

**A REPORT TO THE NWRI AD HOC WORKING GROUP TO
DETERMINE THE VIABILITY OF INITIATING AN
ORGANIZATION TO FACILITATE TECHNOLOGY TRANSFER
OF RESEARCH RESULTS TO THE MARKET PLACE**

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BACKGROUND

At its June meeting, the Ad Hoc Working Group of the National Water Research Institute (NWRI) directed the Executive Director to examine three alternative strategies of how to facilitate technology transfer of NWRI's research results to the market place. The purpose of this examination is predicated upon the future needs of NWRI for financial resources to maintain and grow its research programs .

The first strategy was to consider NWRI as the agent of such transfers. This was not a viable option inasmuch as NWRI's **non-profit** status precludes it from engaging in ventures considered by the IRS as **for-profit**.

The second strategy would be to engage the services of a third party experienced in the technology transfer of water-related intellectual properties to the market place. This option was investigated, and the following findings were determined from interviews with five technology-related venture capital companies.

A third strategy would be to create a for-profit organization to serve as a vehicle for stimulating the transfer of water-related intellectual properties to the market place. Although the organization would be independent and not related to NWRI, it would provide a means to enhance future financial needs of NWRI's research programs.

EXISTING TECHNOLOGY TRANSFER COMPANIES

ARCH Venture Partners (AVP)

This company had its origin in 1986 when the Argonne National Laboratories and the University of Chicago Development Corporation (ARCH) joined forces to create an entity to explore the commercialization of their jointly developed technologies. They recognized in 1994 that a non-profit status was hindering their growth and created ARCH Venture Partners. Today, AVP has offices at the University of Chicago, Argonne National Laboratory, Columbia University, SANDIA, and near the University of Washington.

AVP is a classic venture company. Capital raised is invested in emerging technologies; their current fund raising is at the \$100 million level. New companies are created by syndication and limited partnerships.

AVP has been responsible for the startup of 31 different companies representing 31 patents; 26 companies are still viable. They deal mainly with universities and retain a majority position, beginning at 49%, in each new company they start. AVP does not share rights to intellectual properties; they hold the exclusive rights or license and give the

inventors a limited share; they will not modify current business practices to share royalties with a third party and,

Salk Institute Biotechnology Industry Association (SIBIA)

Located in La Jolla, California, SIBIA began as a not-for-profit organization and over time became a publicly-held, for-profit company as the medically-related technologies being developing became commercial realities. SIBIA's current staff is 110; of these, 96 are in the laboratory.

It appears that SIBIA limits the commercialization of technologies to those developed within their laboratories and returns fees and royalties to its inventors. They are not necessarily interested in arrangements with outside organizations nor representing a third party in a field they are not familiar with.

Research Corporation Technologies (RCT)

Located in Tucson, Arizona, this group is one of the largest venture capital companies in the world. RCT represents over 150 universities worldwide. It now has two new groups, Ventures Development and Corporate Finance operations. RCT has a technical staff of over 100 in all their operations. Their patent process is out-sourced to patent firms but is managed by their in-house legal staff.

RCT has two modes of operation:

1. Full Services provides full funding, acquires all intellectual property rights, and then takes the technology to the market place. The process begins with a fee of \$1,000 for project review; if results are positive an engagement fee of \$3,000 is then required. A minimum 42 ½% of revenues is required.
2. Partial Service provides limited financial support or shares funding with the property owner. Fees are negotiated on a project-by-project basis.

While RCT will fully fund a project or share funding with the property owner (inventor/organization), they are not interested in arrangements with a third party.

Their projects fall into two categories: life sciences and physical sciences. The only projects associated with other are the few that fall into the general category of remediation technology.

Brentwood Venture Capital (BVC)

BVC is a southern California company with offices in Newport Beach and Los Angeles. They are interested in new technologies that offer an order of magnitude improvement over the current state-of-the-art.

BVC will spin-off separate entities with the purpose of taking them to Initial Public Offering (IPO) status. They do not take the entity to IPO status but oversees the selection of a firm to develop the IPO. BVC takes a stock position in all new entities and recovers its investment plus substantial cash at the IPO stage.

The parent of the technology can receive royalties or a negotiated one-time-only fee. With each project BVC designs an exit plan to take effect in one to three years from start up and limits its financial exposure from \$50,000 to \$500,000. In some cases, BVC will provide development funds for pilot or demonstration projects.

BVC is not interested in changing their business plans to include third party benefits.

Harbaugh Associates

Harbaugh Associates is a Santa Ana, California firm, which has a focused interest in the medical devices and healthcare market. Nevertheless, the process of technology transfer and market development is similar to the other firms interviewed.

They identify new technologies and accelerate their acceptance to the market place. They are currently looking for a biofilm inhibitor to solve a special problem with their cardiac catheter technology. They would be interested in NWRI's bio-film inhibitor research results, but is not interested in third party arrangements.

CONCLUSIONS

- All of the companies interviewed operate with similar approaches to the process of venture capitalization of new technology enterprises.
- Each expects a return on the investment and each want exclusive or near-exclusive rights to the intellectual property.
- Their expectations are from 42.5% to 55+% of the potential revenue streams generated from sales of the technologies.
- Each organizations controls every new entity they create and takes a majority interest in each.
- None of the organizations interviewed have water technology either as a central or peripheral interest.
- None of the organizations are interested in modifying their current business practices to include a third party arrangement to share profits, royalties or other fees.

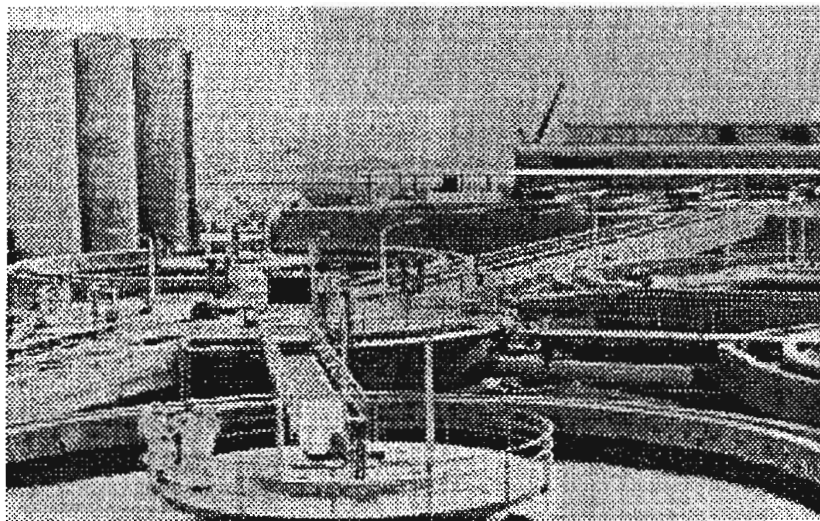
Creating a New For-profit Organization

Water utilities are often taken for granted as if they will always be there to provide all the water the customer needs whenever they want it. However, according to reports of water experts this luxury may not long be available based on evidence that possible water shortages loom as increasing populations place more demands on the current supplies as mankind enters the first decade of the new millennium.

Today, the state of California requires over three billion gallons of water daily to satisfy the needs of its current population of 35 million. Based on the forecast of the State of California, Department of Finance, this demand will increase at the rate of over 60 million gallons per day over the next 10 years.

Like other commodities water costs money to obtain, and like any commodity the level of demand versus supply determines the price structure. As economics dictates, the price of water in the next century will no doubt be substantially higher than we have known. Water is a very profitable business and will continue to be in the future. No one system or technology can provide the overall answer to future water problems.

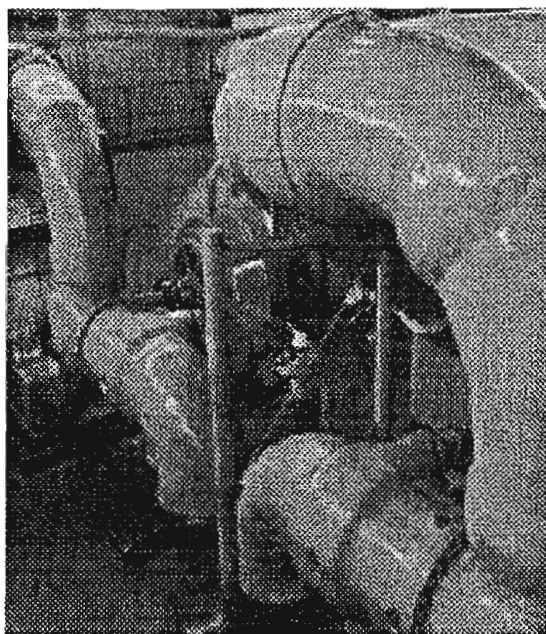
There are many scientists, engineers, inventors and organizations throughout the world who are dedicated to developing new, more efficient ways to provide clean water. Through the research enterprise, a greater understanding of how to provide more efficient ways to provide high-quality potable water and to dispose of waste waters will be achieved.



A municipal water treatment plant in Saudi Arabia was designed in part to convert sea water into drinking water.

Historic models of public utilities are rapidly changing. One in particular, the privatization model, appears to be gaining acceptance for the energy and water utilities which seem to be the targets in the new privatization movement.

For the last three decades the processes of technology transfer associated with aerospace and defense related projects have led to the development of a significantly expanded business base throughout the United States and indeed the world. With the new millennium often referred to as the "Century of Water," it appears appropriate that the technology transfer processes can be exploited for emerging new water-related technologies.



The Chicago Area Pumping Station was built in 1989. Today its capacity is 280 million gallons per day.

Public Health Issue

Although great strides have been made in the world to raise the standard of living of countries throughout the world, and there are many more first and second world nations today than ever before, there still remains the ever present threat of water borne illness. We live in a country with the highest living standard in the world, however in 1996 there were several incidence of exposure to water borne illness from the pathogen *E.coli*.

President Clinton in his address to the nation on January 23, 1997, has sworn to put into place laws and regulations to prevent the contamination of consumables in America.

Water born illness is, according to the United Nations World Health Organization, the most important health issue of the next century. No country is immune from water borne illness. More than 4,000 Japanese children became ill in 1996 from eating radish sprouts in their school lunches. Several hundred died as a result of public health officials not being able to rapidly detect *E. coli* and treat the victims in a timely manner. A similar event occurred again in 1997 when young people consumed bean sprouts infected with *E. coli* after being washed and cleaned with water from a contaminated source.

The examples above are good reasons for continuing research dedicated toward the prevention and elimination of this kind of water borne problem.

The AQUA VENTURES 2000 Concept

Aqua Ventures 2000 (AV2000) will be created as a commercial company to provide consulting and business services to scientists and engineers, inventors, and small companies who have developed viable intellectual properties, inventions, and products but lack the sophistication required to take advantage of opportunities to successfully transfer their technology into commercial ventures.

AV2000 will make available to the scientific community business opportunities to enhance their abilities to interface with those who can translate the language of business and finance into terms to which they can relate. **AV2000** will create the opportunities for the hundreds of thousands of scientists, engineers, and inventors of the world so that their dreams of commercial success can become their reality.

AV2000 will provide the following services which are necessary to achieve that success:

- Business Planning & Development
- Technical Consulting Services
- Match-making of Technology with Appropriate Industry
- Management and Manpower Services
- Financial Consultation, Including Financing Service
- Marketing and Sales Assistance
- Product Development
- Research Services
- Patent and Licensing Service
- Research Support for Qualified Persons and Organizations

AV2000 will conduct its business based on ethical and professional practices.

Aqua Ventures 2000

PRIORITY OF TASKS

- Recruit Management and Staff
- Recruit and Install Board of Directors
- Initial Capitalization (start up)
- Create Board of Advisors
- Develop and Implement the Awareness Program
- Recruit Regular and Preferred Members for **AV2000**
- Attract Water Projects and Other Commercial Opportunities

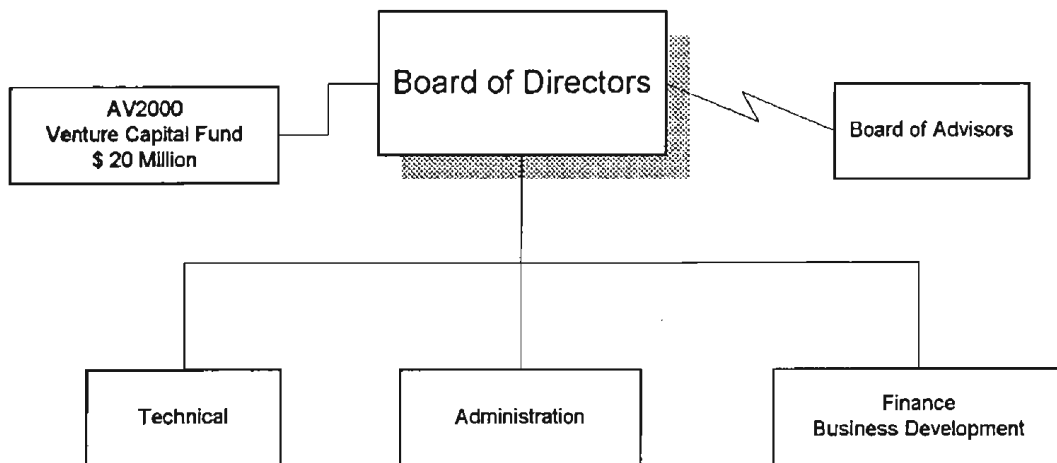
Aqua Ventures 2000

GOALS

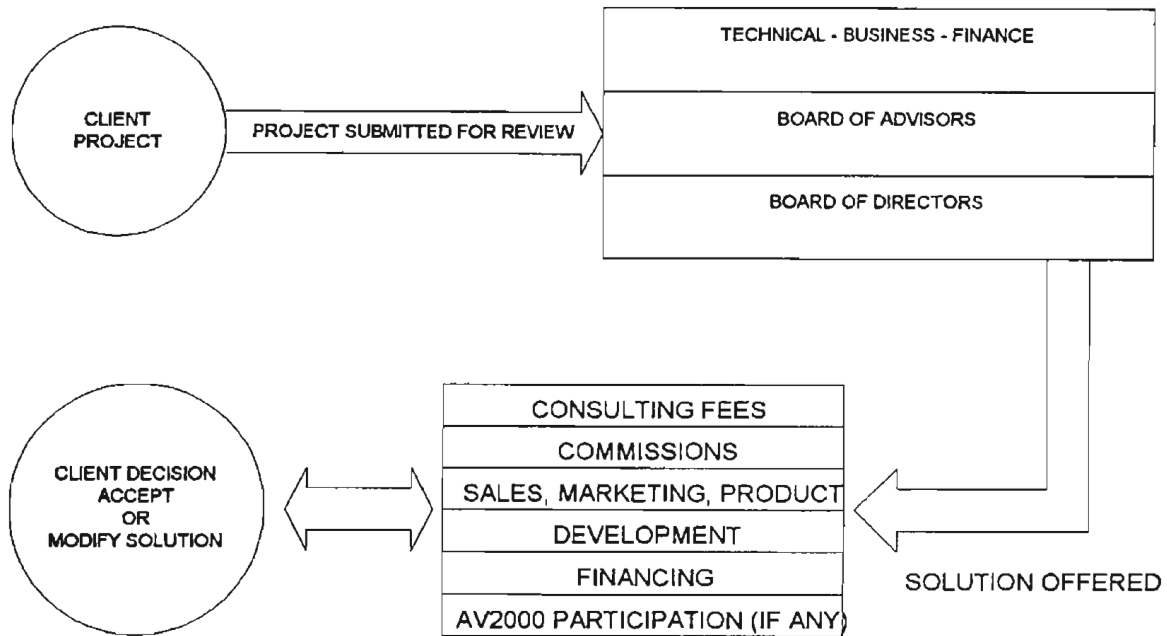
- Capitalize **AV2000**. Sale of common stock for capitalization of **AV 2000**'s working capital fund - \$1,500,000.
- Launch a global marketing and awareness program directed at attracting companies and individual inventors to seek **AV2000** services.
- Establish an internationally recognized Board of Advisors composed of experts and authorities in business, finance, and water technology.
- Launch a global marketing and awareness program directed at attracting individuals and companies to join **AV2000**'s regular member and preferred member programs.
- Establish the **AV2000** Venture Capital Fund.
- Commercialize within the first 12 months two intellectual properties, inventions, and/or technology products through the **AV2000** method.
- Establish research grants and awards to deserving organizations and individuals.

In addition, **AV2000** will seek to establish an annual worldwide conference of small water systems technology where scientists, inventors, governments and private industry may meet and exchange ideas and promote mutual projects. This would not be just a show and tell, but an opportunity for worthy projects to be evaluated, supported, funded and begin the process to commercial success. The conference would also present opportunities for participants to meet the "who's who" in the water business and the "who's who" in business and government.

AQUA VENTURES 2000



AQUA VENTURES 2000 OPERATIONAL SCHEMATIC



Operational Schematic of AQUA VENTURES 2000

AQUA VENTURES 2000 can be viewed as the “middle man” interacting with the various companies and opportunities it comes in contact with.

Aqua Ventures 2000 Board of Directors:

The Board of Directors shall comprise strategic persons from the:

- Business Community
- University-based Science and Engineering
- International Water Organizations
- Local, State and Federal Government
- High Profile Political Persons
- Legal Profession

The Board of Directors may be individual stockholders of AV2000.

THE CONCEPT OF THE AV2000

ADVISORY BOARD AND MEMBERSHIP PROGRAM

Preferred Members Program

AV2000 shall create a Preferred Members program which shall function as a part of its overall development strategy to expand its windows of opportunity in the market place. It is envisioned these members will offer **AV2000** insights into emerging technologies from research centers throughout the nation. Other benefits are as follows;

- This program will keep **AV2000** in touch with the worldwide technology communities who are active in the water industry via the newsletter and periodic functions and conventions it shall organize.
- The program will also serve as a powerful word-of-mouth marketing vehicle to support the future growth of **AV2000**.
- **AV2000** shall provide all the services and elements necessary to commercialize a company's technology.
- The program will reduce the need a for large sales force.
- A unified feeling created by the membership as a group helps to ensure cooperation between members.
- Members are typically the owners of technology. They are the scientists and engineers.

Aqua Ventures 2000 Board of Advisors

The Board of Advisors will be composed of individuals with expertise in the fields of water and waste water and related technologies. The duty of the Board will be to be aware of new and emerging technologies being developed with significant potential to the industry. The Board will maintain a high standard of practice among its members and will assist the Board of Directors in the general development of AV2000. The members of the Board of Advisors shall have a opportunity to become stockholders of AV2000.

Aqua Ventures 2000

FINANCIAL SECTION

Funding Requirements:

1. Initial Capitalization - \$ 500,000
2. Sale of Common Stock - \$ 1,500,000

AV2000 PROFORMA

INCOME ¹

6 Projects: Project Values \$ 79 Million ² Net Income: \$ 12,250,000

Subscriber Dues: 1,750 Members ³ Net Income: \$ 1,625,000

TOTAL \$ 13,875,000

EXPENSES ⁴

Estimated Expenses: **TOTAL \$ 600,000**

Net Operating Income (N.O.I.) TOTAL \$ 13,275,000

¹ Does not include consulting, royalty, licensing or equity amounts

² Estimated values

³ Arbitrary number used for these purposes only

⁴ Estimate

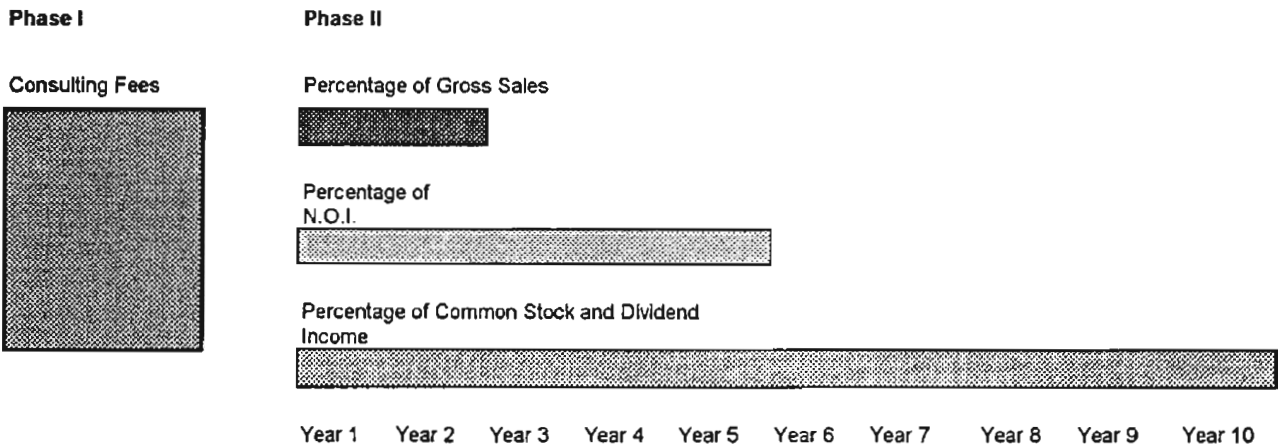
Potential Projects

- **A.E.S. Bio-Reactor** - A state of the art bio-reactor for small waste water systems.
- **Marshall Islands** - Overall project short- and long-range planning including technical consulting and sale of equipment for drinking water and waste water treatment systems for a 8-year development mixed use project.
- **In - Pipe Technology-** An innovative waste water treatment technology that utilizes collection system piping environments for treatment by injecting engineered bacteria prior to the standard treatment plant thereby substantially eliminating odor.
- **Critical Point Technologies, Inc.** - Apparatus and Method for Nucleic Acid Isolation and Extraction Using Super Critical Fluids, a NWRI sponsored project and intellectual property.
- **BisBal** - An ideal biocide concentrating on membranes of *E.coli* bacteria. Ideal for bio-film prevention in water filtration systems, in metal working fluids and for anti-fouling paints. BisBal purifies water better than chlorine at lower concentrations with far less toxicity.

Aqua Ventures 2000

Concept of Profits

The manner of deriving profits from a client project for AV2000 is based on the following manner of compensation:



* Years indicating length of time participating in income at various levels are shown for example purposes only.

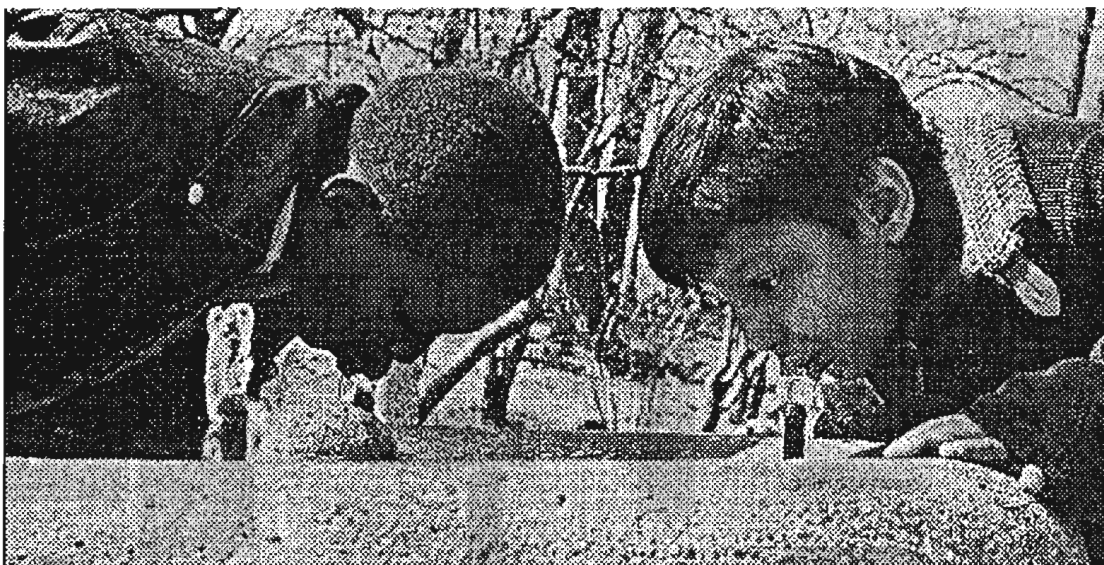
Percentage of Gross Sales: A percentage of the company's gross sales amount shall be agreed upon and paid to AV2000 on a regular basis.

Percentage of Net Operating Income (N.O.I.): A percentage of the company's N.O.I. shall be agreed upon as compensation and paid to AV2000 on a periodic basis.

Percentage of Common Stock and Dividend Income: A percentage of the company's common stock shall be agreed upon as compensation and transferred to AV2000. AV2000 may elect to increase or decrease the total amount of common shares held. Dividends when declared shall be paid to AV2000.

Other Compensation: AV2000 may be compensated with fees for initial set-up of new business or expansion of existing businesses. It may also earn consulting and other fees related to its services for the client company.

AV2000 may have ownership of the common stock of the client company, shall act as a service company, and is not to be construed as employee.



Maybe there is nothing better than a good drink of water.

AV2000 Venture Capital Fund



FUNDING FOR A BETTER FUTURE

AV2000's Venture Capital Fund

Aqua Ventures 2000's Venture Capital Fund will be created to provide venture capital funding for worthy water-related projects. The **Fund's** primary purpose will be to provide financing for water-related projects. It shall also arrange or provide investment capital for qualified companies or individuals with projects related to the water industry. The **Fund** and its management is committed to making sure that water will be available for the world communities in the coming millennium.

Some of the highlights of the fund are:

- \$ 20,000,000 (USD) initial fund start-up with \$ 100 Million (USD) (+) ability to expand.
- Municipal, government and foreign government financing, investment and leasing a specialty.
- Debt and Equity financing.
- The **Fund** has established relationships with multi-tiered funding sources from Wall Street's major investment bankers to mid-sized and smaller finance and investment houses across America. Further funding sources in foreign countries is being organized. The **Fund** will be able to fund virtually any size project anywhere.
- **AV2000** Board of Directors and Venture Capital Fund Finance Director's checks and approvals are done "in-house".
- Quick reaction time - 30 days from application to funding.
- Reasonable and competitive rates.
- Ethical and professional business practices.
- Member of the National Venture Capitalist Association.

Aqua Ventures 2000 Venture Capital Fund

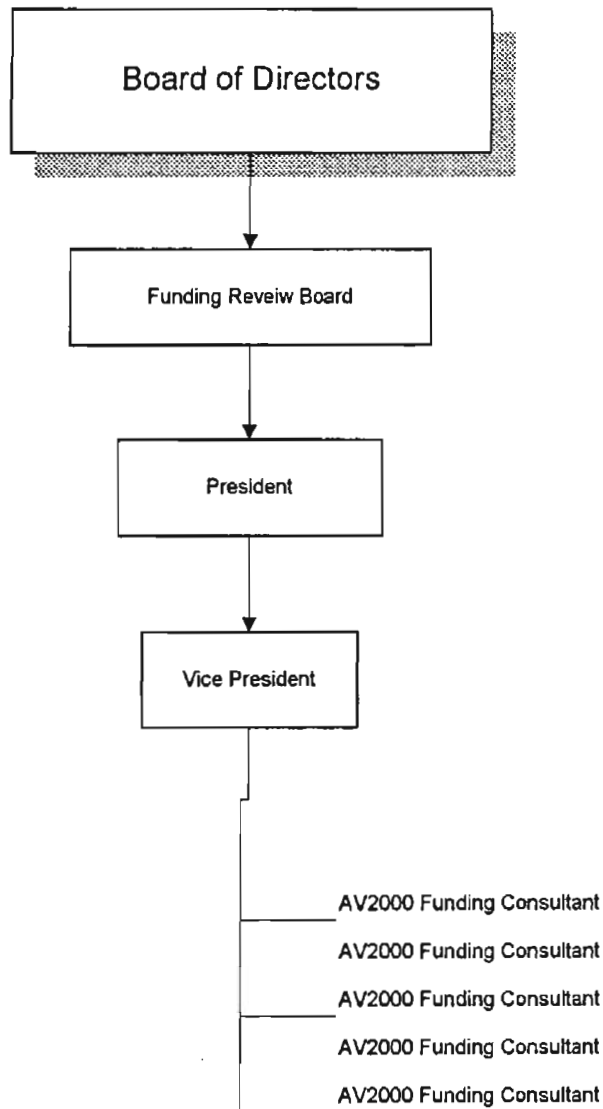
Organization and Management

The following are staff and management positions of the venture capital fund:

- Board of Directors
- Funding Review Board
- President
- VP Finance
- AV2000 Funding Consultants

A consultants from the **AV2000 Venture Capital Fund** shall be assigned to a funding applicant and will explain in detail every step of the process and procedures to obtain the desired funds from the **Fund**. The consultants shall represent the client company in their funding request.

AQUA VENTURES 2000 VENTURE CAPITAL FUND



The formation of AV2000 fund depends, in part, on the following:

1. Results of a survey of Wall Street debt and equity finance sources being conducted.
2. Results of a local (State of California) financial institutions survey regarding funding participation on future projects.
3. Assessment of the results of the surveys taken of the local and Wall Street financial institutions as to the positive interest in participating in the fund.
4. Approval of the Board of Directors and stockholders of AV2000.
5. Recruitment of the staff required to operate the fund as a business.

The Fund Organizers

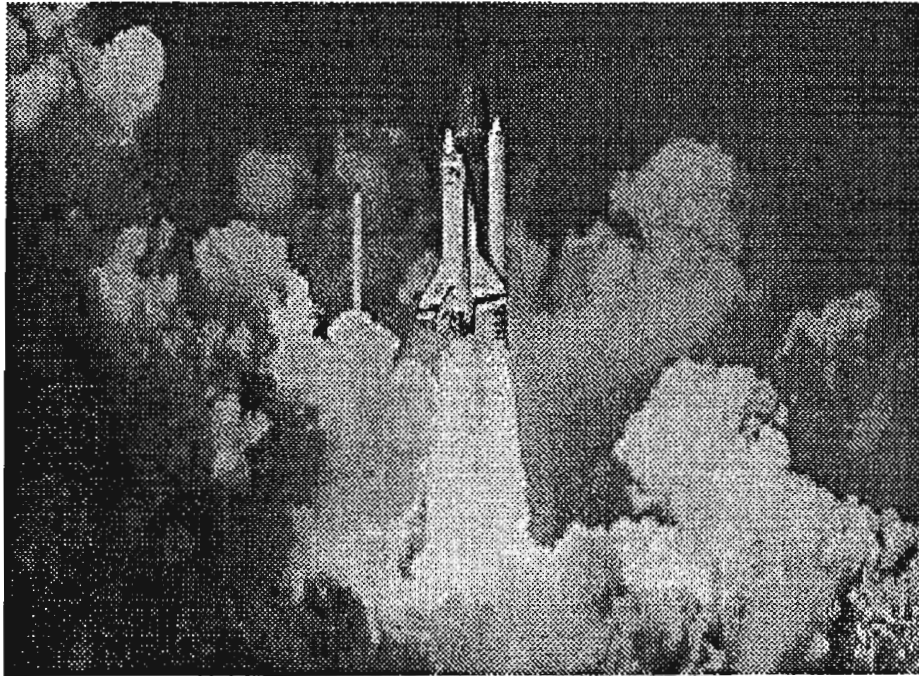
Alvin Hirano, President PACOR, a financial services company and John Long, Chairman of the Board of Crescent Communications, a financial services company, have joined forces and are currently investigating the possibilities of creating the water venture capital fund.

Mr. Hirano and Mr. Long have worked on several significant projects together after their mutual introduction was initiated by Paine Webber on a joint project in the Brazilian gold mine project that involved Mitsubishi Heavy Metals Corp. Since then they have joined forces on several projects including a corporate acquisition, development of a building systems company, and financing for a medical technology development company.

Mr. Long has been in the investment industry for more than 40 years including serving as a member of the Board of Governor of the NASDAQ Stock Exchange. Upon his retirement he remains as a consultant to NASDAQ the Rockefeller Foundation, and other notable organizations. He is cited as being the premiere authority in North America on gold exploration financing. He and his son manage and operate Crescent Communications. They represent many companies on the NADAQ, Vancouver, Luxembourg and other exchanges as "specialists" promoting their client companies to investor groups and investment bankers throughout America and Canada.

Alvin Hirano has been in the investment finance industry for the past 30 years. He was a partner in a investment banking company and licensed NASD broker-dealer for 15 years. He was responsible for taking more than 20 companies through their initial public offering. After involvement in mergers & acquisitions, making markets, and the general brokerage and banking field he became a real estate developer, investment strategist and a limited partnership financing specialist.

Opening a office in Tokyo, Japan, from 1988-1993, Mr. Hirano was involved in over \$800 Million of construction - development projects. In the role of Coordinating Developer was in joint venture with several top Japanese development-construction companies, such as Kumagai Gumi and Asahi Jyukun.



Without project funding the world might still be flat.....