attendance patterns.							
288	Operating Costs Assume Core Facility (5% less than Full Facility)							
289								
290	Operating Year			1	2	3	4	5
291	Calendar Year			1998	1999	2000	2001	2002
292	Type of Year			Opening	2nd	Normalized	4th	5th
293								
294	Attendance			466,000	436,000	406,000	426,000	447,000
295	Average Admission Revenue			$12.55	$12.55	$12.55	$12.55	$12.55
296								
297	Operating Revenues							
298								
299	Admissions			$5,848,000	$5,471,000	$5,095,000	$5,346,000	$5,609,000
300	Net Book Store Revenues			$1,342,000	$1,255,000	$1,169,000	$1,226,000	$1,287,000
301	Net Food Service Concession Revenue			$46,000	$43,000	$40,000	$42,000	$44,000
302	Net Other Revenues			$526,000	$492,000	$458,000	$481,000	$504,000
303								
304	Total Operating Revenues			$7,762,000	$7,261,000	$6,762,000	$7,095,000	$7,444,000
305								
306	Operating Expenses							
307								
308	Administration			$1,258,000	$1,258,000	$1,258,000	$1,258,000	$1,258,000
309	Marketing and Fundraising			$1,040,000	$755,000	$755,000	$755,000	$755,000
310	Curatorial/Plant Operations			$2,265,000	$2,265,000	$2,265,000	$2,265,000	$2,265,000
311	Educational Program Services			$755,000	$755,000	$755,000	$755,000	$755,000
312								
313	Total Operating Expenses			$5,318,000	$5,033,000	$5,033,000	$5,033,000	$5,033,000
314								
315	Net Operating Income			$2,444,000	$2,228,000	$1,729,000	$2,062,000	$2,411,000

	A	B	C	D	E	F	G	H
316								
317				**TABLE B-9**				
318								
319	Net Operating Income (Core Facility)							
320	Adjusted for 3.5% Inflation (starting 1993) of both Revenues and Expenses							
321	Assumes Attendance Reduced by approximately 70,000/yr							
322				Total	Total	Net	Inflation	Net
323				Operating	Operating	Operating	Factor	Operating
324				Revenues	Expenses	Income	at	Income
325			Year	Non-Inflated	Non-Inflated	Non-Inflated	3.5%	Inflated
326								
327			1998	$7,762,000	$5,318,000	$2,444,000	118.8%	$2,902,000
328			1999	$7,261,000	$5,033,000	$2,228,000	122.9%	$2,738,000
329			2000	$6,762,000	$5,033,000	$1,729,000	127.2%	$2,199,000
330			2001	$7,095,000	$5,033,000	$2,062,000	131.7%	$2,715,000
331			2002	$7,444,000	$5,033,000	$2,411,000	136.3%	$3,285,000
332								
333								

	A	B	C	D	E	F	G	H
334								
335					**TABLE B-10**			
336								
337	Financing Strategy Calculations Assuming Revenue Based (GO) Bond Issue							
338	Calculation Assuming Core Facility							
339	Assumes Attendance Reduced by approximately 70,000/yr							
340		Capital Costs Allowance						
341			Capital Cost for Program		$32,000,000			
342			Planning/Inflation Contengency (10%)		$3,200,000			
343			Total			$35,200,000		
344								
345		Revenue Based (GO) Bond Issue Capability						
346			Life of Bonds in Years		25			
347			Assumed Interest Rate		6.50%			
348			Net Operating Income		$2,199,000			
349			Minimum Coverage		0%			
350			Funds for Bond Redemption		$2,199,000			
351			Bond Factor		0.0820			
352			Capacity for Bond Issue			$26,800,000		
353								
354		Other Funding Assumptions						
355			Federal Funds for Infrastructure		$3,000,000			
356			Private Fund Raising & Sponsorship		$1,700,000			
357			GO Bonds or Other GovGuam Contribution		$1,200,000			
358			Bonds Based on Tourist Attraction Funds		$2,500,000		$204,954	/Year
359			Other Participation		$200,000			
360			Other Funding			$8,600,000		
361								
362		Total Funding				$35,400,000		
363								
364	Reserve Accumulation-Core Facility							
365	First Five Years							
366				Remaining Bond	Interest	Payment	Net Oper.	Reserve	Cuml.
367	Cal.	Yr		Principal			Income		Reserve
368									
369	1998	1		$26,800,000	$1,742,000	$2,199,000	$2,902,000	$703,000	$703,000
370	1999	2		$26,343,000	$1,712,295	$2,199,000	$2,738,000	$539,000	$1,242,000
371	2000	3		$25,856,295	$1,680,659	$2,199,000	$2,199,000	$0	$1,242,000
372	2001	4		$25,337,954	$1,646,967	$2,199,000	$2,715,000	$516,000	$1,758,000
373	2002	5		$24,785,921	$1,611,085	$2,199,000	$3,285,000	$1,086,000	$2,844,000