



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549-0402

DC

No Act

P.E. 12-26-02

February 28, 2003

Robert E. Cox
Vice President, Associate General Counsel
and Assistant Secretary
PepsiCo, Inc.
700 Anderson Hill Road
Purchase, New York 10577



03016568

Re: PepsiCo, Inc.
Incoming letter dated December 26, 2002

1934
Section _____
Rule 14A-8
Public Availability 2-28-2003

Dear Mr. Cox:

This is in response to your letter dated December 26, 2002 concerning the shareholder proposal submitted to PepsiCo by Trillium Asset Management and Real Assets Investment Management Inc. We also have received a letter from the proponents dated January 16, 2003. Our response is attached to the enclosed photocopy of your correspondence. By doing this, we avoid having to recite or summarize the facts set forth in the correspondence. Copies of all of the correspondence also will be provided to the proponents.

In connection with this matter, your attention is directed to the enclosure, which sets forth a brief discussion of the Division's informal procedures regarding shareholder proposals.

Sincerely,

Martin P. Dunn
Deputy Director

Enclosures

cc: Steve Lippman
Senior Social Research Analyst
Trillium Asset Management Corporation
369 Pine Street, Suite 711
San Francisco, CA 94104-3314

Kai Alderson
VP, Social Research
Real Assets Investment Management Inc.
Suite 801 1166 Alberni Street
Vancouver BC
Canada V6E 3Z3

PROCESSED

MAR 12 2003

THOMSON
FINANCIAL

DC

RECEIVED

2002 DEC 27 PM 4:02

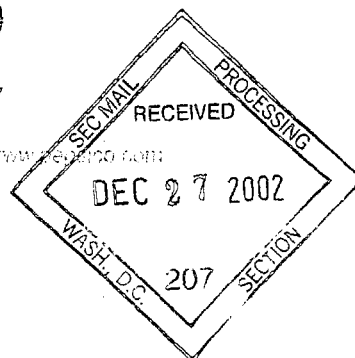
OFFICE OF CHIEF COUNSEL
CORPORATION FINANCE



PEPSICO



700 Anderson Hill Road Purchase, New York 10577 www.pepsico.com
TEL: (914) 253-2281 FAX: (914) 259-4207



SECURITIES AND EXCHANGE COMMISSION
OFFICE OF CHIEF COUNSEL
CORPORATION FINANCE
JUDICIARY PLAZA
450 FIFTH ST., N.W.
WASHINGTON, D.C. 20549

VIA FEDERAL EXPRESS

December 26, 2002

Securities and Exchange Commission
Office of Chief Counsel
Division of Corporation Finance
Judiciary Plaza
450 Fifth St., N.W.
Washington, D.C. 20549

Re: PepsiCo, Inc. (File No. 1-1183) 2003 Annual Shareholders' Meeting -
Shareholder Proposals

Dear Madam or Sir:

Pursuant to Rule 14a-8(j) under the Securities Exchange Act of 1934 (the "Exchange Act"), PepsiCo, Inc. (the "Company") hereby notifies the Securities and Exchange Commission (the "Commission") of its intention to omit from the Company's proxy materials (the "Proxy Materials") for its 2003 Annual Shareholders' Meeting (the "Annual Meeting") the proposal and supporting statement submitted by Trillium Asset Management and Real Assets Investment Management, Inc. (collectively, the "Proponents"), dated November 20, 2002 and November 19, 2002, respectively (the "Proposal") (attached as Attachment A). As required by Rule 14a-8(j), six copies of the Proposal and six copies of this letter are enclosed herewith.

By copy of this letter, the Company is also notifying the Proponents of the Company's intention to omit the Proposal from its 2003 Proxy Materials for the reasons stated below.

The Proposal may be omitted from the Company's 2003 Proxy Materials as it has been substantially implemented by the Company and is, therefore, moot.

Rule 14a-8(i)(10) provides that a shareholder proposal may be excluded from a company's proxy statement if the proposal has been rendered moot. A proposal may be considered moot if the registrant has "substantially implemented" the action requested.

To be substantially implemented and therefore moot, the proposal need not be implemented in its entirety. Rather, the standard is whether the company's particular policies, practices and procedures compare with those in the proposal. See Exchange Act Release No. 20091 (August 16, 1983) (the "1983 Release"); *Texaco, Inc.* (March 28, 1991). Where the company has already established policies and procedures that relate to the subject matter of the proposal or where the company has implemented the essential objectives of the proposal, the Staff has regularly found that such proposal has been substantially implemented under Rule 14a-8(i)(10). See *The Talbots Inc.* (April 5, 2002) (finding that a proposal requesting the company to establish a code of corporate conduct relating to human rights had been substantially implemented through the company's existing Standards for Business Practice and code of conduct); *The Gap, Inc.* (March 16, 2001) (finding that a proposal requesting a report on child labor practices of the company's suppliers had been substantially implemented through the company's existing code of vendor conduct); *Kmart Corp.* (February 23, 2000) (same).

The Proposal requests a report from the Company evaluating the business risks associated with the use of water throughout the Company and its supply chain, including its subsidiaries and bottlers. The Proposal requests, in particular, that the report include "special reference to our company's current policies and procedures for mitigating the impact of operations on local communities in areas of water scarcity."

In the Whereas clause of the Proposal, the Proponents highlight four points in support of their belief that a business case exists for developing long-term corporate water use strategies:

1. the increasing costs of water,
2. the risks of business disruption due to water-related issues,
3. customer expectations relating to water use and related impacts, and
4. the link between a company's ability to operate or expand and water-related issues.

The Proponents then cite three outside sources in support of their position that water use and impact present business risks against which the Company must strategize.

Long before the submission of the Proposal, the Company began analyzing and taking action on the issue of water use and conservation, the very subject matter of the Proposal. The Company has a long history of encouraging innovation and implementing new technologies that promote water conservation and mitigate the impact of the Company's water use on the communities in which the Company operates. The Company also recognizes the value of making its shareholders and customers, as well as the public, aware of its policies and procedures with respect to water issues.

To this end, in late November 2002, the Company released a special report entitled "Environmental Commitment" (the "Report"), which provides substantial and detailed information on the Company's policies and procedures with respect to a number

of environmental issues, including water. A copy of the report is attached as Attachment B. The Company's release of the Report, which is an updated version of prior reports, occurred almost simultaneously with the Proponents' submission of the Proposal.¹

The Report first sets out the Company's Environmental Principles, including the following, which substantially align with the tenets of the Proposal:

- We strive to minimize the impact of our businesses on the environment. We seek methods that are socially responsible, scientifically based and economically sound.
- Using scientific research and new technology, we work to continually improve our environmental performance through conservation, source reduction, recycling and product packaging design.
- We support and implement programs that educate, train and motivate employees to conduct their activities on behalf of the corporation in an environmentally responsible manner. All employees are expected to assume responsibility as environmental stewards.
- We hold management accountable for upholding our environmental standards.
- We strive to cooperate with organizations and governments working to solve environmental problems, and we support policies and programs that improve the environment by setting reasonable standards for future conduct.
- We are committed to continually work to improve our environmental record through cooperative efforts involving our licensed and franchised partners our suppliers and our customers and consumers.

The Report then provides specific details and results of the practices and procedures implemented within each of the Company's businesses with respect to water issues around the world. The information in the Report that is most relevant to the subject matter of the Proposal is as follows:

¹ The Proponents have acknowledged to the Company that they were unaware of this special report at the time they submitted the Proposal.

Frito-Lay (see pages 14-15)

Frito-Lay is integrating environmental concern into designing products and processes. Optimum water usage and water recycling targets are identified to minimize the environmental impact without compromising quality, health and food safety standards.

- FLNA maintains a continuous focus on water conservation at all manufacturing facilities. The program consists of water conservation training, target water usage rates and weekly water usage tracking. Over a five year period, Frito-Lay has saved close to 1.5 billion gallons of water.
- Frito-Lay Europe has been monitoring water consumption across its region since 1999. This reduced "water usage per ton produced" by more than 20% on average, in most larger plants in 2001 compared to 1999.
- In making potato chips, water is used to wash away excess starch that comes from the potato slices. Once the starch is removed from this water, the water is reused in processing operations. Recycling this process water can reduce the amount of fresh water used by 50%.
- Land application of wastewater on nearly 3,000 acres at five plants in the United States results in ecologically sound reuse of processing wastewater to produce alfalfa and Bermuda grass hay for animal feed.
- Frito-Lay continues to improve its environmental audit program, which is conducted annually at every manufacturing plant across the United States and Canada. The audit program assures ongoing environmental compliance and reviews each facility's progress against its waste reduction goals.
- Through the Green Team program, over 12,000 manufacturing associates have been trained to improve their environmental awareness and understand how they can do their jobs without adversely impacting the environment.

Pepsi-Cola (see page 8)

- Pepsi-Cola plants are increasingly designed to avoid burdening municipal wastewater treatment systems and reduce our use of water.
- PepsiCo Beverages International has developed an evaporator system to treat wastewater and collect useable solids for other uses. This has been installed in Mexico and Uruguay concentrate plants.
- A number of Pepsi-Cola Canadian bottling facilities participate in provincial, regional and/or municipal water conservation programs.
- In India, Pepsi-Cola designed a tomato-processing plant so it could treat and discharge wastewater into a local irrigation system, providing a suitable source of clean water for farmers.
- Some of Pepsi-Cola U.S. bottling plants are designing a dual drain system for their wastewater. Low strength waste can go directly to the sanitary sewer, while high strength wastes are recycled into cattle feed stock and industrial grade alcohol.
- In some countries, Pepsi-Cola is able to use desalinized water. This supports municipal efforts to conserve water.
- In the absence of local standards, Pepsi-Cola applies company standards in all concentrate and bottling facilities. These cover wastewater treatment and other matters.
- In the three main bottling facilities in Russia, Pepsi-Cola has designed the wastewater treatment plants so that the biochemical oxygen demand (BOD) in the discharge water is significantly below the levels allowed by local laws and meets World Bank standards. In its Samara plant, Pepsi-Cola cleans and reuses water from the caustic washing system, thus reducing the overall use of caustic and neutralizing chemicals, saving water, and reducing the amount of water we discharge.
- All Pepsi bottling plants in China utilize their own wastewater treatment plants, conserving water resources.
- In Central America, the conversion from glass to plastic bottles has drastically reduced the use of water and has increased the quality of the water discharges. Initiatives are in place to study plastic recycling.

Gatorade (see page 12)

- All of our Gatorade manufacturing locations have pH control systems in place to ensure that wastewater discharged to local wastewater treatment utilities conforms with permit limitations. Over the past few years, Gatorade has invested in excess of \$2 million to install and upgrade wastewater pH pretreatment systems.
- In the Kissimmee, Florida, manufacturing facility, Gatorade installed a state-of-the-art wastewater system in 1998 that resulted in an over 95% biological oxygen demand (BOD) reduction in wastewater effluent. The effluent from this system is so well treated that in 2002, it will be discharged to the municipal water reuse line where it will be used for watering golf courses and lawns, and also will be used for non-contact cooling water in non-foods facilities.
- In 1999, the Dallas Gatorade facility cooling system was upgraded to allow for the reuse of cooler water, saving up to 150,000 gallons of water per day. The Dallas Gatorade facility also received the Blue Thumb award from Dallas Water Utilities for its water conservation efforts.
- In some instances, Gatorade plants capture nutrient rich wastewater and provide it to farmers for animal feed. The Mountaintop, Pennsylvania Gatorade plant engages in this effort to offset wastewater loading.
- All underground storage tanks have been either removed safely or closed-in-place to ensure protection of underground water resources.
- Canadian Gatorade operations have made a number of changes to decrease water usage, including: conversion to low flow toilets and high efficiency shower heads in locker rooms; resizing of water nozzles used for clean-up; conversion to high pressure wash systems where appropriate; installing cooling towers to recycle cooling water; and increasing dry cleanups vs. wet wash downs.

Tropicana (see page 10)

- Tropicana recaptures and reuses about 400,000 gallons of water a day at its Bradenton, Florida plant. The water is used for cleanup and wash down. That is enough water saved to supply 1,600 homes.
- At Tropicana's facility in Fort Pierce, Florida, the company recaptures and reuses approximately 150,000 gallons of water each day.

Quaker Foods (see page 17)

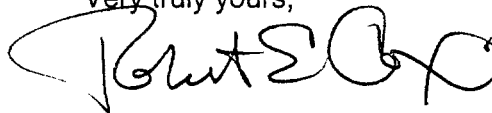
- In 1999, the Danville Foods plant installed a new hot water cleaning system. This high-pressure system reduced by approximately 100,000 gallons per week the water used and wastewater generated at this facility.

As the foregoing list illustrates, the Report is proof positive that the Company is very much aware of the issues raised by the Proposal and has taken significant steps to develop and implement an overall environmental strategy, which includes goals to reduce the Company's use of water and to mitigate the impact of its water use on the communities in which the Company operates. Consistent with the essential objectives of the Proposal, the Company's environmental strategy, the goals and results of which are set out in the Report, is a result of the business case underlying environmental issues, including water issues. In pursuing its environmental principles, the Company will continue to look for ways to expand its efforts in these areas. At the present time, however, the Company believes that it has substantially implemented the Proposal and that, as a result, the Proposal is moot.

Based on the foregoing, the Company respectfully requests the Division's concurrence with its decision to omit the Proposal from the Company's 2003 Proxy Materials, and further requests that we be notified of this. If you have any questions on this matter, you may telephone the undersigned at (914) 253-3281.

Please file-stamp and return one copy of this letter in the enclosed, self-addressed stamped envelope.

Very truly yours,



Robert E. Cox
Vice President, Associate General
Counsel and Assistant Secretary

Enclosures

cc: (Via Certified Mail/Return Receipt Requested)

Steve Lippman
Senior Social Research Analyst
Trillium Asset Management Corporation
369 Pine Street, Suite 711
San Francisco, CA 94104-3314

Securities and Exchange
Commission

-8-

December 26, 2002

Kai Alderson
VP, Social Research
Real Assets Investment Management Inc.
Suite 801 1166 Alberni Street
Vancouver BC
Canada V6E 3Z3

Elaine Palmer, PepsiCo

**PEPSICO
REPORT ON BUSINESS RISKS LINKED TO WATER USES**

Whereas,

The business case for developing long-term corporate water use strategies has never been stronger (GEMI, 2002):

- Total water costs are increasing in unexpected ways;
- Risks of business disruption due to water-related issues are increasing;
- Customer expectations relating to water use and impacts are evolving; and,
- Businesses' "license to operate" and ability to expand are increasingly tied to water-related performance

Scientists predict that water use for households, industry, and agriculture will increase by at least 50% over the next twenty years, leading to greater competition for water resources and, potentially, higher water prices (IFPRI & IWMI, 2002).

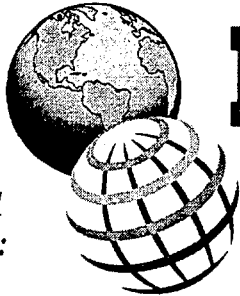
Industrial water users are likely to face changes in water-related regulatory regimes that may lead either to price increases or supply constraints or both. Currently more than 1 billion people around the world do not have access to a safe water supply. World leaders agreed at the World Summit on Sustainable Development in Johannesburg to cut in half the number of people without access to clean water by 2015 (WSSD, 2002).

The bottled water industry is particularly exposed to reputation risks when disputes with local communities arise over water use. Competitors, such as Nestle Waters North America, are engaged in court proceedings with a local citizens' group over a proposed bottling operation in Michigan (BusinessWeek, 2002).

Bottled water makes up a small but fast-growing component of our company's product portfolio, further compounding the potential for brand risk if conflicts with local communities over water use issues were to increase.

Therefore Be It Resolved, that the Board prepare a report to shareholders (at reasonable cost and omitting proprietary information) by September 2003 evaluating the business risks linked to water-uses and impacts throughout our company's supply chain, including subsidiaries and bottling partners, with special reference to our company's current policies and procedures for mitigating the impact of operations on local communities in areas of water scarcity.

Special
Report:



Environmental Commitment

Message from the Chairman

PepsiCo is defined by its relationships— including our relationship with the environment.

We view our environmental responsibility as covering all areas of our business. Each of our divisions and facilities is empowered to find solutions to its unique environmental challenges. Each of our employees is encouraged to act as an environmental steward.

We at PepsiCo are proud of our environmental record and our relationship with the environment. As with any successful relationship, we're working continually to improve it.

*Steven S Reinemund
Chairman and Chief Executive Officer*



PEPSICO



Tropicana

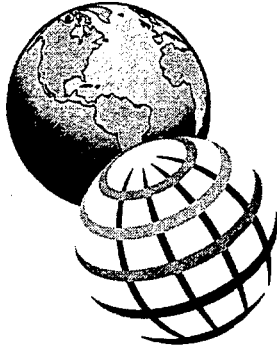


PepsiCo is among the world's largest food and beverage companies. Our businesses include: Frito-Lay, the world's largest manufacturer and distributor of snack chips; Pepsi-Cola, the world's second largest beverage company; Tropicana, the world's largest marketer and producer of branded juices; Gatorade, the world's leading sports drink and Quaker, a leading manufacturer and marketer of cereals, rice and pasta and other grain-based products. PepsiCo brand names are among the best known and our operations reach every corner of the world.

As a consumer products company, an important environmental challenge facing all our divisions is the packaging generated by our products. Packaging is important to public health and safety and is a critical component of the distribution system that delivers products to consumers and commercial establishments. To meet these needs and safeguard the environment, we follow the Environmental Protection Agency's (EPA) approach of Reduce, Reuse and Recycle.

Each business also strives to be responsible in its use of resources in manufacturing and distributing our products.

This report covers our environmental commitment, the principles we follow, and progress at each of our businesses.



PepsiCo's Environmental Commitment

PepsiCo is committed to providing safe and healthy work environments and to being an environmentally responsible corporate citizen. It is our policy to comply with all applicable environmental, safety and health laws and regulations.

We believe that protecting the environment is an important part of good corporate citizenship. We are committed to minimizing the impact of our businesses on the environment with methods that are socially responsible, scientifically based and economically sound. We encourage conservation, recycling and energy use programs that promote clean air and water and reduce landfill waste.

- PepsiCo Worldwide Code of Conduct

PepsiCo's Environmental Principles

PepsiCo recognizes the environmental benefits of operating in a socially responsible manner. We are committed to the following environmental principles:

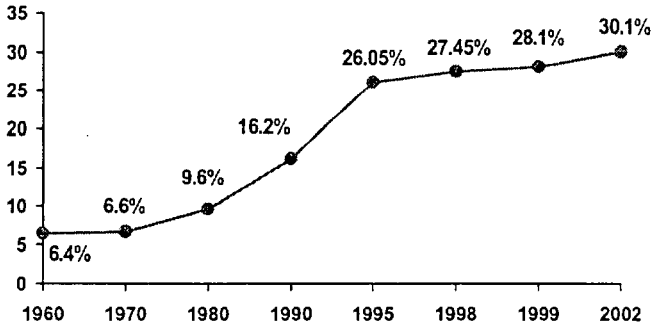
- We conduct our business in an environmentally responsible way. We comply with or exceed requirements of all applicable laws and regulations. In the absence of specific laws and regulations, our goal is to apply common sense environmental management practices and operate responsibly.
- We strive to minimize the impact of our businesses on the environment. We seek methods that are socially responsible, scientifically based and economically sound.
- Using scientific research and new technology, we work to continually improve our environmental performance through conservation, source reduction, recycling and product packaging design.
- We develop and apply programs that promote clean air and water, conserve energy and reduce landfill wastes. PepsiCo divisions are expected both to work together on programs that address environmental issues and to develop their own operational approaches when appropriate.
- We support and implement programs that educate, train and motivate employees to conduct their activities on behalf of the corporation in an environmentally responsible manner. All employees are expected to assume responsibility as environmental stewards.
- We hold management accountable for upholding our environmental standards.
- We strive to cooperate with organizations and governments working to solve environmental problems, and we support policies and programs that improve the environment by setting reasonable standards for future conduct.
- We are committed to continually work to improve our environmental record through cooperative efforts involving our licensed and franchised partners, our suppliers and our customers and consumers.

PepsiCo is committed to operating in an environmentally responsible manner.

U.S. Record on Waste

In 2002, the Environmental Protection Agency (EPA) published a report on "Municipal Solid Waste in the United States." The report, prepared by Franklin Associates, Inc., tracks Municipal Solid Waste (MSW) from 1960 to 2000. MSW consists of everyday items including product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances and batteries.

Total Material Recovered



Source: Franklin Associates, Ltd.

The report notes that over time, recycling rates have increased from 10% of waste in 1980 to 30% of waste in 2000. In 2000, MSW totaled 231.9 million tons; 69.9 million tons were recovered for recycling.

Among all wastes in the United States, containers and packaging were the most recycled materials. Containers and packaging totaled 74.7 million tons; 29.1 million tons or 38.9% of the waste generated by containers and packaging was recovered for recycling. This is up from 10.5% in 1960.

Source reduction and reuse have helped reduce the growth of waste in the United States. Containers and packaging materials were reduced by 15.5 million tons. The largest reduction was in corrugated boxes, which are often used to transport products. Overall, some 70.7% of all corrugated boxes were recycled.

Beverages

U.S. Record on Soft Drink Container Recycling

Soft drink containers are the most recycled consumer packaging in the United States. In 2000, nearly 52 billion soft drink containers, 54.6%, were recycled.

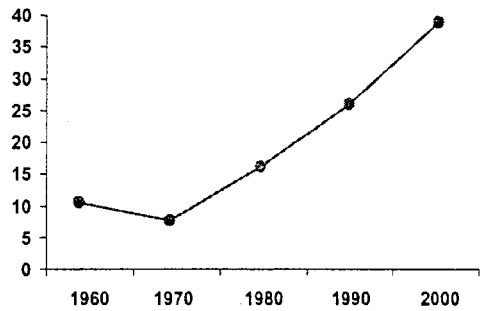
In the last decade alone, the number of soft drink containers recycled increased by 20%.

From 1988 to 2000, the soft drink container share of municipal solid waste declined 58%, from 1.6% of the Municipal Solid Waste stream to 0.67%. This was accomplished through increased recycling and manufacturing lighter containers. In 2000, soft drink containers were being recycled at near record levels. Industry-wide, 62.1% of all aluminum containers are now recycled, 32.8% of glass bottles are recycled and 35.0% of plastic bottles. A report prepared for the U.S. Environmental Protection Agency (EPA) estimated that beverage containers weighed 25% less in 1994 than in 1972.

Containers and packaging are the most recycled materials in the U.S. Municipal Solid Waste Stream.

Municipal Solid Waste in the United States

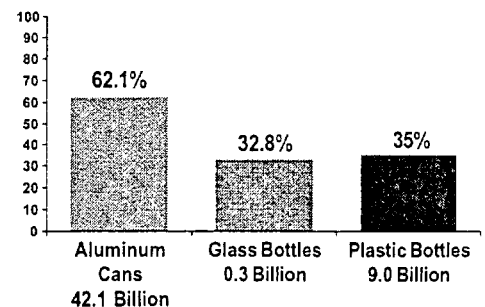
Recovery of Containers & Packaging (in % of generation)



Source: Franklin Associates, Ltd.

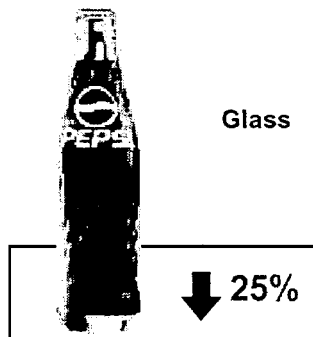
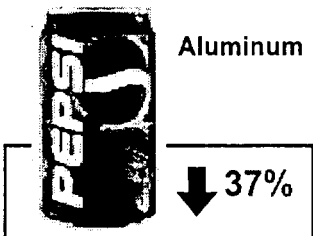
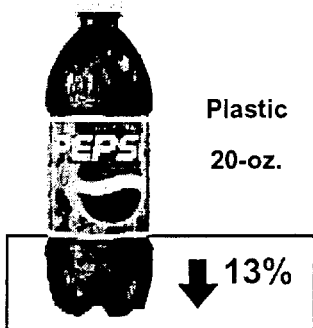
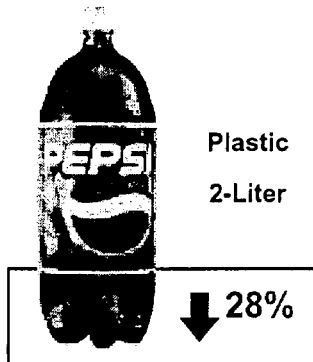
Soft Drink Container Recycling in the United States

Recycling by Packaging (Total Units)

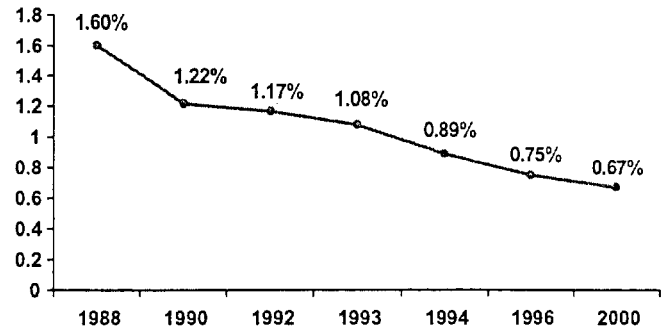


Source: NSDA, 2000

Reducing Weight of Containers



Percent of soft drink containers in Municipal Solid Waste (MSW) stream has consistently decreased since 1988.



% of soft drink container discards in Municipal Solid Waste
Source: National Soft Drink Association

Pepsi-Cola

Pepsi-Cola is committed to the hierarchy established by the U.S. Environmental Protection Agency of Reduce, Reuse and Recycle.

Environmental awareness starts with design of consumer packaging to minimize its impact on the environment. For example, Pepsi-Cola supports source reduction through the use of less material in the manufacture of containers. All consumer packaging is designed for convenient recyclability.

Pepsi-Cola has aggressive recycling and waste minimization programs. The company has ongoing research in conservation and has a record of meeting many environmental requirements ahead of schedule. It is a leader in conserving natural resources.

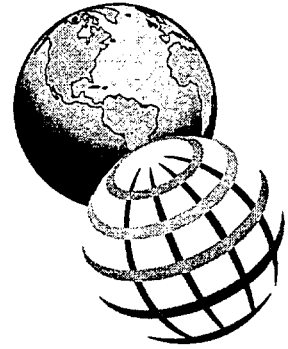
In 2002 Pepsi-Cola announced that by 2005, its plastic bottles would contain 10% recycled content and committed the company's purchasing operations to working with suppliers to develop safe, economical and sustainable packaging. This initiative will complement the company's initiatives in other areas.

Solid Waste

Reduce

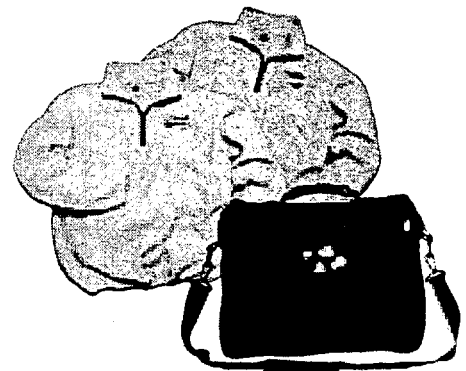
- Pepsi-Cola has consistently reduced the amount of material in its packages. This "lightweighting" has:
 - Reduced our use of plastic in 2-liter bottles by 28% (67 million pounds per year).
 - Reduced our use of plastic in 20-ounce bottles by 13% (60 million pounds per year).
 - Reduced our use of aluminum in cans by 37%.
 - Reduced our use of glass by 25%.
- In 1995, Pepsi-Cola began gradually reducing the size of the lid on its aluminum cans throughout the United States and Canada, and is now doing so in Europe. In 1998 the Environmental Protection Agency (EPA) named Pepsi a "Sustained Leader in Waste Prevention" for producing a lighter package. This has saved 37 million pounds of aluminum annually.
- In 1972, it took 46 pounds of aluminum to produce 1,000 cans. Today, it only takes 29 pounds to produce the same number of aluminum cans.
- Larger package sizes have helped reduce packaging for each gallon of soft drinks Pepsi-Cola sells.

- Across North America, and in a number of international markets, Pepsi-Cola has switched to lighter weight "bag-in-a-box" systems for dispensing soft drinks in restaurants and soda fountains. This has saved fuel for distribution and reduced the amount of waste. And suppliers have developed a returnable/reusable box for the system. In Canada in 1993, Pepsi-Cola was awarded the Haight Packaging Award for adopting this system.
- More than 90% of Pepsi-Cola plastic PET bottles in the United States are distributed in reusable plastic trays. This keeps over 450 million pounds of corrugated cardboard out of landfills and saves over a million trees annually. In the United States and Canada, Pepsi-Cola grinds and reuses the plastic from damaged trays, incorporating about 35% recycled plastic in replacement trays.
- In selected locations in Europe, Canada and the United States, Pepsi-Cola has utilized reusable, bulk containers to deliver liquid and solid components of soft drink concentrates to Pepsi-Cola bottling plants.
- In Europe, Pepsi-Cola is a member of EUROPEN, the European Organization for Packaging and the Environment. Pepsi's soft drink packaging has been made significantly lighter throughout Europe.
- In the United States, Pepsi-Cola has met the voluntary packaging challenge recommended by the Coalition of Northeastern Governors (CONEG) requiring best efforts to reduce the use of packaging materials through reducing the weight of the package. Pepsi-Cola Canada, as a member of the Canadian Soft Drink Association, committed to meeting the 50% voluntary packaging diversion target set by the National Packaging Protocol.
- In Spain, Pepsi-Cola reduced the weight of both primary and secondary packaging. In addition, manufacturing facilities are using natural gas to reduce emissions.



Reuse

- Pepsi-Cola uses previously used materials to make its containers, thus saving millions of pounds of material and, in many cases, significant energy resources.
- Aluminum cans contain 51.2% previously used aluminum cans.
- Glass bottles contain 25% - 35% previously used glass.
- Plastic bottles will contain 10% recycled plastic by the year 2005. In 2002 we will use at least one million pounds of recycled plastic in Pepsi-Cola bottles.
- Corrugated packaging contains up to 35% recycled content and paper board, 15%.
- Pepsi-Cola promotes the use of collected plastic soft drink bottles in making such items as carpet, fiber, automotive parts, strapping and non-food grade bottles.
- Pepsi-Cola works with PET producers and reclaimers in support of collecting and recycling PET soft drink bottles. The industry has awarded grants to perform research on developing new products made from recycled plastic soft drink bottles. Today, all post-consumer PET plastic that is recovered is used to make new containers, fiberfill for sleeping bags and coats, fabric, carpets, auto parts, film and more.



*The beverage industry
has helped develop
new products made
from recycled soft
drink bottles.*

Soft drink containers are the most recycled packaging in the United States.



PET Recycling Container

PepsiCo is committed to Reduce, Reuse and Recycle.

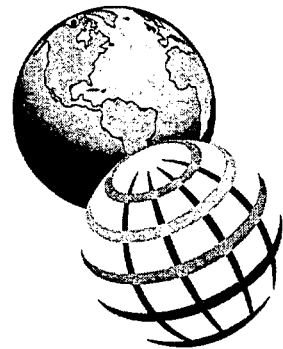
Recycle

- All Pepsi-Cola containers are designed for easy recycling and more than half are recycled, making soft drink containers the *most recycled packaging* in the United States.
- Pepsi-Cola is working with suppliers and bottlers to develop a PET (polyethylene terephthalate) bottle that contains 10% recycled content. Pepsi-Cola PET plastic bottles will include 10% recycled content by 2005. We are currently conducting tests with suppliers on the safety of 20-ounce and 2-liter plastic bottles containing various recycled resins. We are developing a sensory protocol for Pepsi-Cola bottles containing recycled plastics.
- Pepsi-Cola supports comprehensive systems of efficient waste management as defined by the U.S. Environmental Protection Agency. The company supports initiatives that encourage source separation using curbside recycling, which we view as the most effective and convenient waste management tool. In the past two decades over 9,000 curbside programs have been created. With an additional 10,000 drop-off programs also established, over 55% of the United States public has access to recycling outlets.
- Pepsi-Cola continues to be an active supporter of recovery and recycling programs in the United States, Canada, Europe, Australia and elsewhere. For example, Pepsi-Cola is a founding member of the European Recovery and Recycling Association (ERRA), established to demonstrate effective and efficient recovery and recycling practices. Throughout Europe, Pepsi-Cola is also a member of national recovery organizations.
- In the United States, 48 million Pepsi-Cola aluminum cans are recycled each day. In Canada, over 50% of soft drink containers are recycled, and this continues to rise.
- Over the years Pepsi-Cola has made the plastic PET bottle more easily recyclable in the United States, Canada, Europe and elsewhere. Pepsi-Cola eliminated base cups in most markets, switched to polypropylene caps instead of aluminum metal caps, and in many parts of Europe switched to shrinkfilm labels, thus avoiding adhesive and paper contamination.
- In U.S. and Canadian bottling plants, packages damaged during filling are collected and recycled – glass, plastic and aluminum. Many plants also recycle used packaging from incoming materials – corrugated packages, straps from pallets, etc. This has reduced plant waste by 50 - 75%, avoiding disposal costs and landfilling.
- Pepsi-Cola established one of the first programs in the country to collect and recycle the plastic ring connectors from six-packs. Since then the company has established similar programs with its supplier, HiCone, at over 10,000 schools across the country. Many of the Pepsi-Cola bottling partners have established programs to recycle ring connectors collected after filling vending machines with cans. And if some consumers do litter, North American ring connectors are photo degradable and have a “breakaway” pull tab so they can be easily separated, minimizing any impact on wildlife.

More Solid Waste Prevention

Pepsi-Cola beverages are distributed by a network of independent bottlers around the United States and in most other locations around the world. Here are some of the efforts going on within the Pepsi-Cola system.

- Since 1990 in the United States, Pepsi-Cola has been refurbishing rather than replacing more and more vending equipment – up to 25,000 units per year – saving many tons of materials from going to landfills. Pepsi-Cola Canada operates a similar program.
- After its useful life, the activated carbon Pepsi-Cola uses to purify the water for its beverages is returned to the supplier, who reactivates it for a second use in non-food applications. This prevents many tons of material from entering landfills.
- The polyethylene film covering Pepsi-Cola products during distribution on pallets is collected after it is used and sold to recyclers, who convert it for other uses.
- Pepsi-Cola has been an active partner with its suppliers in the introduction and use of reusable recycled plastic pallets made from recycled plastic for the delivery of new cans and plastic PET bottles. These pallets are nonbreakable and longer lasting, too.
- In 1998, Pepsi-Cola's Arlington, Texas, beverage concentrate plant thoroughly reviewed its waste management practices. It identified all potentially recyclable materials and implemented practices to capture and sort the materials. This provided a significant cost savings and diverted 70% of the plant's waste from landfill into recycling and new products.
- Pepsi-Cola bottlers have aggressive waste minimization programs in plants and in distribution centers. Waste in many plants has been reduced by at least 50% by separating recyclables from other trash.
- In Turkey, Pepsi-Cola is a founding member of CEVKO, the Environmental Protection and Packaging Waste Recovery and Recycling Trust. This organization helps promote recycling in conjunction with business, consumers, local authorities and recyclers.
- In Ireland, a systematic review of raw materials and packaging led to a significant reduction in the volume of waste generated.



*Pepsi-Cola refurbishes
rather than replaces
more and more
vending equipment.*



Manufacturing Programs

Air Quality

- Pepsi-Cola North American vending machine refurbishment programs use water-based paint, which eliminates volatile emissions.
- All Pepsi-Cola vending machines, fountain equipment and cooler display units have been converted to the non-CFC refrigerant approved by the U.S. Environmental Protection Agency.
- In the United States, Pepsi-Cola bottlers utilize preventative maintenance programs to assure that distribution trucks operate as efficiently as possible. Pepsi-Cola has also converted its delivery trucks to operate on EPA-recognized clean diesel fuels. In Eastern Europe, Pepsi-Cola has replaced many older delivery trucks with modern, fuel efficient vehicles.
- Pepsi-Cola's three main bottling facilities in Russia have new natural gas boilers. This not only brings the best technology into Russia, it also reduces sulfur and other emissions. The Pepsi-Cola facility in Moscow was given a special award for environmental protection by the local environmental agency.



***Pepsi-Cola
environmental
programs cover air,
water, gas and other
natural resources.***

- In Ireland, the new plant uses natural gas, thereby reducing air emissions.

Water Quality/Water Use

- Pepsi-Cola plants are increasingly designed to avoid burdening municipal wastewater treatment systems and reduce our use of water.
- PepsiCo Beverages International has developed an evaporator system to treat wastewater and collect useable solids for other uses. This has been installed in Mexico and Uruguay concentrate plants.
- A number of Pepsi-Cola Canadian bottling facilities participate in provincial, regional and/or municipal water conservation programs. In India, Pepsi-Cola designed a tomato-processing plant so it could treat and discharge wastewater into a local irrigation system, providing a suitable source of clean water for farmers.
- Some of Pepsi-Cola U.S. bottling plants are designing a dual drain system for their wastewater. Low strength waste can go directly to the sanitary sewer, while high strength wastes are recycled into cattle feed stock and industrial grade alcohol.
- In some countries, Pepsi-Cola is able to use desalinated water. This supports municipal efforts to conserve water.
- In the absence of local standards, Pepsi-Cola applies company standards in all concentrate and bottling facilities. These cover wastewater treatment and other matters.
- In the three main bottling facilities in Russia, Pepsi-Cola has designed the wastewater treatment plants so that the biochemical oxygen demand (BOD) in the discharge water is significantly below the levels allowed by local laws and meets World Bank standards. In its Samara plant, Pepsi-Cola cleans and reuses water from the caustic washing system, thus reducing the overall use of caustic and neutralizing chemicals, saving water, and reducing the amount of water we discharge.
- All Pepsi bottling plants in China utilize their own wastewater treatment plants, conserving water resources.
- In Central America, the conversion from glass to plastic bottles has drastically reduced the use of water and has increased the quality of the water discharges. Initiatives are in place to study plastic recycling.

Management and Shipment of Materials

- Pepsi-Cola provides materials handling and spill response information to its bottlers worldwide so they understand proper handling procedures for concentrates, and how to deal with them if they are spilled.
- In Pepsi-Cola concentrate plants, all employees are trained in spill prevention, spill control and countermeasures.

Other Activities

- The inks on Pepsi-Cola soft drink packaging are free of heavy metals.
- In the United States, Canada, Europe and elsewhere, Pepsi-Cola actively works in communities and with regulators and our industry colleagues to create effective solutions to environmental issues.

- Pepsi-Cola's major beverage concentrate production facilities in Ireland and Mexico have received independent certification that they meet the requirements for an environmental management system (EMS) according to ISO 14001.

National Program Support

Pepsi-Cola is a long time sustaining member of the national Keep America Beautiful (KAB) organization and one of the major sponsors of its annual Spring GREAT AMERICAN CLEAN-UP event, supporting anti-litter and pro-recycling efforts.

Pepsi-Cola supports through the National Soft Drink Association (NSDA), annual awards recognizing and providing financial support to litter prevention in business, government, school, non-profit and community sectors.

Pepsi-Cola is partner with many of its customers—restaurants and grocery stores— and its suppliers as well as a supporter of industry efforts as:

- National Recycling Coalition (NRC)
- Association of Postconsumers Plastics Recyclers (APR)
- America Recycles Day
- National Association for PET Container Resources (NAPCOR)

Pepsi-Cola supports the American Plastic Council's All Bottles program, encouraging curbside recycling of all plastic bottles.

Pepsi-Cola provides recycling resources to customers such as schools and universities. Resources include collection bins, information and, in some cases, balers to assist recycling.

In Canada, Pepsi-Cola actively and financially supports recycling in the province of Ontario through the Corporations Supporting Recycling (CSR) association.

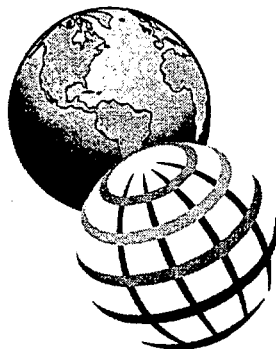


Local Program Support

For 30 years, Pepsi-Cola and its bottlers have actively encouraged recovery of beverage containers through numerous local programs. These programs include curbside recycling programs, drop-off programs and recovery efforts by schools, Boy Scout troops and other community organizations. Examples of these programs include:

- Funding the creation and distribution of recycling information for households of Washington, D.C.
- Establishing a "Get Caught Recycling" program to encourage plastics recycling in Minnesota.
- Supporting the state of Ohio in placing recycling bins at highway rest stops.
- With grocers in California, supporting an in-store education program to increase plastics recycling by consumers.
- Providing a number of schools and universities with recycling bins.
- In partnership with Wellman, Inc., sponsoring a traveling fashion show featuring fabric made from recycled soft drink bottles.
- Funding education activities of the South Carolina Partnership on Plastics Recycling.
- Funding a 10-country recycling program involving students in Kentucky. More than 37 tons of materials were collected.

For 30 years, Pepsi-Cola and its bottlers have actively encouraged recovery of beverage containers through numerous local programs.



Tropicana has a long history of reducing and recycling solid waste and reducing air and water emissions.

Tropicana recycles leftover peels and seeds.

Tropicana

Environmentally sound practices are in place at Tropicana's major production and office facilities in North America, Europe and Asia. As the world's largest juice producer and marketer, Tropicana has a long history of reducing and recycling solid waste and reducing air and water emissions. Tropicana's juices are natural products, minimally processed, and this is reflected in the company's approach to the environment.

Solid Waste

- Each year, Tropicana purchases about one-third of Florida's total orange and grapefruit crop, nearly 4.5 billion pounds of fruit. Virtually every part of the fruit is used. Once the juice is squeezed from the fruit, the leftover peel and seeds are recycled and sold as cattle feed. This efficient reuse diverts 2.3 billion pounds of waste each year from landfills.
- Before the peel is dried into cattle feed, Tropicana extracts valuable oils, essences and biodegradable solvents. These products are then sold or used by the company.

Recycling

- In the United States alone, Tropicana recycles 6,000 tons of corrugated boxes annually. According to the New York Legislative Commission on Solid Waste Management, one ton of recycled paper saves 17 trees.
- Each year, Tropicana recycles more than 16 million pounds of materials including:
 - 1,400 tons of scrap metal
 - 460 tons of paper cartons
 - 143 tons of plastic bottles
 - 106 tons of office paper
 - 2 tons of aluminum cans
- Most Tropicana office workers at major locations have individual recycling bins at their desks for paper recycling.
- At Tropicana's Borgloon, Belgium facility, juice bottles shipped throughout Europe are returned to the facility, washed, sterilized and refilled.

Water and Wastewater

- Tropicana recaptures and reuses about 400,000 gallons of water a day at its Bradenton plant. The water is used for cleanup and washdown. That is enough water saved to supply 1,600 homes.
- As a byproduct of the wastewater treatment, Tropicana produces about 90 million cubic feet of methane gas. The gas is used to fire the company's glass melting furnaces, providing 7% of the total energy required for glass production.
- At Tropicana's facility in Fort Pierce, Florida, the company recaptures and reuses approximately 150,000 gallons of water each day.

Packaging

During the 1990s Tropicana significantly reduced its use of packaging materials:

- Reduced the weight of its 96-ounce plastic bottle by 33% — from 124 grams to 85 grams.

- Reduced the weight of its plastic pour spouts on its cartons by 53% — from 5.5 grams to 2.6 grams.
- Reduced the weights of its 16- 20 - and 32-ounce bottles by 10%
- We are saving more than 50 million pounds of packaging annually as a result of the recent conversion from 46-ounce glass bottles to 1.75 liter PET bottles. PET is one of the most readily recyclable packaging materials available.
- By converting 16-ounce bottles from glass to plastic (recyclable PET) in 2001, more than 52 million pounds of packaging is being saved.
- The 1.75 liter Twister plastic bottle (PET) was 97 grams in 1989 and is now 85 grams, a savings of 12 grams or 12.4%.

Other Activities

- Tropicana uses natural gas, considered the cleanest industrial fuel, to power its flagship Bradenton juice operations. Natural gas fires its boilers, electrical cogeneration plant, feed mill and glass plant. Tropicana uses 5.5 billion cubic feet of natural gas each year. Compared to the cleanest fuel oil, Tropicana's use of natural gas reduces emissions of sulfur dioxide by 75%, nitrous oxide by 56% and particulates by 61%.
- In the United States, Tropicana is the only food or beverage company that operates its own trains. The famous Tropicana juice train runs daily from Bradenton to its distribution centers near New York and Cincinnati. Trains are the most energy-efficient way to move juice products to market.
- Each of the company's 354 refrigerated rail cars has been converted to non-CFC refrigerants.
- Tropicana uses water-based inks and paints low in volatile organic compounds (VOC).

Gatorade

Gatorade environmental efforts include:

1. Priority programs including wastewater treatment and discharges, air emissions, spill prevention and response.
2. Third-party reviews of all facility environmental programs.
3. The development of programs for sustainability. Focus areas include energy use, wastewater generation and solid waste.

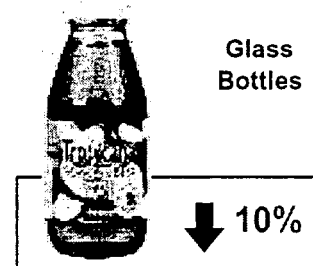
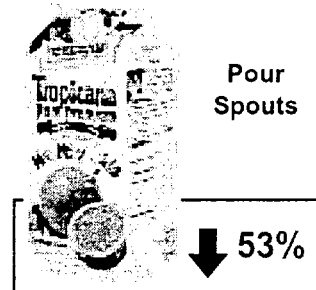
All Gatorade facilities are expected to manage environmental areas commensurate with the risks they pose. Where appropriate, each facility has formal plans and policies in place.

Following an assessment, each facility works to develop and implement plans to address observations. Additionally, each facility receives a follow-up review to reassess the status of their environmental programs.

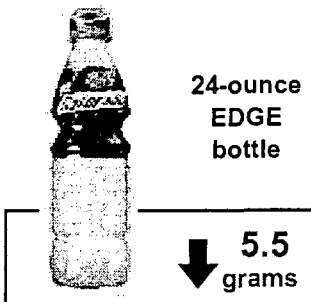
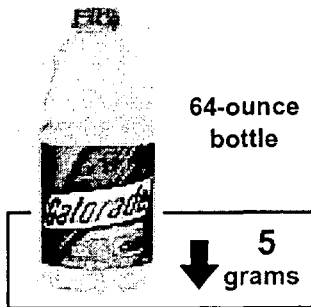
Packaging

Over the years, Gatorade has successfully decreased the weight of several of its bottles to reduce solid waste generation:

Lightweighting of Containers



Lightweighting of Containers



Gatorade programs focus on sustainability, including energy use, wastewater generation and solid waste.

- The weight of the 64-ounce Gatorade bottle was reduced by 5 grams.
- The E.D.G.E. 24-ounce sport bottle is 5.5 grams lighter than the former 24-ounce sport bottle — almost a 17% reduction in PET.
- Gatorade continues to pursue similar opportunities with more of its packages.

Recyclability

- All Gatorade bottles are completely recyclable.
- Gatorade recently changed the label on the E.D.G.E sport bottle to facilitate recycling.
- The caps on Gatorade bottles are polypropylene and do not interfere with recycling.

Recycled Content

- Many 20-, 32- and 64-ounce PET Gatorade bottles are made from post-consumer resin. This reduces solid waste generation.

Water and Wastewater

- All our Gatorade manufacturing locations have pH control systems in place to ensure that wastewater discharged to local wastewater treatment utilities conforms with permit limitations. Over the past few years, Gatorade has invested in excess of \$2 million to install and upgrade wastewater pH pretreatment systems.
- In the Kissimmee, Florida, manufacturing facility, Gatorade installed a state-of-the-art wastewater system in 1998 that resulted in an over 95% biological oxygen demand (BOD) reduction in wastewater effluent. The effluent from this system is so well treated that in 2002, it will be discharged to the municipal water reuse line where it will be used for watering golf courses and lawns, and also will be used for non-contact cooling water in non-foods facilities.
- In 1999, the Dallas Gatorade facility cooling system was upgraded to allow for the reuse of cooler water, saving up to 150,000 gallons of water per day. The Dallas Gatorade facility also received the Blue Thumb award from Dallas Water Utilities for its water conservation efforts.
- In some instances, Gatorade plants capture nutrient-rich wastewater and provide it to farmers for animal feed. The Mountaintop, Pennsylvania Gatorade plant engages in this effort to offset wastewater loading.

Other

- Many of our Gatorade operations have “recycling centers” where plastic waste is compacted and then sent to a local recycler, resulting in significant reduction of solid waste entering landfills.
- All boilers in our Gatorade facilities are fueled by natural gas, a very clean burning fuel.
- All underground storage tanks have been either removed safely or closed-in-place to ensure protection of underground water resources.
- All polychlorinated biphenyl (PCB) containing materials have been replaced with safe dielectric substances.

Snack Foods

Frito-Lay

Frito-Lay North America (FLNA) has a dynamic people-based environmental program that is recognized as being among the best in the U.S. industry. Frito-Lay's "Green Team" program begins with assurance of regulatory compliance, and then expands to include all facets of the environmental spectrum.

Walkers Snack Foods Limited is Frito-Lay's largest business unit in Europe. Through its environmental management system, overall environmental performance is monitored, improvement targets are defined and extensive training on environmental awareness is provided for all sites in the United Kingdom.

Agro-materials:

- Frito-Lay Europe is encouraging the application of environmentally sound agricultural practices with its suppliers of agro-materials.
- Through Frito-Lay's European Agro-program, assistance to farmers and raw material suppliers is provided where appropriate and their compliance is audited against both legislation and Frito-Lay Agro-Standards.
- Frito-Lay Europe is promoting the use of integrated Pesticide Management and encourages the use of pesticides which only use low amounts of active ingredients, and have a minimum impact on beneficial species.

Waste Reduction

- Frito-Lay, which uses packaging that is environmentally safe for incineration, contributes to waste to energy combustion improvement programs in Europe and Japan for generating steam or electricity.
- Walkers Snacks Foods Ltd., is providing continuous waste management awareness training for all employees at all United Kingdom sites.

Source Reduction

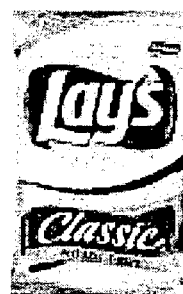
- Frito-Lay is committed to minimizing the amount of packaging it uses while ensuring that it continues to protect and maintain the freshness of its products.
- Packaging material and seal design changes are saving over 7 million pounds of packaging material annually in the United States.
- The Frito-Lay Europe "Packaging Room Management Program" aims for maximum machine efficiency and minimum packaging and product losses. Plant film waste is monitored continuously. This reduced plant film waste by 40% in 2001 compared to 1997.
- Frito-Lay Europe has reduced by 14% the weight of the overwrap film used for multipacks.
- Inks used to print Frito-Lay packaging are essentially free of heavy metals.

Packaging Recycling

Frito-Lay North America

- Approximately 13,000 route sales employees are directly involved in carton reuse and recycling, returning empty cartons the stores to plants for reuse.

Frito-Lay programs cover all facets of the environmental spectrum.



7 million pounds of packaging saved





Delivery boxes are reused on average of five times.



Recycling is considered when designing new packaging.

- Delivery boxes are reused an average five times. Coupled with recycling, each year this program diverts about 60 million pounds of cardboard from landfills, reduces the demand for paperboard by nearly 120,000 tons and saves more than one million trees.
- Frito-Lay puts a major emphasis on ensuring recyclability of new packaging designs. Our new canister packages are constructed primarily of HDPE and are fully compatible with plastic recycling programs.

Frito-Lay Europe

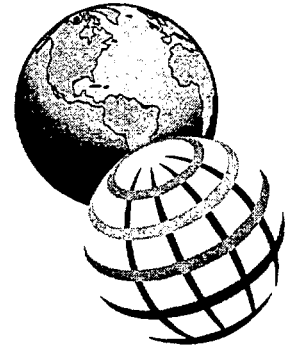
- Frito-Lay Europe has established a strategic packaging supply base and works closely with its European film packaging suppliers to recycle the post-converter packaging waste (clear and printed film) into plastic pellets. These can then be supplied as raw material for injection molding into non-food products (e.g. flowerpots, garden furniture, plastic pallets, etc.). This has the potential of removing close to 2,000 tons of packaging waste annually from final disposal starting in 2002.
- Frito-Lay is constantly looking for opportunities to maximize the use of recycled paper in cases and cardboard. This has resulted in a 100 % recycled paper content in most cases.
- Frito-Lay companies in Europe are joining national packaging recovery and recycling organizations and initiatives which promote collection and recycling of post-consumption packaging waste and reduction of packaging waste going to final disposal.

Water Quality/Water Use

Frito-Lay is integrating environmental concern into designing products and processes. Optimum water usage and water recycling targets are identified to minimize the environmental impact without compromising quality, health and food safety standards.

- FLNA maintains a continuous focus on water conservation at all manufacturing facilities. The program consists of water conservation training, target water usage rates and weekly water usage tracking. Over a five year period, Frito-Lay has saved close to 1.5 billion gallons of water.
- Frito-Lay Europe has been monitoring water consumption across its region since 1999. This reduced "water usage per ton produced" by more than 20% on average, in most larger plants in 2001 compared to 1999.
- In making potato chips, water is used to wash away excess starch that comes from the potato slices. Once the starch is removed from this water, the water is reused in processing operations. Recycling this process water can reduce the amount of fresh water used by 50% .
- Starch that is removed is dried and then sold to industrial manufacturers for reuse in the production of paper and coating products.
- Frito-Lay is the second largest producer of industrial grade potato starch in the United States. In a single year, Frito-Lay recovers over 50 million pounds of starch, reducing the waste it would otherwise send to municipal wastewater treatment plants and providing a valuable by-product for use by other industries.
- In 2000, Frito-Lay Europe recovered over 13,000 tons of starch.

- Frito-Lay's Frankfort, Indiana, plant utilizes on-site wastewater treatment to remove more than 99% of the solid and organic matter from its processing wastewater. It also captures waste heat from cooking potato chips to heat the building, saving about 400,000 gallons of heating oil each year.
- In Frito-Lay North America more than 156,000 tons of wet and dry food processing wastes are captured each year and used as animal feed instead of going to landfill. Another 20,000 tons are recovered in Frito-Lay Europe.
- Land application of wastewater on nearly 3,000 acres at five plants in the United States results in ecologically sound reuse of processing wastewater to produce alfalfa and Bermuda grass hay for animal feed.



Air Quality

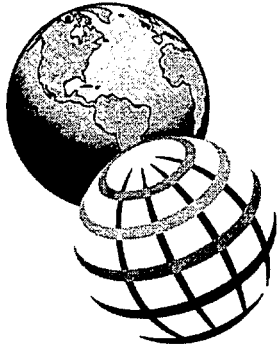
- Most of Frito-Lay's manufacturing plants burn natural gas as the primary fuel. Natural gas is a clean fuel that produces lower emissions of air pollutants than many other fuels.
- Frito-Lay's manufacturing plant in Bakersfield, California, produces its own energy and then some. Cogeneration is one of the most energy efficient means of power generation. By burning a single energy source, natural gas, both steam and electricity are produced. Both steam and electricity are used by the plant, and the excess electricity is sold to the local utility company. Frito-Lay's cogeneration system is helping to offset the utility company's need to build additional costly power generation plants.
- Sabritas, Frito-Lay International's market-leading Mexican snack food business, launched 450 electric-powered delivery vans in 1993 to serve major urban centers in Mexico. The vans, equipped with 12 rechargeable batteries, release no toxic emissions. In addition, the vans are 30% to 40% cheaper to operate than conventional vehicles and are easier to maintain.
- Re-engineering of Frito-Lay's sales routes has reduced fuel consumption by over 2 million gallons per year.
- Walkers Snack Foods Ltd. in the United Kingdom has joined a voluntary industry initiative and is committed to reduce energy consumption.
- Walkers Snack Foods Ltd. has an ongoing program on tactical driving techniques. This resulted in a 7% reduction in fuel use for transportation during 2001.

Frito-Lay starch recovery provides a valuable by-product for use by other industries.

Other Activities/Awards and Recognition

- Frito-Lay continues to improve its environmental audit program, which is conducted annually at every manufacturing plant across the United States and Canada. The audit program assures ongoing environmental compliance and reviews each facility's progress against its waste reduction goals.
- Frito-Lay's Green Teams include individuals from throughout its manufacturing facilities. These teams directly manage the day-to-day environmental business for each facility.
- Frito-Lay's Green Teams drive Pollution Prevention activities within their facilities. Every year the facility Green Team reviews their progress, identifies opportunities and establishes new goals for Pollution Prevention, focusing on reducing wastes going to landfill.
- Through the Green Team program, over 12,000 manufacturing associates have been trained to improve their environmental awareness and

Cogeneration saves power and money.



Frito-Lay Green Teams drive environmental programs at each facility.

Quaker priority programs cover wastewater, air emissions and spill prevention and response.

understand how they can do their jobs without adversely impacting the environment.

- Green Teams are also active outside their plants, providing community service or promoting environmental awareness within the community. Frito-Lay encourages these activities and presents the "Environmental Ambassador Award" annually to the team with the most significant environmental contribution to their community.
- The work of FLNA Green Teams is appreciated in their communities. Green Teams frequently receive awards of recognition in their communities for their work to minimize environmental impacts from our manufacturing processes.
- Frito-Lay's corporate headquarters also has a Green Team. The facility received the Plano Community Award for its organic waste recycling program. In addition, the headquarters team continually works to improve environmental awareness on the campus and drive recycling of paper. Every headquarters employee has a recycle container in his/her office. In 2001 the facility recycled more than 360,000 pounds of office paper and 150,000 pounds of cardboard that would otherwise have gone into a landfill.

FOODS

Quaker Foods

Quaker's environmental efforts can be broadly categorized into three areas:

1. Priority programs.
2. Regular and periodic third-party reviews of facility environmental programs.
3. Sustainability.

Priority programs include wastewater treatment and discharges, air emissions, and spill prevention and response. All Quaker facilities are expected to manage these areas commensurate with the risks they pose. Where appropriate, the company has formal plans and policies in place.

Quaker conducts third-party reviews of all environmental programs at the facility level. These reviews began in late 1998. Following an assessment, the facility works to develop plans to address observations. Additionally, each facility receives a follow-up review to reassess the status of its environmental programs.

Quaker is working to formalize efforts related to environmental sustainability. The business has identified energy use, water use and wastewater generation, and solid waste as focus areas.

Packaging Recyclability

- The vast majority of Quaker's Ready-to-Eat and Hot Cereals packaging is recyclable. This includes cartons, shipping cases, oat tubes, etc. Liners in the Ready-to-Eat cereal packages are recyclable. The pouch packaging for the Instant Quaker Oats and Instant Quaker Grits products also is recyclable with the paper stream.

Packaging Recycled Content

- To conserve natural resources, Quaker recently raised its internal standard of minimum post-consumer recycled content in food cartons and cases to 40% from 30%.

- Quaker is increasingly using cartons and cases that contain 100% recycled content.

Solid Waste

- Quaker's (and Gatorade's) headquarters in Chicago, Illinois, and its Research & Development (R&D) facility in Barrington, Illinois, have desk-side recycling programs that allow for easy collection of recyclable paper waste. There are also receptacles for recycling cans located throughout both facilities and receptacles for glass bottles in the Barrington facility.
- Quaker's largest facility, located in Cedar Rapids, Iowa, has a solid waste recycling program that diverts about 80% of its solid waste from landfills.
 - Corrugated cardboard is shredded and recycled at the rate of over 25,000 pounds per day.
 - 11,000 gallons of vegetable oils are recycled weekly.
 - Cardboard boxes are shipped back to the supplier weekly and reused approximately 36 times before their final disposal.
 - Approximately 70,000 tons of oat hulls a year are further processed into furfural, a solvent used in the plastics industry.
 - The facility has recycling efforts related to light bulbs, food waste, grass clippings, batteries, toner cartridges, computers, plastics, paper, bricks, cement blocks, used oil and oil filters, and nylon tote bags.
- In its Manhattan, Kansas, facility, Quaker recycles approximately 70,000 pounds of cardboard per month. Additionally, about 34,000 pounds of wheat germ waste is sold as animal feed.
- Quaker's Canadian operations have reduced the amount of solid waste going to landfills by approximately 60%.
 - Operations have site separation programs for cardboard, film, kraft bags, metals, nylon straps, fine paper, newsprint, etc.
 - Vacuum systems have been installed to recover food materials, which are shipped out as animal feed.
 - Quaker has worked with suppliers to reduce the weight of supplies such as kraft bag and carton thickness.
 - Remilling systems have been installed. These safely reprocess food products that otherwise would have been disposed of as waste.



Quaker packaging is recyclable.



Quaker programs divert solid waste from landfills.

Other

- In 1999, the Danville Foods plant installed a new hot water cleaning system. This high-pressure system reduced by approximately 100,000 gallons per week the water used and wastewater generated at this facility.
- Canadian Gatorade operations have made a number of changes to decrease water usage, including: conversion to low flow toilets and high efficiency shower heads in locker rooms; resizing of water nozzles used for clean-up; conversion to high pressure wash systems where appropriate; installing cooling towers to recycle cooling water; and increasing dry cleanups vs. wet wash downs.
- All boilers in Quaker facilities are fueled by natural gas, a very clean burning fuel.



Quaker works with suppliers to reduce the weight of bags and cartons.



Preserving Resources,
Preventing Waste

PepsiCo was a charter participant of the EPA WasteWise Program

- All underground storage tanks have been either removed or closed-in-place, in accordance with EPA guidelines.
- All polychlorinated biphenyl (PCB) containing materials have been replaced with safe dielectric substances.
- All property acquisitions include a minimum of a Phase I Environmental Site Assessment adhering to ASTM Standard E1527-00. When appropriate, Phase II Environmental Site Assessments are also performed.
- Quaker's manufacturing facility in Peterborough, Ontario, was awarded the U.S. Environmental Protection Agency's "Stratospheric Ozone Protection Award" in 2000 for the plant's work at reducing methyl bromide use (an ozone depleting substance) in North America.

PepsiCo World Headquarters

PepsiCo and Pepsi-Cola headquarters is home to the Donald M. Kendall Sculpture Gardens, a world famous sculpture and botanical garden that is open to the public year-round. The gardens feature 45 works by major twentieth century artists, set on approximately 168 acres of carefully landscaped grounds.

Recycling

- PepsiCo recycles office materials and containers from beverages consumed by employees. The containers are donated to a local school and the deposit money is used to support its music program.
- The Corporate Headquarters has had an active recycling program since 1988, collecting beverage containers, office paper and corrugated boxes.
- In 1994, the company became a charter participant of the EPA WasteWise Program.
- Every employee has a personal recycling bin.
- To help close the loop, PepsiCo and Pepsi-Cola are heavy users of recycled paper for publications and correspondence. Cardboard boxes are reused before recycling. Employees use returnable plastic cafeteria trays for take-out meals, rather than cardboard. Trays are collected on each floor. Recycling bins are on each floor for beverage containers.

Garden Maintenance

The gardens require normal maintenance, such as removal of trees, pruning dead wood, shaping trees and shrubs, cutting the turf, improving the soil, applying fertilizers and mulching. In order to be environmentally sound as well as reduce costs, the maintenance team has several initiatives:

Composting

- Chipping: All tree and shrub removals and branches pruned are chipped and composted, eliminating hauling them away to a landfill.

Fertilizers

- In 1992, PepsiCo switched to the use of slow release fertilizers for most applications. Since 1994, the company has been using the organic fertilizer, Sustane, which is made from turkey litter. This is applied to all turf and shrubs.

Pesticides

- The company has reduced the use of pesticides by using an integrated pest management approach. Pesticides are only applied when there is a problem, versus scheduled, regular spraying. Those pesticides that are used are surfactants, i.e. horticultural oils, and have high Ld50's (low mammalian toxicity), whenever possible. Alternative methods, such as bacteria that attack caterpillars, are also used whenever feasible.

Water

- PepsiCo has updated and modernized the irrigation system, including computerized control of water and new distribution systems. The result has been a system that better distributes water when and where it is needed. For example, lawns are not automatically watered when it rains.

Air Quality and Energy Usage

- Electric lighting now accounts for about 25% of the electricity used in the United States. EPA studies show that more than half of that amount is wasted in inefficient technology and maintenance practices. Under a renovation program, PepsiCo installed more efficient light bulbs throughout its headquarters.
- PepsiCo Headquarters replaced existing type T12 fluorescent light bulbs with more efficient T8 fluorescent light bulbs, saving 31 kwh/year per fixture. The total savings is more than 1.2 million kwh.
- PepsiCo Headquarters replaced magnetic ballasts with electronic ballasts and 40-watt bulbs with 35-watt energy efficient bulbs. This resulted in a significant reduction in electricity usage.
- The EPA estimates that every kilowatt hour of electricity not used prevents the emission of 1.5 pounds of carbon dioxide, 5.8 grams of sulfur dioxide and 2.5 grams of nitrogen oxides. Carbon dioxide contributes to global warming. Sulfur dioxide causes acid rain and nitrogen oxides result in acid rain and smog.
- PepsiCo has achieved significant reductions since the program's inception. PepsiCo has saved some 6.4 million kilowatts of electricity. This means that about 8.2 million pounds of carbon dioxide, 27.4 million grams of sulfur dioxide and 11 million grams of nitrogen oxides have not been released into the air.
- PepsiCo is a member of MetroPool's Leadership Circle. MetroPool is a non-profit commuter transportation service that seeks to reduce auto use by encouraging commuters to share rides. PepsiCo has been recognized for its commitment to MetroPool's programs.

Environmental "Due Diligence"

- Throughout PepsiCo, prior to any land or building acquisition, a corporate legal team applies "due diligence" to uncover any environmental liabilities. If needed, the team determines corrective action so the site can be brought up to environmental specifications.



PepsiCo has had an active recycling program since 1988.

Environmental programs at the Donald M. Kendall Sculpture Gardens include composting, fertilizers, pesticides and water use.

**The PepsiCo
Foundation
encourages employee
involvement in
environmental efforts.**

Recent PepsiCo Environmental Awards

EPA Sustained Leader in Waste
Prevention

Canada Haight Packaging Award

Plano Community Award

United Kingdom National
Business Energy Award

United Kingdom Good Practice
Case Study

Westchester Recycling Award

City of Dallas Blue Thumb Award

EPA Commuter Choice Employers
Champion

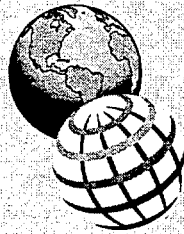
State of Connecticut Green Circle
Award

California - Waste Reduction
Awards Program (WRAP)
winner (5 years)

Prepared by
PepsiCo Public Affairs
PepsiCo, Inc.
Purchase, NY 10577
(914) 253-3122

Philanthropic Activities

- The PepsiCo Foundation has provided financial support to a number of environmental organizations. The Foundation has underwritten the Youth Forest Camps at George Washington National Forest in Augusta, Virginia, a project of the National Forest Foundation. The Westchester Land Trust and New York Botanical Gardens have also received PepsiCo Foundation Grants.
- In addition to direct grants, the Foundation encourages employees to get involved with civic and community organizations, including those focused on the environment.
- PepsiCo sponsors volunteer events for employees, providing paid time away from work during which employees clean up, rebuild and improve local areas. For example, in 2001, PepsiCo employees, working with volunteers from City Year, cleaned up and rebuilt a local historical trail.
- The Foundation matches employee gifts to non-profit groups, including environmental groups and double-matches when employees contribute their personal time.



What You Can Do!

We are pleased to offer you the opportunity to recycle by designing our consumer packaging to be recyclable. But it's up to you to finish the job. Please dispose of all the containers you buy properly and recycle them.

Together We Can Make A Difference By...

- Sorting your recyclables from the rest of your trash.
- Using your curbside recycling bins.
- Returning your recyclables to drop-off centers.
- Reminding your family, friends and neighbors that recycling is easy and important.
- Volunteering in or starting community clean-up programs.
- Remembering when on the go—at work, school or play—to seek out a recycling bin for recyclables or, to bring them home for proper disposal.
- Reusing paper and plastic bags where possible.
- Making wise choices regarding packaged products when shopping.
- Properly disposing of household hazardous waste.
- Serving as an example.



Real Assets Investment Management Inc.

Suite 801 1166 Alberni Street

Vancouver BC

Canada V6E 3Z3

Tel 604 646 5850

Fax 604 608 1908

Toll Free 1 866 646 5850

Web www.realassets.ca

DC

VIA FEDERAL EXPRESS

January 16, 2003

Office of the Chief Counsel
Division of Corporate Finance
Securities and Exchange Commission
Judiciary Plaza
450 Fifth Street, NW
Washington, D.C. 20549

RE: Response to December 26, 2002 Request by PepsiCo, Inc. For "No Action" Letter (File No. 1-1183)

Dear Madam or Sir:

Real Assets Investment Management and Trillium Asset Management (the "Proponents") have prepared this response to PepsiCo, Inc.'s (the "Company") letter dated December 26, 2002 indicating the Company's intention to omit the shareholder resolution entitled "PepsiCo Report on Business Risks Linked to Water Uses" (the "Proposal") from its proxy materials. The Company requests a "no action" letter on the basis that the Proposal is moot, arguing that the Company has "substantially implemented" the action requested. The Proponents disagree that the Company has "substantially implemented" the essential objectives of the Proposal, and thus do not believe the Company has a basis to omit the Proposal from its proxy materials under Rule 14a-8(i)(10). We respectfully request that the staff of the Division of Corporation Finance reject the Company's challenge and allow shareholders to vote on the Proposal, which seeks to address key policy considerations and strategic business risks facing the Company.

In its letter dated December 26, 2002, the Company argues that the Proposal is moot because the company has "substantially implemented" the action requested. According to the company, "To be substantially implemented and therefore moot, the proposal need not be implemented in its entirety. Rather, the standard is whether the company's particular policies, practices and procedures compare with those in the proposal." Summarizing past decisions by the SEC, the Company goes on to state "Where the company has already established policies and procedures that relate to the subject matter of the proposal, or where the company has implemented the essential objectives of the proposal, the Staff has regularly found that such proposal has been substantially implemented under Rule 14a-8(i)(10)." The Company



then quotes extensively from its November 2002 Environmental Commitment report, arguing that its selective anecdotes of various ad hoc water conservation efforts are sufficient to demonstrate that it has “substantially implemented” the essential objectives of the Proposal.

The Proponents will argue that the Company’s anecdotal information on ad hoc water conservation efforts does not “substantially implement” the action requested in the Proposal. The Proposal does not relate to water conservation per se, rather the Proposal seeks the preparation of a report “evaluating the business risks linked to water-uses and impacts throughout our company’s supply chain.” (The Proposal is included as Attachment A.). The Company has not provided adequate evidence of policies and procedures that relate to the evaluation of the business risks associated with water uses and impacts. Indeed, to decide in favor of PepsiCo would require a new and much lower standard for “substantial implementation”, one that would permit companies whose policies, procedures and practices bear only a superficial resemblance to the subject matter of the proposal to omit shareholder proposals from their proxy materials. On its face, “superficial resemblance” is not an appropriate test for “substantial implementation.”

Below we describe in more detail both the growing significance of the business risks associated with global water scarcity, and the inadequacy of the information provided by the Company to demonstrate “substantial implementation” of the Proposal.

Significant Business Risks Posed by Global Water Scarcity

The Company, and its shareholders, face dramatic new challenges and business risks as governments, local communities, activists, the media, and the public become increasingly aware of the growing crisis of water scarcity in many regions of the world. According to the United Nations: “About one-third of the world’s population lives in countries with moderate to high water stress. The problems are most acute in Africa and West Asia but *lack of water is already a major constraint to industrial and socio-economic growth in many other areas, including China, India and Indonesia.* If present consumption patterns continue, two out of every three persons on Earth will live in water-stressed conditions by the year 2025. The declining state of the world’s freshwater resources, in terms of quantity and quality, may prove to be the dominant issue on the environment and development agenda of the coming century.” (Emphasis added). (<http://freshwater.unep.net/>).

Given the critical role water plays as an input to many of PepsiCo’s core products, including its fast growing bottled water brands, the issue of water scarcity could pose a number of new significant business risks for the company, including higher costs, barriers to expansion, community opposition, and brand and reputation risk. The following illustrative examples herald the growing importance of water uses and impacts as a key factor in the Company’s business environment:

- On November 26, 2002, the United Nations Committee on Economic, Social, and Cultural Rights adopted a general comment on the right to water referring to article 11 of the International Covenant on Economic, Social and Cultural Rights. The General Comment states that: “The human right to drinking water is fundamental for life and health. Sufficient and safe drinking water is a precondition for the realization of all human rights.” The Comment defines the

sufficiency, safety, affordability and accessibility to water - and describes the State's legal responsibility in fulfilling the right. The human right to water entitles everyone to sufficient, affordable, physically accessible, safe and acceptable water for personal and domestic uses. It also notes that water should not be viewed "primarily as an economic good". (<http://www.citizen.org/documents/therightowater.pdf>).

- Coca-Cola, one of the Company's strongest global competitors, has identified water scarcity and sustainable water use as a high strategic priority. Coca-Cola has not only conveyed to the Proponents a deep understanding of its challenges relating to water, but has also signaled its commitment to addressing this emerging business risk by sharing with the Proponents plans, training materials, and internal operational targets. Coca-Cola has also indicated that it plans to release a report later this year that will incorporate a specific discussion of water-related business risks as well as information on key performance indicators and goals. (On the basis of these conversations Real Assets Investment Management Inc. intends voluntarily to withdraw a shareholder proposal filed with Coca-Cola similar in content to the Proposal under discussion here.) That the Company's main competitor is investing substantial resources in proactively addressing the water issue serves to establish the significance of water-related business risks in the Company's industry.
- The Company's competitor Nestle Waters North America is engaged in court proceedings with a local citizens' group over a proposed bottling operation in Michigan, which seeks to overturn a permit the company has to extract local groundwater for bottling. (*BusinessWeek*, May 27, 2002).
- Maude Barlow, a widely cited Canadian activist on water issues, wrote in *The Nation* last year: "The bottled-water industry is one of the fastest-growing and least regulated industries in the world, expanding at an annual rate of 20 percent. Last year close to 90 billion liters of bottled water were sold around the world-most of it in nonreusable plastic containers, bringing in profits of \$22 billion to this highly polluting industry. Bottled-water companies like Nestle, Coca-Cola and Pepsi are engaged in a constant search for new water supplies to feed the insatiable appetite of this business. In rural communities all over the world, corporate interests are buying up farmlands, indigenous lands, wilderness tracts and whole water systems, then moving on when sources are depleted." (*The Nation*, Sept. 3, 2002). This quotation clearly indicates that PepsiCo faces potential reputational and brand risk at the hands of activists if it does not adequately address water-related issues.
- A new report from well-known water expert Peter Gleick, director of the independent Pacific Institute for Studies in Development, Environment and Security, notes that "In the water community, the concept of water as an 'economic good' has become the focal point of contention. In the last decade, the idea that fresh water should be increasingly subject to the rules and power of markets, prices, and international trading regimes have been put in practice in dozens of ways in hundreds of places, affecting millions of people. *Prices have been set for water previously provided for free.*" (Emphasis added.). (Gleick et al., *The New Economy of Water: The Risks and Benefits of Globalization and Privatization of Water*, February 2002. This document is available for download at http://www.pacinst.org/reports/new_economy.htm). This

quotation provides evidence that the economics of water are changing. The long-term trend toward higher prices for water poses a direct business risk to the Company in terms of increasing the Company's cost of goods sold potentially leading to decreased margins, and, ultimately, lower profitability.

It is the Proponents' belief that the Company must put in place – and disclose – strategic, systematic, and corporate-wide water use policies and practices to adapt to the changing business landscape of an increasingly water-scarce world and to withstand growing public scrutiny in the future.

Inadequacy of Current Reporting

The Company argues that its November 2002 Environmental Commitment report demonstrates that it has met the essential objective of the Proposal. This argument is founded upon a misconception, which is that the essential objective of the Proposal is to gain further information about the Company's water conservation efforts. However, the subject matter of Proposal is not water conservation as such, but rather the preparation of a report "evaluating the business risks linked to water-uses and impacts throughout our company's supply chain." The Company manifestly has not met this objective.

To illustrate the distinction between ad hoc water conservation initiatives, which the Company has undertaken and reported upon, and a systematic evaluation of strategic business risks associated with water uses and impacts, which the company has not reported on and appears not to have undertaken, it is worth turning to the framework put forward by the business members of the Global Environmental Management Initiative (GEMI) in their June 2002 document entitled *Connecting the Drops Toward Creative Water Strategies: A Water Sustainability Tool*. (This document is included as Attachment B.). It is important to emphasize that GEMI is an industry coalition made up of major corporations.¹ The components of this tool, summarized below, offer guidance – *from within the business community itself* – as to what an appropriate evaluation of the business risks linked to water-uses and impacts would entail. According to the major corporations composing GEMI, the following are the kinds of questions that need to be asked and the steps that need to be taken by any company seeking to evaluate – and mitigate – its water-related business risks:

- **A systematic assessment of the Company's impacts and used of water across its operations.** The GEMI document discusses three steps any company must take to provide adequate information to assess and manage the business risks associated with water: 1)

¹ The member companies are: 3M; Abbott Laboratories; Anheuser-Busch Inc.; Ashland Inc.; Bristol-Myers Squibb Company; Burlington Northern and Santa Fe Railway Company; The Coca-Cola Company; ConAgra Foods; The Dow Chemical Company; Duke Energy; DuPont; Eastman Kodak Company; Eli Lilly and Company; FedEx; General Motors Corporation; Georgia-Pacific Corporation; The Goodyear Tire & Rubber Company; Halliburton Company; Hewlett-Packard Company; Intel Corporation; Johnson & Johnson; Johnson Controls, Inc.; Koch Industries, Inc.; Lockheed Martin Corporation; Merck & Company, Inc.; Mirant Corporation; Motorola, Inc.; Novartis Corporation; Occidental Petroleum Corporation; Olin Corporation; Pfizer Inc; Pharmacia Corporation; Philip Morris companies; Pitney Bowes Inc.; The Procter & Gamble Company; Southern Company; Temple-Inland Inc.; Texas Instruments Incorporated; Wyeth.

identify and characterize in what ways the company directly or indirectly uses water at each stage in the value chain; 2) identify and characterize the ways in which the organization impacts surfacewater and/or groundwater through activities at each stage of the value chain, e.g. through water discharges or the release of water-borne pollutants; and, finally 3) identify water sources (What are the primary water sources used by the Company?) as well as assess these sources (To what extent is the water source under stress? To what extent does the business affect this source through its water use or impacts?). This is only common sense. A company cannot determine how it will be affected by water-related issues without a thorough inventory of how the company's operations impact on water and how water issues might impact on operations. But however self-evident this logic might appear, we can find no evidence in the Company's November 2002 Environmental Commitment report that the Company has undertaken any of these steps, nor any comparable systematic evaluation of its water uses and impacts.

- **Assessment of Business Risks and Opportunities.** The major corporations behind the GEMI report also indicate that companies should ask how sensitive their financial and operating performance might be to different water-related scenarios. This would involve the evaluation of a variety of plausible alternative water-related developments and their likely impact on company operations, for instance changes in water price, availability, quality, or the loss of a particular water source. Similarly, a company should consider how sensitive it is to changes in externally imposed requirements concerning its water impacts. Finally, a company would consider this information and prioritize its water-related risks. The business leaders who drafted the GEMI report also recommend that a similar exercise be conducted vis-à-vis business opportunities, such as the possibility of creating value through increasing revenue, reducing costs, or enhancing corporate goodwill through addressing broader community water needs. These steps can be considered the *sine qua non* of an evaluation of business risks related to water uses and impacts, which is the subject matter of the Proposal. There is no evidence provided in the Company's November 2002 Environmental Commitment report to indicate that any of these steps has been undertaken, nor any comparable systematic evaluation of the company's water-related risks and opportunities. The Proposal requests just such an evaluation of business risks, and the failure of the Company's November 2002 Environmental Commitment report to raise such issues in any form demonstrates that the Company has failed the "substantial implementation" test.
- **Developing and Implementing Strategy and Implementing Goals.** Once a company has developed a list of water uses and impacts and a set of priorities for reducing water-related risks and maximizing water-related opportunities, the corporate leaders who authored the GEMI framework advise companies to develop the business case for action, set goals, implement a selected strategic direction, and monitor performance. As the Company points out in its letter dated December 26th, 2002, the various business units of PepsiCo have undertaken a variety of ad hoc water-related initiatives. But there is no evidence to suggest that these ad hoc initiatives have been undertaken in the context of a corporate-level strategy, that concrete goals have been set, or that performance measurement and management systems are in place to assure shareholders that these goals are being achieved. For example, some of

the reported results are vaguely worded and unverifiable (“Pepsi-Cola plants are increasingly designed to avoid burdening municipal wastewater treatment systems and reduce our use of water”); the performance metrics chosen for reporting purposes vary widely both geographically and by business unit; and some units do not report any water-related activities at all (Quaker Oats). Clearly, this is not a company that has conducted an “evaluation of business risks linked to water-uses and impacts throughout the company’s supply chain,” a report on which is the essential objective requested in the Proposal.

In describing the GEMI framework on sustainable water strategies at some length, the Proponents are not seeking to detail in a prescriptive sense a particular course of action that the Company must fulfill in order to meet the objectives of the Proposal. Rather, the GEMI framework, drafted by major actors within the corporate community, serves to answer the question “what would reasonable business actors today understand by the phrase “an evaluation of the business risks associated with water uses and impacts?”. The natural conclusion upon reviewing this material is that the anecdotal information on ad hoc water conservation efforts contained in the Company’s November 2002 Environmental Commitment report does not constitute an adequate evaluation of the business risks associated with water uses and impacts. Indeed, not only does this report fall short, it offers *no evidence at all* that even a single element of an evaluation of the business risks associated with water uses and impacts has been undertaken by the Company.

Conclusion

The Proposal requests that the Company’s board prepare a report to shareholders evaluating the business risks linked to water uses and impacts throughout the company’s supply chain, including subsidiaries and bottling partners. The Proponents acknowledge that the Company’s Environmental Commitment report released in November 2002 includes some information about its business units’ water conservation efforts. However, the anecdotal information included in the Environmental Commitment report does *not* provide evidence that the Company has undertaken a strategic or systematic assessment of the significant new business risks and challenges arising from growing global water scarcity, which is the essential objective of the Proposal. Thus, the Proposal is not moot and the Company should not be permitted to omit the Proposal from its annual proxy materials.

The Company has manifestly failed to demonstrate that it has “substantially implemented” the Proposal. Instead, it has shown that its policies, practices, and procedures bear a *surface similarity* to the subject matter of the Proposal and has argued – in effect – that this “superficial resemblance” is sufficient to meet the “substantial implementation” test. In the Proponents’ view, “superficial resemblance” is not an appropriate standard for “substantial implementation” under Rule 14a-8(i)(10). Indeed, for the SEC to rule on PepsiCo’s behalf in this matter would be to set a new precedent, one that held that the cursory and casual treatment of the subject matter of a proposal is sufficient to render that proposal moot. In the Proponents’ view this would represent a loosening of the “substantial implementation” standard and would offer companies much greater latitude in the future to exclude shareholder proposals under Rule 14a-8(i)(10). In effect, the SEC would be extending an invitation to companies to challenge shareholder proposals hitherto deemed legitimate. Such a decision appears untimely in this era of increased shareholder anxiety over standards of corporate governance and business ethics.

Given rapidly evolving public concerns over water-related issues, the evidence offered above that water-related risks to the Company are growing, and the fact that these risks are particularly germane to the Company's current and future profitability due to its unique product mix, the Proponents contend that this issue is critically important to investors, and that shareholders should have the opportunity to consider the Proposal on its merits. Therefore, we respectfully request that the Commission not accede to the Company's request to sanction the omission of the Proposal from its proxy materials. If you have any further questions on this matter, please contact Kai Alderson at 604-646-5860.

Sincerely,
REAL ASSETS INVESTMENT MANAGEMENT INC.



Kai Alderson
VP, Social Research

Enclosures.

cc.

Robert E. Cox
Vice President, Associate General Counsel and Assistant Secretary
PepsiCo
700 Anderson Hill Road
Purchase, NY 10577-1444

Elaine Palmer
Manager of Corporate Information
PepsiCo
700 Anderson Hill Road
Purchase, NY 10577-1444

Steve Lippman
Senior Social Research Analyst
Trillium Asset Management Corporation
369 Pine Street, Suite 711
San Francisco, CA 94104-3314

PEPSICO REPORT ON BUSINESS RISKS LINKED TO WATER USES

Whereas,

The business case for developing long-term corporate water use strategies has never been stronger (GEMI, 2002):

- Total water costs are increasing in unexpected ways;
- Risks of business disruption due to water-related issues are increasing;
- Customer expectations relating to water use and impacts are evolving; and,
- Businesses' "license to operate" and ability to expand are increasingly tied to water-related performance

Scientists predict that water use for households, industry, and agriculture will increase by at least 50% over the next twenty years, leading to greater competition for water resources and, potentially, higher water prices (IFPRI & IWMI, 2002).

Industrial water users are likely to face changes in water-related regulatory regimes that may lead either to price increases or supply constraints or both. Currently more than 1 billion people around the world do not have access to a safe water supply. World leaders agreed at the World Summit on Sustainable Development in Johannesburg to cut in half the number of people without access to clean water by 2015 (WSSD, 2002).

The bottled water industry is particularly exposed to reputation risks when disputes with local communities arise over water use. Competitors, such as Nestle Waters North America, are engaged in court proceedings with a local citizens' group over a proposed bottling operation in Michigan (BusinessWeek, 2002).

Bottled water makes up a small but fast-growing component of our company's product portfolio, further compounding the potential for brand risk if conflicts with local communities over water use issues were to increase.

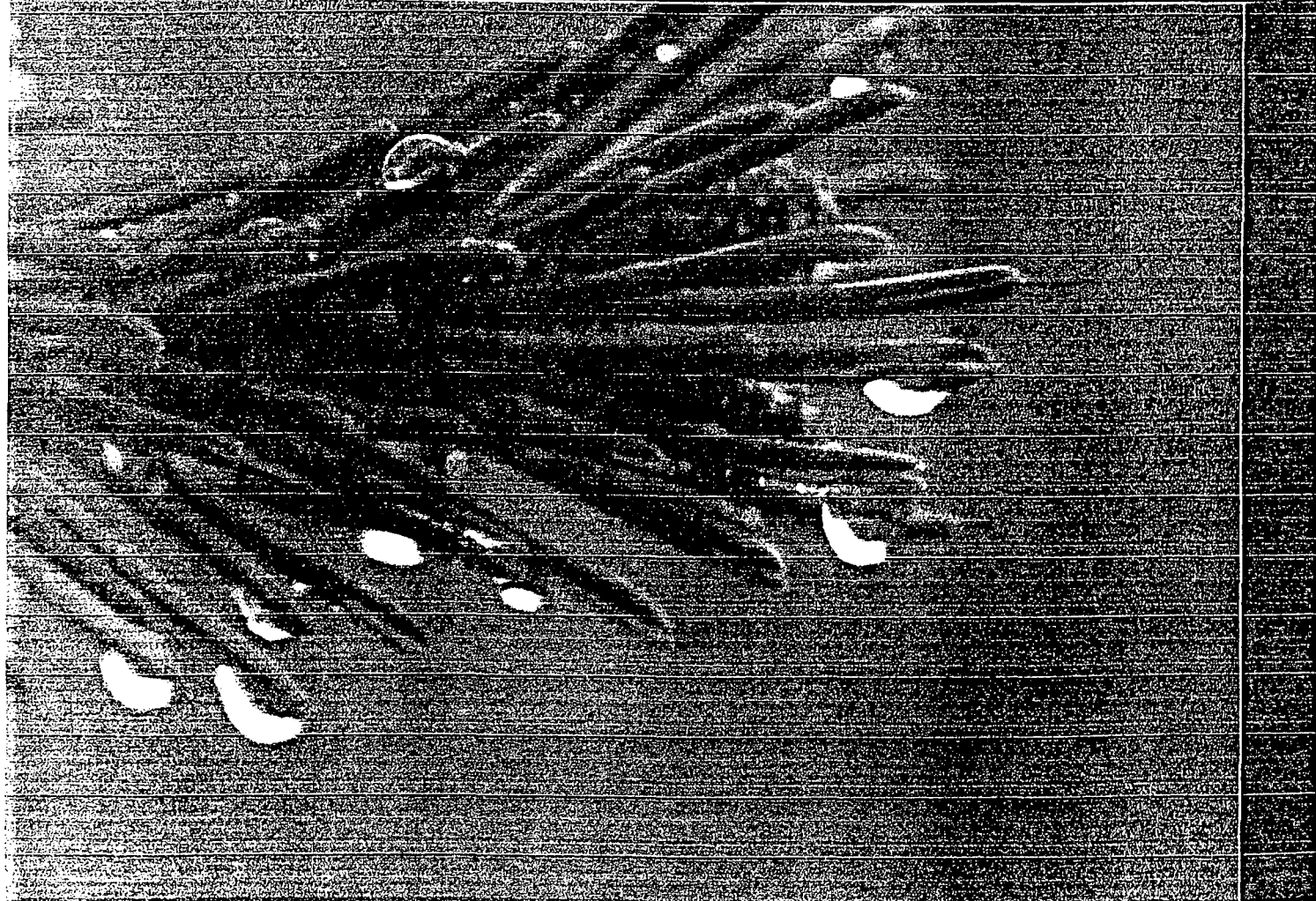
Therefore Be It Resolved, that the Board prepare a report to shareholders (at reasonable cost and omitting proprietary information) by September 2003 evaluating the business risks linked to water-uses and impacts throughout our company's supply chain, including subsidiaries and bottling partners, with special reference to our company's current policies and procedures for mitigating the impact of operations on local communities in areas of water scarcity.

Connecting the Drops Toward Creative Water Strategies

A Water Sustainability Tool



GEMI



About the Global Environmental Management Initiative

The Global Environmental Management Initiative (GEMI) is a non-profit organization of leading companies dedicated to fostering environmental, health, and safety excellence worldwide. Through the collaborative efforts of its members, GEMI also promotes a worldwide business ethic for environmental, health, and safety management and sustainable development through example and leadership.

The guidance included in this document is based on the professional judgment of the individual collaborators listed in the acknowledgements. The ideas in the document are those of the individual collaborators and not necessarily their organizations. Neither GEMI nor its consultants are responsible for any form of damage that may result



GEMI

from the application of the guidance contained in this document.

This document has been produced by GEMI and is solely the property of the organization. This document may not be reproduced without the express written permission of GEMI, except for use by member companies or for strictly educational purposes.

GEMI Member Companies

3M
Abbott Laboratories
Anheuser-Busch Inc.
Ashland Inc.
Bristol-Myers Squibb Company
Burlington Northern and Santa Fe Railway Company
The Coca-Cola Company
ConAgra Foods
The Dow Chemical Company
Duke Energy
DuPont
Eastman Kodak Company
Eli Lilly and Company
FedEx
General Motors Corporation
Georgia-Pacific Corporation
The Goodyear Tire & Rubber Company
Halliburton Company
Hewlett-Packard Company
Intel Corporation

Johnson & Johnson
Johnson Controls, Inc.
Koch Industries, Inc.
Lockheed Martin Corporation
Merck & Company, Inc.
Mirant Corporation
Motorola, Inc.
Novartis Corporation
Occidental Petroleum Corporation
Olin Corporation
Pfizer Inc.
Pharmacia Corporation
Philip Morris companies
Pitney Bowes Inc.
The Procter & Gamble Company
Southern Company
Temple-Inland Inc.
Texas Instruments Incorporated
Wyeth

Preface

.....

June 2002

Dear friend,

There are emerging signals, some strong, some faint, that the business case is building for companies to develop more coordinated and forward-looking water strategies. Water costs are increasing, business disruption risks are growing, and stakeholders are becoming more concerned about companies' water-related performance. Global demand for freshwater continues to grow, while many water sources are showing signs of stress such as rising pollutant levels or withdrawal rates that exceed replenishment rates. While these trends do not affect all companies and geographic regions equally, these signals are likely to grow stronger in the coming years. Companies that understand the trends shaping the global business environment will be better positioned to identify new market opportunities, mitigate risk, develop sustainable water strategies, and create shareholder value.

Freshwater availability and quality are not just issues for business. Perhaps more than any other issue, freshwater stands out as a sustainability challenge. Businesses, communities, and ecosystems everywhere depend on clean freshwater to survive and prosper. When water needs in one area—economic, social, or environmental—become threatened, the risks to all increase.

Balancing competing water needs requires creative, collaborative, and coordinated management. Companies need to think in new ways, listen closely to critical customers, and innovate. Water resources can be managed more efficiently within the factories, fields, and other places where businesses operate. Businesses are finding benefits in taking steps beyond their fence lines to address water challenges. Partnerships with local communities, investments in source water protection, and supply chain initiatives offer promising results. In addition, significant business opportunity lies in assuring that people, ecosystems, agriculture, and industry have sufficient access to clean freshwater into the future. Those companies that listen to the signals and find ways to meet global and local water sustainability needs will increasingly create shareholder value and competitive advantage.

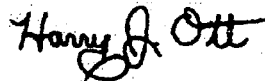
GEMI's Water Sustainability Work Group has developed this tool to help you better understand and guide your own organization's relationship to water. The five steps, or modules, in this tool assist you to identify water-related opportunities and risks, determine the business case for action, and engage your organization—whether it is a department, facility, or company—in developing and implementing an effective water strategy. Case studies demonstrate how several of our companies have reduced risk and created significant business value through coordinated action. Sections on common challenges, water trends, and perspectives on water sustainability provide additional guidance and context. GEMI has also developed a companion website (www.gemi.org/water) with additional resources to help you use this tool.

As Ben Franklin wrote in *Poor Richard's Almanac* in 1746, "When the well is dry, we learn the worth of water." We believe it is within our collective ability to design a future of opportunity in which the well is full for all.

Sincerely,



Paul S. Halberstadt
ConAgra Foods



Harry J. Ott
The Coca-Cola Company

Co-Chairs, GEMI Water Sustainability Work Group

■ Connecting the Drops Toward Creative Water Strategies

A Water Sustainability Tool

Acknowledgements

This guidance document was developed in a collaborative process by the Global Environmental Management Initiative's (GEMI) Water Sustainability Work Group. Paul Halberstadt of ConAgra Foods and Harry Ott of The Coca-Cola Company co-chaired the project. The document was developed by Danny Consenstein and Tim Larson of Ross & Associates Environmental Consulting, Ltd. with guidance from Rob Greenwood and Martha Prothro. Additional research, writing, and editing was contributed by Anne Dettelbach, Todd Roufs, and Dan Stonington. Amy Goldman and Steve Hellem of GEMI provided substantial input and support to the project.

Graphic design: Todd Roufs

Cover photo: Courtesy of Eastman Kodak Company

Contributing GEMI Water Sustainability Work Group Members

Robert Accarino, Abbott Laboratories
Marcio Amazonas, The Coca-Cola Company
Audrey Bamberger, Anheuser-Busch Inc.
Dan Barthold, Miller Brewing Company
Alex Beehler, Koch Industries, Inc.
Carol Cala, Eastman Kodak Company
Stan Christian, Motorola, Inc.
Al Collins, Occidental International
Tom Cooper, Intel Corporation
Terry Cullum, General Motors Corporation
Jeff Forgang, Duke Energy

Paul Gowen, Texas Instruments Incorporated
Rich Guimond, Motorola, Inc.
John Harris, Ashland Inc.
Robert Harris, ConAgra Foods
Jim Kearney, Bristol-Myers Squibb Company
John Kindervater, Eli Lilly and Company
Bill Lechner, Abbott Laboratories
Mayda Martinez, Merck & Company, Inc.
Dean Miracle, Southern Company—Georgia Power
Ed Mongan, DuPont
Leslie Montgomery, Southern Company
Scott D. Noesen, The Dow Chemical Company
Vivian Pai, Johnson & Johnson
Elsie Rivera Palabrica, Abbott Laboratories
Mary Beth Parker, Mirant Corporation
Milton Perez, Pharmacia Corporation
Don Radentz, ConAgra Frozen Prepared Foods
Ted Reichelt, Intel Corporation
Curt Richards, Olin Corporation
Walt Rosenberg, Hewlett-Packard Company
Bert Share, Anheuser-Busch Inc.
T. Mayes Stark, Georgia-Pacific Corporation
John Stein, Anheuser-Busch Inc.
Bill Sugar, Anheuser-Busch Inc.
Jim Thomas, Novartis Corporation
Robin Tollett, The Procter & Gamble Company
Terry Welch, The Dow Chemical Company
Jeff Werwie, Johnson Controls, Inc.
Darwin Wika, DuPont
Carl Wirdak, Occidental Petroleum Corporation
Pat Wood, Georgia-Pacific Corporation
Keith Zook, The Procter & Gamble Company

Contents

The Business Case for Pursuing Water Sustainability: New Opportunities, New Risks	1
Tool Overview	5
Module 1: Water Use, Impact, and Source Assessment	9
Module 2: Business Risk Assessment	15
Module 3: Business Opportunity Assessment	21
Module 4: Strategic Direction and Goal Setting	27
Module 5: Strategy Development and Implementation	33
Overcoming Challenges on the Path to Water Sustainability	37
Water Trends	41
Moving Forward	47
Perspectives on Water Sustainability	49

Case Studies

Exploring Water Connections Along the Supply Chain Anheuser-Busch Inc.	12
Looking Down the Value Chain: Recognizing the Importance of Water to Consumers The Procter and Gamble Company	12
Using a "Water Balance" to Identify and Characterize Water Uses Texas Instruments Incorporated	13
Using Source Protection Planning to Identify Source Vulnerabilities The Coca-Cola Company	18
Managing Strategic Risk Through Innovative Wastewater Treatment DuPont	19
Reducing Facility Costs with Water Reuse and Recycling Abbott Laboratories	24
Redesigning Facility Water Use: A Watershed Management and Water Reuse Initiative Bristol-Myers Squibb Company	24
Developing Services to Address Customers' Water Conservation Needs ConAgra Foods	24
Using Best Management Practices to Improve Water Quality Eastman Kodak Company	25
Building on Core Competencies to Expand Markets Johnson Controls, Inc.	25
Cutting Costs by Recycling Materials from the Water Waste Stream Olin Corporation	26
Finding Solutions to Watershed Issues Through Effective Cooperation with Stakeholders Southern Company	26
Using Performance Goals to Focus Organizational Attention to Water Sustainability Georgia-Pacific Corporation	31
Engaging Corporate-Level Support for Plant-Level Water Initiatives Intel Corporation	31
Engaging Employees to Reduce Water Use and Impacts Novartis Corporation	32
Engaging the Organization in Water Strategy Implementation Anheuser-Busch Inc.	36
Tracking Water Performance: Metering and Metrics DuPont	36

This page intentionally left blank

The Business Case for Pursuing Water Sustainability: New Opportunities, New Risks

As business leaders plan for the future, they scan for opportunities and risks created by emerging trends that may impact their company, industry, customers, and the world. There are now signals, some faint, some strong, that water is emerging as an issue of strategic importance to business.

Over the past several decades, many businesses have improved the efficiency of water use and reduced the discharge of pollutants to surfacewaters and aquifers. In fact, in some areas, despite increases in population and economic activity, freshwater consumption has dropped since 1980 in response to water conservation, reuse, recycling efforts, and changing priorities for water use. Following such successes, many companies are taking a renewed—and more coordinated—look at their relationship to water and seeing both expanding opportunities and heightening risks.

New Signals, New Opportunities, New Risks

The business case for strategically addressing water challenges is getting stronger. While each organization must assess the business case arising from its own relationship to water risks and opportunities, companies are increasingly encountering four strategic water signals that the business case to address water issues is building in

“The Coca-Cola Company exists to benefit and refresh everyone it touches. Access to fresh water is key to our continued success. We work every day to manage water resources responsibly for our consumers and the communities we serve. As such, we have an ongoing commitment to clean water to sustain healthy individuals, healthy families, healthy businesses, healthy communities, and healthy ecosystems.”

*Douglas N. Daft, Chairman, Board of Directors, and Chief Executive Officer,
The Coca-Cola Company*

Business Case

multiple industry sectors. Business benchmarking and case studies conducted as part of this effort are evidence that these signals are growing in strength and frequency.¹

Signal 1: Total water costs are increasing in unexpected ways.

Businesses are experiencing increases in water-related costs, not only those reflected in direct prices. In fact, water prices in many locations fail to accurately represent shifting supply and demand for water. Other direct and indirect water-related costs have emerged or risen in both industrialized and developing countries, including:

- Treatment costs to ensure that water inputs meet the business' quality specifications
- Wastewater treatment and pollution mitigation costs to meet more stringent pollutant discharge and run-off standards as regulatory approaches shift from technology-based requirements to watershed health-based limits and levels necessary to support endangered species protection and restoration efforts
- Supply expansion costs associated with dam construction, water diversion, well drilling, and securing new water allocations
- Indirect costs from suppliers with water-intensive processes or significant water impacts
- Worker absenteeism costs stemming from employee contraction of water-borne illnesses

Signal 2: Business disruption risks are growing. Current water "allocations" are not assured into the future.

Many companies now realize that even greater risks lie in the potential for water-related constraints

on business activity. Current "allocations" of water rights for use and for discharge of pollutants are not assured into the future. In many regions of the world, pressures are growing to give higher priority to ecosystem and basic human needs for water. Changing local water supply and quality levels, combined with increasing competition for clean, freshwater resources, make past allocations vulnerable to disruption and revision. Businesses lacking contingency plans and failing to take proactive steps to address facility and local water challenges may find it difficult to avoid or respond quickly to surprises. Potential water-related business risks include:

- Water supply disruptions due to temporary or chronic water shortages, infrastructure deterioration, surface and groundwater contamination, or terrorist activity
- Pressures to change water allocations to address other industrial, agricultural, residential, and ecosystem needs, particularly in times of tight supply
- Supplier disruptions from water shortages in other regions, particularly those affecting energy and agricultural inputs
- Opposition to proposed facility siting or expansion stemming from existing or anticipated company or community water uses or impacts
- Public opposition to or government prohibitions against certain wastewater discharge techniques or certain types of water quality impacts

Signal 3: Customer expectations related to water use and impacts are evolving.

GEMI member companies report that they are increasingly hearing from customers—shareholders and those who buy a company's products and

services—about the growing importance of water issues. Failure to understand evolving customer expectations can affect a company's bottom-line performance. Increasing water-related costs throughout the value chain can affect product costs and pricing, reducing product or service demand. Many publicly traded companies are experiencing shareholder initiatives aimed at corporate environmental performance or decision-making. Such initiatives and associated shareholder expectations can create pressure for a company to alter its water-related practices or strategic plans.

At the same time, some companies are finding ways to enhance revenues by applying core competencies to address water-related needs experienced by others, such as products that use less water or services that reduce customers' water dependency.

Signal 4: Businesses' "license to operate" and ability to expand are increasingly tied to water-related performance.

As public expectations shift to embrace concepts of sustainability, companies are also discovering that their definitions of critical customers may need broadening. Critical customers are no longer just shareholders and those who buy a company's products and services. They include those individuals and groups—financial markets, suppliers, neighbors, non-governmental organizations, and regulators—whose behavior or responsiveness a business depends on to maintain its "license to operate" and to deliver consistently increasing shareholder value. Addressing the water needs of a company's critical customers will require new thinking and more strategic approaches. For example, increased community awareness and recognition of local water challenges can alter public

acceptance of and support for a company's strategic plans or water-related practices.

Creating Business Value Through Water Sustainability

Business has a strategic opportunity to get out in front of water sustainability challenges before they impose constraints on business activity. Localized environmental issues of water availability and quality—that could often be "solved" through technical, policy, or behavioral approaches—are transforming, in many communities, into sustainability challenges that demand ongoing balancing efforts to satisfy competing needs. Balancing such demands on water resources will increasingly require thoughtful, collaborative management.

Case studies in this tool demonstrate how specific companies have recognized these strategic water signals, evaluated the business case for action, and taken steps to address the emerging challenges in ways that reduce risk, create shareholder value, and benefit the environment and others dependent on shared water resources.

Lessons from company experience, combined with advice from water experts, suggest several practical concepts that can guide efforts to manage water resources sustainably while creating shareholder value. While incorporating these concepts into company actions may not be practical in all situations, doing so frequently reduces risk, opens opportunities, and enhances water security.

Water Sustainability Concepts

- Consider local human and ecosystem water needs around shared water resources in business decision-making
- Reduce overall use of water
- Match water quality with appropriate use
- Minimize adverse impacts on water quality or improve the quality of available water
- Solve water quality challenges through prevention rather than treatment
- Engage local stakeholders in dialogue about water management challenges using a meaningful participation process
- Raise awareness about water sustainability and the importance of effective stewardship

Connecting the Drops: Building a Company Water Strategy that Fits

Individual companies face the challenge of understanding what all of these evolving water signals mean for them and what steps they should take. Each company has a different relationship to water throughout its value chain—from production inputs, raw materials, and suppliers to ultimate service or product use and disposition. Each company must assess its own business case for action. By understanding some of these signals early, companies may find paths that prevent future crises.

While water challenges persist at the local level, businesses are finding advantages in taking a more coordinated and strategic approach to addressing water challenges. Coordinated corporate attention to water challenges can support, promote, and

transfer successes across facilities and sites, while engaging multiple business functions in reducing water-related risks and pursuing value-adding opportunities. Historically, at many companies, water-related responsibilities have been divided among separate functions, such as facilities management, engineering, and environmental affairs, with ownership of overall strategic water considerations falling through the cracks. Leadership, however, can come from many places—and plant managers will undoubtedly have a growing responsibility to navigate facility operations through local water challenges.



GEMI has developed this tool, and a companion website (www.gemi.org/water), to help you “connect the drops” and build

a creative water strategy that fits your needs and circumstances. The tool and the website enable organizations to better understand their relationship to water throughout the value chain, identify opportunities and risks, assess the business case for action, and develop and implement continual improvement-based water strategies.

Tool Overview

GEMI has developed this analytical process—the Water Sustainability Tool—to assist individual companies and other organizations to better understand what emerging water issues might mean for them, given their operations, needs, and circumstances. The tool is designed to help individual companies build a business water strategy. The tool encourages businesses to:

- Conduct a systematic assessment of their relationship to water
- Identify specific opportunities and risks associated with this relationship
- Assess the business case for action
- Tailor a water strategy that addresses specific needs and circumstances of the organization
- Ensure that water-related opportunities and risks are tracked and managed effectively into the future using a continual improvement framework

The Tool Roadmap

GEMI's Water Sustainability Tool contains five core analytical stages, or modules. These include:

- Module 1: Water Use, Impact, and Source Assessment
- Module 2: Business Risk Assessment
- Module 3: Business Opportunity Assessment
- Module 4: Strategic Direction and Goal Setting
- Module 5: Strategy Development and Implementation

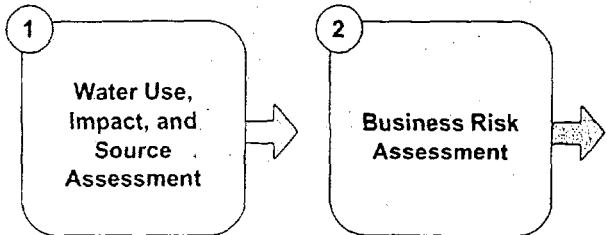
*Water opportunities
and risks are emerging
throughout companies'
value chains.*

Tool Overview

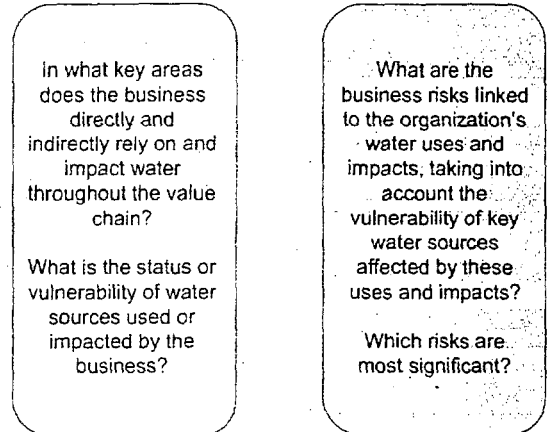
Water Sustainability Tool Roadmap

Current State Assessment

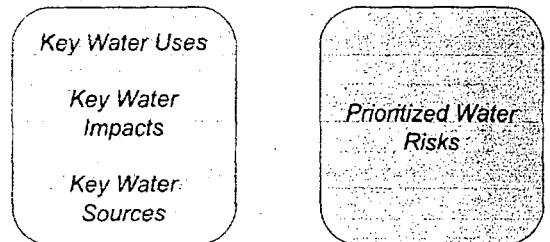
Modules



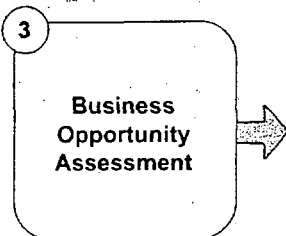
Key Questions



Outputs

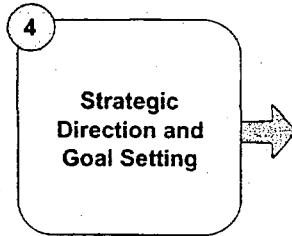


Consulting | Project | Risk | Compliance | Water | Sustainability



What opportunities exist to proactively address costs and potential risks to the business associated with water use and impacts?

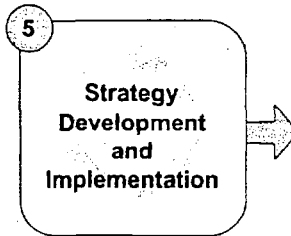
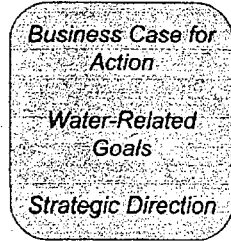
What opportunities exist to create "top line" business value by addressing water challenges faced by others?



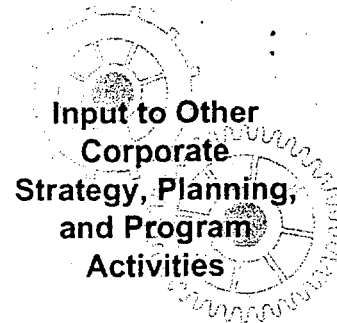
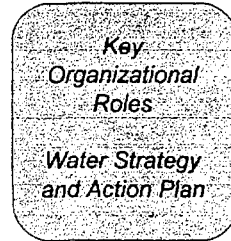
What business case exists for pursuing a water sustainability strategy?

What are the company's goals related to water sustainability?

How can the organization be best engaged in pursuing a water sustainability strategy?



What roles should various business functions play in developing and implementing the company water strategy?



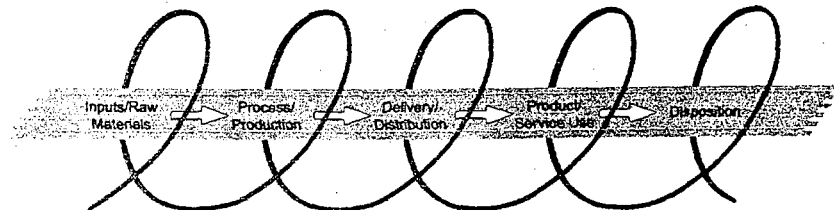
Each of the five analytical modules includes specific steps that can help answer the key questions associated with each module (see the tool roadmap diagram on the previous page for an overview of the modules, key questions, and outputs). Each module is supplemented by brief case studies that highlight how companies have approached the analytical steps. GEMI has also prepared a companion website to assist individuals in applying the analytical modules to their own companies or organizations. The icon to the left is used throughout this tool to indicate places where the user is encouraged to visit the website for more information. The website (www.gemi.org/water) includes the full content of this document, plus specific *Web Tool Resources*—key questions, checklists, forms, and additional case studies—to support tool users in applying each module. Web Tool Resources are listed under the analytical steps that they support.

Modules are sequenced to assist users in evaluating the business case and developing a strategy to address water challenges. The modules also can be used in an iterative manner. For example, the current state assessment modules (Modules 1 and 2) are designed to enable both a “first pass” assessment as well as a more detailed assessment that could be conducted at a later point. Users are encouraged to adapt this analytical framework to meet their company’s specific needs, taking into account steps that may have already been completed.

Focus on the Full Value Chain

Water opportunities and risks are emerging throughout companies’ value chains. For example, certain suppliers may be vulnerable to water supply availability risks that could impact a business’ costs or availability of key production inputs, from raw materials to energy. At the other end of the value chain, the use or final disposition of a company’s products or services could affect water resources in beneficial or detrimental ways. In order to help businesses consider upstream and downstream opportunities and risks related to water, this tool utilizes a five-stage value chain (or material flow chain). The value chain figure below presents the five value chain stages used for the current state assessment (Modules 1 and 2).

The value chain approach is designed to help companies identify and assess water uses and impacts in places where they might not be immediately obvious. For example, water-related risks and opportunities may appear in raw material or production stages, linked with key process inputs and suppliers, or in later stages, associated with product use or final disposition. Companies may find that they rely upon or impact water in unexpected ways.



Water Can Touch the Full Value Chain

Module 1: Water Use, Impact, and Source Assessment

Module Purpose

Understanding how a product, facility, or company is connected to water—through direct and indirect water use and through impacts to water from business activities and products—is the critical first step in determining how an organization should respond to water risks and opportunities in a sustainable manner. This module helps organizations answer the following questions:

- In what key areas does the business directly and indirectly rely on and impact water throughout the value chain?
- What is the status or vulnerability of water sources used or impacted by the business?

Water uses and impacts identified in this Module will be used to complete the risk assessment and prioritization in Module 2. Together, Modules 1 and 2 make it possible for each company to complete a current state assessment. Only after building an understanding of your current water uses, impacts and risks, can you begin to develop appropriate strategies to achieve your business goals.

Module Approach

For each stage in the value chain, the user should examine how water “flows” through the business activities in that area. Many companies using environmental management systems may have already identified water uses in the context of

Exploring water uses and impacts from a variety of approaches will help the user complete a comprehensive picture of a company's key connections to water.

Module 1



identifying environmental "aspects." The tool is intended to build on those assessments and focus on identifying additional direct and indirect water uses at other stages in each company's value chain.

Step 1: Identify and Characterize Water Uses

- In what ways does the organization directly and indirectly use water at each stage in the value chain?

> Identify Water Uses

By asking this question at each stage in a company's value chain, tool users are encouraged to think broadly about water use. Tool users should begin developing an understanding of key water uses at the company, from raw material or production stages, through customer use and final disposition. There are several areas of water use and reliance shared by many companies, such as facility landscaping, process heating/cooling, cleaning of parts during production, and transportation of materials. There are also areas of water use that are common to specific industry sectors. In addition, companies are often connected to water in very indirect, yet critical ways. These connections may be associated with the way your suppliers, employees, and customers use water. Each stage of the value chain also has unique water uses that are common to many companies. Exploring these water uses from a variety of approaches will help the user complete a comprehensive picture of a company's key connections to water.

> Characterize Water Uses

Tool users need to collect sufficient information about key water uses to identify associated opportunities and risks (see Modules 2 and 3). Characterization of each water use should include information about the quantity of water used, the quality of water used, the purpose of the water use, the source of water used, and seasonal or other fluctuations in water use. A "water balance" is a helpful means of documenting water uses within a facility or process, as highlighted in the Texas Instruments case study on page 13.

www > Web Tool Resources

- Definitions of "water use"
- Checklist of common areas of water use and reliance
- Key questions to identify water use at specific stages of the value chain
- Guidelines for characterizing water uses
- A downloadable Water Use Profile form to compile and organize important information about each individual water use

Step 2: Identify and Characterize Water Impacts

- In what ways does the organization impact surfacewater and/or groundwater through activities at each stage of the value chain?

It may be useful to think of water impacts in two main arenas. First, water impacts may be associated with *water discharges*. Examples of water discharges include water released from a facility wastewater treatment plant, stormwater run-off from company property, and cooling water returned to a nearby waterway. In many cases,

water uses identified in Step 1 will have associated water discharges if the water is not completely consumed by the use. Second, water impacts can result from business activities that do not directly relate to water use, but involve other materials potentially impacting the quality of water sources. For example, air deposition can affect the quality of surfacewaters. Leaching of materials and chemicals can impact the quality of groundwater aquifers. Spills or leaking tanks can impact surface and groundwater quality.

> Identify Water Impacts

In certain stages of the value chain, such as "process/production," direct water impacts will often be easy to identify because they involve activities that are likely to be regulated by government agencies. At each end of the value chain, however, direct and indirect impacts may be less obvious. Using several different approaches will help to identify hidden water impacts. For water discharges, be sure to consider all the ways that water quality can be changed by an activity. In looking for possible impacts arising from contact with raw materials, production intermediates or finished product, consider all of the materials used in your company's supply chain as potential sources. Then, consider the value chain. Use it as a lens to focus a systematic search for water-related impacts. For example, customers may require water to use, clean, or maintain a company's products or services. Key water impacts should be identified in this step. Tool users should consider *potential* impacts, and not just those that may occur routinely.

> Characterize Water Impacts

Tool users need to collect sufficient information about key water uses to identify associated opportunities and risks (see Modules 2 and 3).

The following elements should be considered in characterizing each water impact: the type of impact, the amount of water affected, the quality of the water discharged or impacted, the location of impact, the magnitude of impact, potential affects on ecosystems, and potential affects on public health, society, and culture.

> Web Tool Resources

- Checklists of common water impacts
- Key questions to identify water impacts at specific stages in the value chain
- Guidelines for characterizing water impacts
- A downloadable Water Impact Profile form to compile and organize important information about each individual water impact

Step 3: Identify and Assess Water Sources

- What are the primary water sources connected to the company's water uses and impacts?
- To what degree is the water source(s) under stress?
- To what degree does the business affect this source through its water use or impacts?

For each water use and impact identified in Steps 1 and 2, it is important to identify the primary source(s) of water relied upon and/or impacted. Companies should explore the vulnerabilities associated with sources that the company directly and indirectly relies upon and/or impacts. Water use, impact, and source information is then brought together in Module 2 to identify and prioritize potential business risks. Tool users should consider information such as the general description of the source, the size of source, the source's rate of replenishment, the source's quality, other industrial,

agricultural, domestic, commercial, and ecosystem demands on the source, as well as climatic conditions or weather patterns, such as drought.

In many cases, it will be sufficient for the tool user to perform a brief assessment of primary water sources on which the facility or company relies or impacts. If there are signs of vulnerability associated with a water source, a more in-depth assessment might be warranted. A case study on page 36 in Module 5 presents an approach that Anheuser-Busch Inc. has found to be helpful in assessing the status of water sources on which its facilities depend.

 > Web Tool Resources

- Guidance on assessing water sources
- Key questions to ask about source status
- A downloadable Water Source Profile form to compile and organize important information about each critical water source

Module 1 Outputs

Identified water uses and impacts at each stage of a company's value chain and source status information from Module 1 will drive the assessment and prioritization of potential business risks in Module 2.



Exploring Water Connections Along the Supply Chain Anheuser-Busch Inc.

In 2001, Anheuser-Busch (A-B), the world's largest brewer of beer, experienced business impacts from unexpected water shortages affecting its supply chain. A temporary drought in the U.S. Pacific Northwest increased the price and reduced the availability of key inputs to Anheuser-Busch's brewery operations—barley and aluminum. An unusually dry winter, coupled with a turbulent West Coast electricity market that is highly dependent on water for power generation, created intense short-term competition for limited freshwater resources. Reduced allocations of water for irrigation in Idaho resulted in reduced acreages of barley, a key brewery ingredient. At the same time, aluminum production, which relies on large amounts of low-priced energy generated from hydroelectric dams in the region, was drastically reduced as electricity prices skyrocketed. This experience in facing water-related challenges along the supply chain has expanded the business case for taking a more comprehensive, strategic, and sustainable approach to water issues.

Looking Down the Value Chain: Recognizing the Importance of Water to Consumers

The Procter and Gamble Company

The Procter and Gamble Company (P&G) markets approximately 250 brands of consumer products to nearly five billion consumers in more than 130 countries. The products include laundry detergents, toothpastes, shampoos, feminine hygiene products, pharmaceuticals, snacks, diapers, cosmetics and cold remedies. As P&G looked at their water use and impacts along the value chain, the company identified a number of areas for improving water management. Over the past few years, it has significantly reduced water usage and pollution at its manufacturing plants. However, one of the company's biggest challenges is to address consumer use of water.

Water is essential for the use and disposal of virtually all of P&G's products. Nearly 85% of sales are associated in some way with household water use. Because water has such a tremendous effect on both consumers' lives and its business, P&G has identified water as one of two priority sustainability focus areas.

Module 1 Case Studies

To focus itself on this subject, P&G has established a water sustainability guideline for its product development efforts. *"As you improve current products, or develop new-to-the-world products and services, think about how you could apply our technologies to use less water, use water differently, or use no water at all."*

P&G is pursuing cleaning and laundry products that use less water, cold water, non-potable water and even salt water. They are developing shampoo and personal cleaning products that use less water or no water at all. To help consumers improve the quality of their water use, P&G is also developing filtration and treatment systems that treat and recycle water in the home.

Using a "Water Balance" to Identify and Characterize Water Uses Texas Instruments Incorporated

Texas Instruments (TI) has found that developing "water balance" diagrams that map water inflows, outflows and intermediate reuse between production and support areas in a manufacturing plant provide valuable information for improving water management and reducing costs. A water balance is very beneficial during the design of manufacturing plants as well as during efforts to optimize subsequent plant operations, particularly where appropriate flow meters are installed. Identifying the amount and quality of water needed in all (or major) water use areas allows the development of a better integrated water use program during process design that may reduce demand for freshwater. A water management system can also match water use requirements with other water streams in the facility of appropriate quality, enabling reuse without additional treatment.

TI's semiconductor fabrication plant in Miho, Japan has been in operation since the early 1980s as a zero industrial wastewater effluent plant. The plant was built this way at the request of the local neighbors and government. At the time, the area lacked the infrastructure to support a more conventional plant design, which typically uses over a million gallons of water per day. The production area at the Miho plant reuses process water over and over again, enabling the plant to consume a much smaller amount of water than comparable semiconductor plants. Some generated production "byproducts" are segregated from process water and collected for reuse as raw materials

at other companies or disposed of as concentrated waste solutions.

The Miho plant has found water balances to be useful tools for improving process designs and communicating about water use. A sample water balance for the Miho plant is available with this case study on the GEMI Water Sustainability Tool website (www.gemi.org/water)



The complexity of a water balance depends on the type of facility and the characteristics of the local area. A site with only a few water use requirements might need only a simple water balance prior to starting a water management program. For a complex site with many water uses, an accurate site water balance should consider seasonal impacts as well as water use at various production rates. For example, at the Miho plant and a similar plant in Hiji, Japan, there are actually many water pipeline interconnections between areas to minimize water use. Many of these connections at the Miho and Hiji plants are measured on varying frequencies to assure gains are being maintained and to identify additional opportunities.

Using an accurate water balance in a sound water management program can improve:

- Identification of current and future water uses
- Consideration of water conservation opportunities during the plant design phase
- Ability to troubleshoot problems during actual plant operation by using flow meters to compare actual water use with plant design
- Identification of water reuse opportunities during plant expansions
- Identification of other future cost-effective water conservation projects
- Ability to communicate water use issues within the company and to external critical customers

Module 2: Business Risk Assessment

Module Purpose

Based on the identified areas of water use and impact, Module 2 helps tool users identify, characterize, and prioritize potential corresponding business risks. Business risk often comes in the form of potential constraints on economic activity. These may result from cost increases, process and production delays, limits on capacity expansion, decline in demand for products and services, and changing customer preferences and expectations. Module 2 helps organizations answer the following questions:

- What are the business risks linked to the organization's water uses and impacts, taking into account the vulnerability of key water sources affected by these uses and impacts?
- Which risks are most significant?

Prioritized risks from Module 2 highlight the focus areas for consideration in Module 3. Module 3 helps tool users to identify creative options to reduce risk, create business value, and contribute to water sustainability.

Module Approach

Understanding the business *sensitivity* to water-related changes, as well as the relative *likelihood* of these changes occurring (which is often linked to the vulnerability of the affected water sources), provides important information regarding potential business risks. Such information enables business

By exploring the business' sensitivity to water-related changes, tool users should be able to make a qualitative assessment of the business 'importance' of each use.

Module 2



managers to assess and articulate the business case for developing a strategy to mitigate potential water-related constraints to business activity.

Most businesses employ well-established procedures for identifying and evaluating potential business risks. Tool users are encouraged to seek opportunities for incorporating the risk information and evaluation criteria into such core business risk evaluation processes, including due diligence assessments for site acquisition, issue identification systems, environmental management system risk assessment processes, and other risk assessment activities. Such processes help ensure that water-related risks are routinely considered as changes in business operations and water trends occur.

Step 1: Water Use Risk Assessment

- How much would an external change in water availability affect the current business use?
- What is the likelihood of change?

> Business Importance of Each Water Use

Consider each water use identified in Module 1 to determine how sensitive the business is to external changes that could affect this water need. A business would be highly sensitive to a change if it, or the company's response options, would result in significant business constraints. External changes can result in steep increases in water costs, production delays, limits on production, or strong community opposition to company activities. For each water use, consider how sensitive the business is to a change in 1) water price, 2) water availability, 3) water quality, or 4) the loss of a specific source. By exploring the business sensitivity to water-related changes, tool users

should be able to make a qualitative assessment of the business "importance" of each use.

> Probability of Change (in water price, quantity or quality)

Next, tool users should consider the water source assessment information prepared in Module 1 to assess the likelihood of the changes considered in the sensitivity analysis actually occurring. Frequently, this will be linked to the vulnerability of the water source(s) relied on for the use. For example, an aquifer that is being rapidly depleted or contaminated would likely be vulnerable to changes or response actions such as public policy changes or price increases that can affect the business. However, changes in water prices and allocations are often not directly related to the vulnerability of local water sources, but may instead stem from broader changes in public opinion and policy related to the needs of other water users.



> Web Tool Resources

- Key questions to assess sensitivity to external changes in water availability
- Key questions to assess probability of change in water price, quantity, or quality



Step 2: Water Impact Risk Assessment

- How much would an external change in water impact requirements affect the current business use?
- What is the likelihood of change?

> Business Significance of Each Water Impact

Consider each water impact identified in Module 1 to determine how sensitive the business is to

external changes related to this water impact. A business would be highly sensitive to a change if the change, or the company's response options, would result in significant business constraints. For example, stricter effluent standards can result in significantly higher treatment costs to remove contaminants. Community concerns about a company's water impacts can affect your "license to operate." Certain spills have potential for high liability and impact on company reputation. In some industries, product use has been linked to water quality problems. For each water impact identified in Module 1, at each stage of the value chain, consider how sensitive the business is to increased costs or short time turnarounds to reduce water impacts. By considering the organization's sensitivity to external changes associated with its water-related impacts, tool users should be able to make a qualitative assessment of the business "significance" of this impact.

> Probability of Need to Change Current Water Impacts

Next, tool users should consider the water source assessment information prepared in Module 1 to assess the likelihood of the changes considered in the sensitivity analysis actually occurring. Frequently, this will be linked to the vulnerability of the water source(s) affected by the water impact. For example, response actions to address more stringent regulatory requirements, opinions of the public and NGOs, or legal liability are more likely to be necessary when the water impacts are contributing to harm or degradation that impinge upon other water demands—including human needs, other industrial or agricultural needs, and ecosystem needs. Users should also assess changes in broader public opinion, policy and regulatory approach.



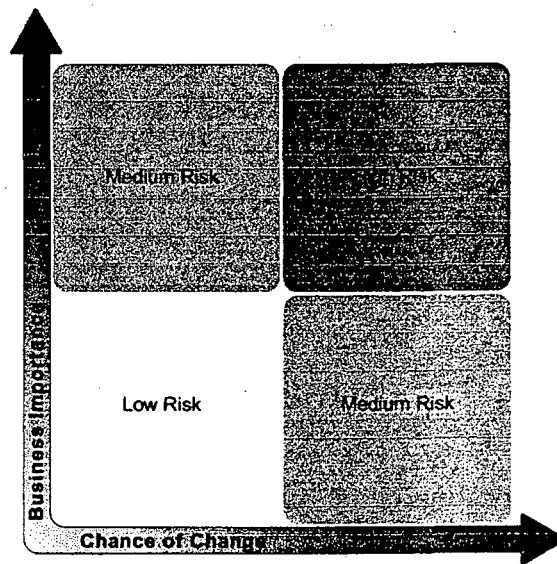
> Web Tool Resources

- Key questions to assess sensitivity to change in current water impacts
- Key questions to assess likelihood of change in water impact requirements

3

Step 3: Prioritize Water-Related Risks

Once tool users have identified the importance or significance of water uses and impacts, and assessed the vulnerability of affected water sources and the likelihood of external changes stemming from those source vulnerabilities, the information can be plotted on a simple risk matrix to help prioritize the resulting business risks.



Water uses and impacts that fall in the high and medium risk quadrants are likely to demand further consideration and assessment. Tool users are

encouraged to adapt the output format from Module 2 to match the risk evaluation and ranking formats used in their organization's core risk identification and management processes.

Module 2 Outputs

Prioritized risks from Module 2 signal key areas of focus for Module 3, as tool users develop options for mitigating water-related business risks.

Using Source Protection Planning to Identify Source Vulnerabilities

The Coca-Cola Company

The Coca-Cola Company oversees the operation of more than a thousand beverage manufacturing plants in nearly 200 countries around the world. Water is an essential ingredient to their products. To assure a continuous supply of high quality freshwater, all facilities are expected to evaluate the reliability of water sources on which they depend.

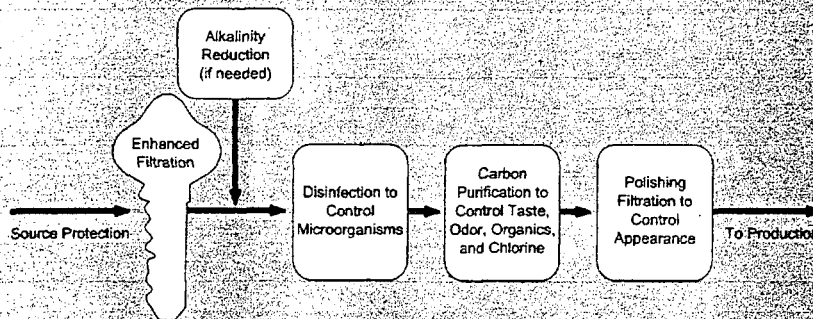
The Coca-Cola Company has recently undertaken source protection planning, a cost-effective program to improve the safety of their water treatment systems, without increasing treatment costs. Source protection plans must include a comprehensive assessment of potential sources of contamination, strategies to protect wellheads and aquifer recharge zones, and active participation in local watershed management efforts. Each of the 25 plants located in areas of water scarcity received increased technical and financial support from the regional offices, sometimes using consulting services to assess in-depth water supply reliability. A self-assessment tool was developed to support long term planning of water use for the bottling operations as well as for their broader hydrographic basins.

To assure high quality water in production, Coca-Cola plants operate a complete multiple-barrier water treatment system using the approach on the following page.

Watershed management initiatives may reduce treatment costs by improving the quality of the water inputs at the source. Reduced microbial load and lower concentration of nutrients, which will generate less algae, limit the need for expensive treatment steps.

For example, since 1995, a Coca-Cola bottling plant in Brazil has invested more than \$2 million in partnership with the municipality and other businesses to protect the Jundiaí River watershed, the primary source of water for that community. As a result, two key sanitation projects (a new solid waste landfill and a new wastewater treatment plant) were built, dramatically improving the quality of the water reaching the reservoir. The plant, which is the largest in the Coca-Cola system, also improved water use efficiency by lowering its usage ratio from 2.9 to 1.7 liters of water per liter of beverage.

Module 2 Case Studies



Coca-Cola's Multiple-Barrier Water Treatment Approach

Educational activities focused on water conservation are also sponsored by the Jundiai plant, including daily school visits to the new fish habitat created at the plant's wastewater treatment plant.

Coca-Cola is finding that source water protection is an effective business continuity strategy that can reduce costs, improve ecosystem health, and benefit the communities where it operates.

Managing Strategic Risk Through Innovative Wastewater Treatment DuPont

DuPont operates a nylon and polyethylene manufacturing plant in Victoria, Texas along the Guadalupe River and Victoria Barge Canal. The plant, which began operation in 1951, historically relied on deep well injection as its sole wastewater discharge method. While this approach continues to be a wastewater disposal option approved by the U.S. EPA, DuPont was concerned about the business disruption that could result from increasing community concerns and potential regulatory changes that would restrict this technique in the future. To eliminate this risk, DuPont worked with experts and the local community to develop an innovative water treatment facility and wetlands water recovery system to replace DuPont's use of deep well injection.

DuPont modified production processes to recover and reuse over 250,000 pounds of material formerly lost to wastewater streams each day. Of this material, 75% is sold to customers or recycled as catalyst and raw material, and the other 25% serves as fuel and offsets natural gas use at the plant. The remaining wastewater

is then treated in an on-site biological treatment facility, before being released to the newly constructed wetlands for further polishing prior to its return to the Guadalupe River.

The wetlands construction concept originated within the local Community Advisory Panel (CAP) in 1994. (CAPs are recommended and some type of formal community interaction process is required for all member facilities as part of the American Chemistry Council's Responsible Care® initiative.) Leading experts and consultants researched and developed the design for the wetland. Broad community input was sought and received through public meetings, addressing factors such as water quality, safety, aesthetic value, wildlife, and academic and community use of the habitat. Plans were also developed for a "Wetlab Education Center" at the wetlands, with nature trails and boardwalks, to conduct scientific and environmental education programs for the community.

Since the wetlands water recovery and treatment facility began operation in 1998, a variety of ecological and community benefits have emerged, including:

- The wetlands now host a variety of flora and fauna including hundreds of bird species
- More than 2.4 million gallons of recovered water are returned to the Guadalupe River each day
- Thousands of students have toured the constructed wetlands and participated in programs at the Wetlab Education Center

By building the wetlands treatment facility, DuPont found not only that the project provided needed functionality at competitive cost and reduced risk, but also that it created benefits for community education and habitat creation.

This page intentionally left blank

Module 3: Business Opportunity Assessment

Module Purpose

Module 3 assists tool users to identify water-related opportunities in two main areas and to answer the following questions:

- What opportunities exist to proactively address costs and potential risks to the business associated with water use and impacts?
- What opportunities exist to create “top line” business value by addressing water challenges faced by others?

The purpose of this module is to develop a range of options for responding to the water-related risks identified in Module 2. The ideas generated in this module will be considered and evaluated as the business develops a strategic direction and a water sustainability strategy in Modules 4 and 5.

Module Approach

Module 3 uses the *water sustainability concepts* (see page 4) as a framework for generating new ideas and opportunities to reduce “bottom line” risks and create “top line” business value. The concepts are drawn from the research of water sustainability experts and the innovative business responses to water challenges, as illustrated in the case studies in this tool. The concepts can be applied to each of the prioritized areas of risk identified in the current state assessment (Modules 1 and 2). For

Water challenges can expand existing market opportunities and even create new ones.

Module 3

For each water challenge identified in Module 2, companies should explore a broad range of sustainable options to reduce risk and increase water security.

Water challenges also present new opportunities to use core competencies to create “top line” business value.

example, to reduce overall use of water, a company may launch a water conservation initiative at its production facilities. Alternatively, to address water quality challenges through prevention, and engage local stakeholders, a company may invest in local watershed conservation initiatives to help ensure a safe, clean, and reliable water supply in the locality in which the company has operations. For each identified risk, there are likely to be numerous opportunities for mitigation of the risk or costs.

Other concepts can be applied to the search for business opportunities that address the global and local water challenges experienced by others. Global water challenges can expand existing market opportunities and even create new ones. This module is designed to assist companies in identifying such opportunities.

Step 1: Identify “Bottom Line” Risk and Cost Reduction Opportunities

- What actions can the business take to reduce the prioritized water-related business risks and costs in a manner consistent with the water sustainability concepts?

During this step, tool users are encouraged to draw from a number of different sources to develop a list of potential response actions for each significant risk identified in the current state assessment (Modules 1 and 2). The water sustainability concepts should be applied to each prioritized risk. For each risk, tool users may also want to categorize response actions into areas that require: 1) using new technologies, 2) adopting new practices, and 3) using incentives to motivate change in water use culture and behavior. The user may also want to organize a team to brainstorm a range of options. Certain actions, such as installation of meters, should be considered as an initial step, if more information is needed. Many opportunities to reduce water related impacts and risks are specific to certain industry sectors, operations, and processes.¹ There are numerous trade publications and industry-specific resources that include information on practices, technologies, and other techniques for addressing water use and impact issues. Case studies throughout this [www](http://www.gemi.org/water) tool and on the website (www.gemi.org/water) provide examples of innovative opportunities to conserve, reuse, and recycle water, as well as to reduce water impacts. GEMI has also developed a guidance document to help businesses understand the ways environmental activities can add business value.²

www > Web Tool Resources

- Checklists of common opportunities associated with each water sustainability concept
- Links to resources on water conservation, reuse, and recycling

Step 2: Identify "Top Line" Value Creating Opportunities

- What water-related products or services can be developed that may lead to increased market opportunities and revenues?
- Are there opportunities to enhance corporate goodwill or safeguard the company's "license to operate" by addressing broader community water needs?

Step 2 is designed to help an organization identify value-creating opportunities for addressing the water-related needs experienced by others.³ Depending upon the organization's core competencies, each organization may be able to identify areas in which it can create business value by addressing local and global water needs. Many companies are already developing new products and services that improve water quality. Others are developing products that use less water by consumers. Companies that follow evolving customer needs and expectations may find new market opportunities. Opportunities to provide indirect benefits can also be found through a more expansive view of a company's critical customers. Tool users should consider water-related actions that address the concerns of communities, regulators, employees, and financial markets. This approach is likely to foster creative thinking about potential business opportunities linked to water sustainability.

www > Web Tool Resources

- Key questions to identify opportunities for creating "top line" benefits

Module 3 Outputs

The options for mitigating risks and creating business value developed in Module 3 will be evaluated in the context of the strategic direction and goals established in Module 4.



Reducing Facility Costs with Water Reuse and Recycling

Abbott Laboratories

Ross Products, a division of Abbott Laboratories and a leading manufacturer of adult and pediatric nutritionals, including infant formula, has reduced costs and risk at several facilities by eliminating "non-value-added water use" and pursuing water reuse and recycling opportunities. At its Michigan plant, the installation of a new cooling tower enabled Ross Products to shut down three groundwater wells, reducing water use by over a million gallons per day. At other facilities, before discharge, boiler blowdown water is circulated through a heat recovery exchanger system to preheat water. Heat recovery projects save each facility over \$30,000 per year. Water from process cooling is used for irrigation and cooling tower make-up water. Recovered water systems save some Ross Products facilities over \$100,000 per year.

Ross Products Arizona and Michigan facilities have taken creative steps to minimize potential wastewater discharge impacts to local surfacewaters from its nutritional operations. Wastewater with high biological oxygen demand (BOD) concentrations is applied to local fields used to produce straw grass for livestock feed. The recycled wastewater serves as a fertilizer while also reducing agricultural watering needs.

Redesigning Facility Water Use: A Watershed Management and Water Reuse Initiative

Bristol-Myers Squibb Company

Faced with a proposed expansion of a research and development campus in Hopewell, New Jersey, Bristol-Myers Squibb Company (BMS) developed a comprehensive Watershed Management Program to demonstrate corporate commitment to sustainable development principles. The Program is an integrative approach to managing water resources on-campus and downstream. The centerpiece of the Program is a water reuse initiative that will replace up to 500 gallons per day of groundwater and surfacewater with treated effluent from the on-site wastewater treatment plant. This treated water will be reused for non-potable uses, including heating, ventilation and air conditioning (HVAC) make-up water, fire protection water, and toilet flushing water.

Currently, water from on-site groundwater extraction wells and diversion of surfacewater from an on-site stormwater detention pond serves these uses.

Using a structured method for gathering information, BMS conducted a rigorous study to assess water uses in the existing facility and proposed future development. They found that internal metering at multiple points is the most helpful assessment tool to determine water use. After evaluating opportunities for wastewater reuse, they developed a conceptual design and began construction in early 2002. Using existing infrastructure in the design controlled capital costs. When the system is operational, the watershed management project will support continued expansion of the Hopewell Campus by addressing community concerns and providing increased ecosystem benefits to the local stream, wetlands, forest and agricultural habitats.

Developing Services to Address Customers' Water Conservation Needs

ConAgra Foods

United Agri Products, a ConAgra Foods company, has pioneered an innovative service through its mPOWER3 subsidiary that helps to improve agricultural productivity while reducing water use and improving water quality. The Greeley, Colorado company developed applications in its suite of software and web-based tools that assist growers to enhance the efficiency and effectiveness of agricultural and irrigation resources. Farmers synchronize mPOWER3's software on their personal computers with the company's web-based systems to share and process data. This software and information management service uses databases, historical algorithms, and geographic information systems (GIS) to process data on weather, soil, hydrology, and other factors that influence crop yields. The resulting information and maps enable growers to release water to plants when they need it, and not according to predetermined schedules. The result: less irrigation water and healthier crops. mPOWER3's systems also generate information that allows growers to better target and time pesticide and fertilizer use and application. The result: less pesticide and fertilizer use, less run-off of pesticides and fertilizer to surface waters, and healthier crops.

mPOWER3 is discovering that the market for these services extends beyond growers. Irrigation authorities, local governments, and other organizations are finding

Module 3 Case Studies

mPOWER3's information management and aerial imagery services to be powerful tools for managing water in a more sustainable manner.

Using Best Management Practices to Improve Water Quality Eastman Kodak Company

Kodak wanted to demonstrate that an innovative regulatory option to reduce silver discharges from photoprocessing facilities could achieve environmental goals more effectively and efficiently than traditional regulatory approaches, delivering cost savings and simplifying municipal pretreatment program administration.

Kodak worked with The Silver Council, the Association of Metropolitan Sewerage Agencies, the U.S. EPA, and others to develop a best management practices approach to maximizing the recovery of silver and minimizing its release to the environment by recommending specific technologies, equipment, and management practices for controlling silver discharges. In 1995, the results of this collaboration produced the Code of Management Practice (CMP) for Silver Dischargers. Pollution prevention recommendations for facilities to minimize wastes and conserve water were also a key part of the CMP.

Both customers and regulatory authorities have experienced the benefits of the CMP. Municipalities can now implement the CMP as a legally authorized and fully enforceable element of their industrial wastewater pretreatment program, or as a voluntary program. Either approach provides a cost-effective alternative to traditional numerical discharge limits for silver and results in consistent and significantly improved silver recovery. The photographic industry's customers now have cost-saving tools for recycling a non-renewable natural resource (silver), conserving water, and ensuring environmental protection.

Building on Core Competencies to Expand Markets

Johnson Controls, Inc.

Johnson Controls is a leading manufacturer of automotive parts and a global leader in integrated facility management services and building controls systems. One of the company's goals is to provide energy efficient

building systems and operations, designed explicitly to help customers conserve energy and protect the environment.

As part of their efforts to provide integrated, energy efficient systems in large commercial buildings, Johnson Controls develops Water Management Programs to reduce facility water use and provide cost savings. For example, a simple program of enhancing plumbing technology and metering water-cooled mechanical equipment at the Johnson City Medical Center in Tennessee reduced water usage by 22% and produced substantial annual cost savings. By adding water management as a new facility service, Johnson Controls has been able to create new markets, build top-line value, and offer a full scope of facility solutions. Johnson Controls has found that the cost savings from proposed water conservation measures often provide the additional funds needed to achieve paybacks from energy efficiency upgrades in a reasonable period.

The company is also expanding markets by promoting the construction of "green buildings" that include efficient water systems. They have participated in the U.S. Green Building Council's program, "Leadership in Environmental Energy and Design (LEED)," a building rating system that evaluates environmental performance from a "whole building" perspective, including impacts on local water resources. Johnson Controls, along with several partners, has developed a new initiative, Buildings for a Livable Future™. The initiative is designed to increase awareness of the positive impact that green buildings have on the natural environment, on providing healthier indoor environments, and on a company's bottom line. The company offers seminars on the topic across the nation.

Johnson Controls has also increased awareness of "green building" by constructing the Bregel Technology Center, the first LEED-certified building in the nation, next door to the company headquarters in Milwaukee, Wisconsin. The Center uses rainwater recovery, metering, and other innovative technology to reduce water use and discharge.

Module 3 Case Studies

Cutting Costs by Recycling Materials from the Water Waste Stream

Olin Corporation

Olin Corporation has been continuously pursuing opportunities to meet one of their sustainability goals: reducing the amount of waste generated by their facilities. They have found that waste reduction activities can also result in increased revenues to the company and improved relationships with critical customers. Olin's Chlor Alkali plant in Niagara Falls, NY, recently received the New York State Governor's Award for Pollution Prevention for an innovative project that eliminated the daily discharge of 16,500 gallons of wastewater to the City of Niagara Falls' sewage treatment facility and that captures former waste materials for reuse in the company's manufacturing processes. The new recycling system, which has been successfully operating since January 2000, eliminated the discharge of a waste stream and cut costs by using recycled materials to help make saleable products, such as liquid bleach and hydrochloric acid.

Finding Solutions to Watershed Issues Through Effective Cooperation with Stakeholders

Southern Company

Southern Company is one of the largest electricity producers in the U.S., with more than 34,000 megawatts of electric generating capacity across the Southeast. The region's population has exploded by 63% since 1970, and is projected to almost double by 2015. This growth has placed significant pressures on the availability and quality of regional water resources. Southern Company subsidiaries rely on water in the production of power in its hydroelectric projects. Coal, gas, oil, and nuclear plants also require large quantities of water for cooling and other purposes. In light of the increasing pressures, Southern Company recognized the importance of working cooperatively in the region to balance and meet competing demands for freshwater resources.

Southern Company is in the process of applying to the Federal Energy Regulatory Commission (FERC) for new operating licenses for its hydroelectric projects on the Chattahoochee River. The river supports a wide diversity of uses, including other industries, recreation, municipal water treatment, and ecosystem functions. Southern Company is faced with the challenge of

reaching agreement among river stakeholders on project operations that will allow the company to continue providing affordable and reliable energy to the growing region, while meeting the shared water needs of the community and the ecosystem. Southern Company has found that paying close attention to the interests of stakeholders and addressing resource agency issues can result in successful outcomes for the company and the community.

Because of the company's attention to building relationships with key stakeholders, Endangered Species Act consultations with federal agencies resulted in a positive outcome. In addition, an agreement was reached with a major property owner to protect river tributaries and local NGOs agreed to a process to monitor water quality outside the relicensing proceedings.

Southern Company has learned that solving water problems cooperatively requires building trust among the parties and following a number of simple guidelines:

- Establish clear ground rules and boundaries early in the process. Be prepared to be flexible, but stick to established guidelines. The regulatory framework often provides guidance, but it requires strong company discipline to contain the scope of the process to the relevant issues.
- Do your internal homework by clarifying company goals, strategy and decision-making authority, and understanding the full range of facility issues.
- Do your external homework by understanding interests and communicating clearly with stakeholders and regulators.

Module 4: Strategic Direction and Goal Setting

Module Purpose

Based on an evaluation of the potential water-related risks and opportunities, the tool user must decide if there is a sufficient business case for engaging the organization in the development of a water sustainability strategy. This preliminary assessment necessitates some consideration of organizational factors, such as the business mission and policies, current goals and priorities, and organizational receptivity to addressing water sustainability issues and risks. Using information on risks and opportunities identified in Modules 2 and 3, Module 4 assists tool users to establish the business case and a general direction for pursuing a water sustainability strategy. Module 4 helps tool users to answer the following questions:

- What business case exists for pursuing a water sustainability strategy?
- What are the company's goals related to water sustainability?
- How can the organization be best engaged in pursuing a water sustainability strategy?

The benefits of addressing water-related challenges, such as reduced risk, enhanced competitiveness, and improved relationships, become more salient in making the business case when they relate to important business priorities or critical customers' expectations.

Module 4

Module Approach

Step 1: Assess the Strength of the Business Case for Pursuing a Water Sustainability Strategy

Assessing the business case typically involves comparing the *cost of action* to address an opportunity or risk with the *benefits derived from taking action*. If the value of pursuing an action is greater than the costs associated with the action (adjusting future costs and benefits with a time discount rate), then there is likely a business case for doing so—a positive net present value (NPV). This NPV approach applies whether one is determining the business case for upgrading a wastewater treatment facility or assessing the business case for establishing a cross-functional committee to develop a company water strategy.

The challenge often lies, however, in determining the cost and benefits of taking action. While the organizational costs of taking action are often relatively straightforward to estimate, the benefits—or avoided costs of inaction—can be more difficult to quantify due to future uncertainty. Estimating the value of less tangible benefits, such as reduced risk and improved relationships with critical customers, can be particularly difficult.¹ Some companies have developed or adapted “total cost assessment” or probabilistic risk assessment tools to support their efforts to determine costs and benefits. Nonetheless, business managers are accustomed to making decisions that involve weighing difficult-to-quantify costs and benefits.

Yet the common toolbox of valuation and decision-making tools, such as NPV, can lead companies to underestimate the value of decisions and

investments that create options for future action. Recent research has highlighted the difficulty of selecting appropriate discount rates for comparing short-term costs and longer-term benefits of environmental investments.² New tools, however, are emerging to assist business managers in making investment decisions amidst significant uncertainty about the future. The concept of “real options” adapts financial options tools to the evaluation of a business’ opportunities.³ Incorporating the value of future “options”—such as secured access to sufficient quantities of clean freshwater at an affordable price—into corporate decision-making can significantly improve the financial attractiveness of strategic investments. Steps that expand, or keep open, future options for a company often create value. For example, a company’s investment in watershed protection could contribute to a valuable future “option” for its facility to expand production capacity in the future by alleviating local water quality pressures.

Even when the benefits of pursuing an action outweigh the costs (e.g., a positive NPV exists), the activity may not compete effectively for limited organizational investment resources and attention. Some water sustainability projects may be too small to easily attract management interest, or they may have a lower return on investment than other projects under consideration. To the extent that investments in water sustainability initiatives can reduce costs, increase competitiveness, safeguard the business’ “license to operate,” and remove potential constraints to future growth, these benefits are likely to resonate with company leadership. The benefits of addressing water-related challenges, such as reduced risk, enhanced competitiveness, and improved relationships, become more salient in making the business case when they relate to

important business priorities or critical customers' expectations.

[www](#) > **Web Tool Resources**

- References and links to information on total cost assessment, options valuation, and making the business case for environmental initiatives
- Key questions to identify organizational priorities and customer expectations

Step 2: Identify the Organization's Water-Related Goals

Most companies have three explicit or implicit core goals related to water: comply with all applicable regulatory requirements; assure continued access to sufficient supplies of clean freshwater at an affordable price to meet the company's needs; and maintain "license to operate" through attentiveness to community needs and concerns.

Some companies see value in pursuing additional water goals to mitigate potential long-term risks, to address the expectations of critical customers, or to support certain sustainability commitments. Tool users should seek to understand the organization's explicit and implicit goals related to water and sustainability. Through their environmental management systems, many companies have developed vision statements, policies, and goals stating their commitment to environmental performance and, sometimes, sustainability. These may include specific goals addressing water security, water use, and water impacts. If not, they may provide insight into implicit water goals. For example, "working with communities in which the company operates to address their environmental concerns" may be a commitment that implies certain goals or focus areas related to water.

Common Business Water Goals

- Comply with applicable regulatory requirements.
- Assure continued access to sufficient supplies of clean freshwater at an affordable price.
- Maintain "license to operate" through attentiveness to community needs and concerns

For businesses that pursue a coordinated water strategy, there may be value in engaging multiple levels of the business—facility, business unit, corporate—as well as critical customers and interested members of the community, in establishing clear water-related goals and targets.

Step 3: Set Strategic Direction to Engage the Organization

Determining *whether* to engage a business in pursuing a water strategy depends on the strength of the business case. The strength of the business case will largely depend on the importance and magnitude of opportunities and risks facing the business (identified in Modules 2 and 3). Determining *how* to best engage a business in pursuing a water strategy depends on three key factors: the organization's culture, the organization's existing strategy and planning infrastructure, and employees' perceptions of water resources, opportunities, and risks.

> Fitting the Strategy Approach to the Organization

Strategies are typically designed to ensure coordinated action to achieve a desired goal. For some companies, particularly those with a weak or

narrowly focused business case, a water strategy may concentrate on specific opportunities or risks. Such a strategy might not engage many functions in the organization and not establish many water-focused activities, such as creation of a water task force. For other companies, the business case may be sufficient to engage the organization in a broad-based effort to pursue a coordinated water strategy. Such an approach would ideally involve multiple business functions to ensure that the water strategy and goals are effectively integrated into existing business processes. The approach that fits best will vary from company to company, and it may change over time. Module 5 provides guidance to ensure that whatever approach is selected contains a continual improvement framework for identifying emerging opportunities and risks that may alter the business case in the future.

> Identifying Whom to Engage

Tool users should identify key people and business functions within the organization to approach regarding the business case for pursuing a water strategy. Most tool users are probably well aware of their business' organizational culture and strategy, planning, and decision-making processes. From this understanding, one can identify who within the organization needs to be aware of the business case for pursuing a water strategy. There may be other personnel or functions within the business that may be affected by a key water opportunity or risk. For example, opportunities to develop partnerships with community-based water organizations may be of significant interest to senior business managers and external affairs staff.

> Building Organizational Interest

In many organizations, business personnel are accustomed to thinking about water resources as a

"limitless frontier," without constraints or significant direct or indirect costs associated with water use. Other businesses may not be accustomed to thinking about potential risks associated with the final disposition of the company's products. In such cases, it may take substantial time and effort to change the organization's perceptions of water from "limitless frontier" to "valued resource and potential business opportunity." Several tips for raising organizational water awareness include:

- Measure water use and post results
- Charge departments or product cost centers for water use and treatment costs instead of including them in facility overhead
- Include water-related costs in project and product investment decisions
- Solicit employee suggestions for water conservation and recognize successes

www > Web Tool Resources

- Key questions to identify whom to engage in the organization
- Additional tips for raising organizational water awareness are included in the matrix tool under Module 5

Module 4 Outputs

Assuming a sufficient business case has been established, Module 4 assists tool users to identify the organization's water-related goals, as well as a strategic approach for engaging the organization in developing a water strategy.



Module 4 Case Studies

Using Performance Goals to Focus Organizational Attention to Water Sustainability

Georgia-Pacific Corporation

Georgia-Pacific (G-P) is one of the world's leading manufacturers and distributors of pulp and paper and building products. Paper mills use a significant amount of water in their operations and their wastewater discharges can impact water quality. Manufacturing packaging materials and thermosetting resins had the potential to save money by recycling or reusing wastewater. In 1994, in order to support G-P management's recognition that strong environmental and safety performance is vital to strong financial performance, the company established clear environmental performance goals in all the environmental media. By setting environmental performance as a top and measurable priority, the CEO led the company on a path toward environmental leadership.

G-P's 1994 Environmental and Safety Report established nearly 60 goals, with associated performance measures, to track environmental progress in each of the categories. The five water pollution prevention goals included:

- Beneficially reuse process wastewater or become closed loop at all G-P chemical plants by 1998.
- Beneficially reuse process wastewater or become closed loop at all G-P packaging plants by 2000.
- Reduce, through waste treatment plant upgrades, total suspended solids (TSS) per ton of product 25% by 1998 and biochemical oxygen demand (BOD) per ton of product 15% from pulp and paper mills by 1998, using 1993 as a base year.
- Measure the impact of color discharges from each major pulp and paper mill to the receiving water body using a delta system, with 1995 as a baseline. Apply Best Management Practices (BMPs) to develop site-by-site cumulative color delta reduction targets to be achieved by 1998.
- Complete underground storage tank upgrades or removals by 1998.

In 2000, after making significant progress toward meeting these goals, G-P developed, with input from employees, new performance measures to track continuous improvement of corporate-wide and individual business unit performance. The measures are designed to help employees, shareholders, communities, and others better understand and evaluate environmental

performance. For example, water use is now measured in terms that are more directly integrated into the business bottom line, such as gallons per ton of product produced. These measurements provide incentives for individual business units to reduce costs associated with water use and discharge. In addition to the measurable improvements to performance since 1994, G-P has found that the principles and goals have helped build a new culture among G-P employees. Using the goals and the performance measures established in 1994, environmental protection and safety awareness have moved beyond being special programs and have become a way of life throughout the company.

Engaging Corporate-Level Support for Plant-Level Water Initiatives

Intel Corporation

Intel operates semiconductor fabrication and assembly/test facilities in seven countries around the world. Water is a primary production input used to clean silicon wafers during fabrication and packaging. Because of the sensitive nature of these processes, ultra pure water must be used. Several of Intel's plants operate in locations where water resources are limited, such as Chandler, AZ; Albuquerque, NM; Hudson, MA; and Israel.

Because the company operates water-intensive manufacturing plants, it has had to share limited resources with competing water needs in the local community, such as municipal drinking water and sanitation, ecosystem protection, agricultural production, and other industrial uses. Historically, Intel has responded to the community challenges at the plant level in different ways, reflecting local concerns and conditions. For example:

- In Albuquerque, NM, Intel used an integrated water management system to increase water purification efficiency and to improve water reuse. The site has offset over 50% of its freshwater needs through water reuse.
- In Chandler, AZ, Intel sends treated process water to an off-site, city-maintained treatment plant that further treats the water to drinking water standards before re-injecting nearly 1.5 million gallons per day to recharge the underground aquifer.
- In Hudson, MA, a state-of-the-art water management facility allowed Intel to boost production by more than 50% without increasing current levels of discharge to the local treatment plant.

Module 4 Case Studies

- In Israel, wastewater is treated to stringent quality standards and then used for irrigating crops.

Although Intel recognizes the importance of meeting local water challenges with responses tailored to local conditions, it also realizes that it needs to support local efforts with broader company resources. As part of a strategic water management program, Intel established the Corporate Industrial Water Management Group to develop and implement program elements to improve water use efficiency at their major manufacturing sites. The group includes representatives from fabrication sites, corporate technology development experts, and regulatory compliance staff. The goals of the group are to:

- Develop water management strategies, standards, and tools to provide effective use and reuse of industrial water to satisfy new and existing manufacturing site requirements for sustainability, growth, and environmental compliance
- Develop tools to effectively communicate water use data throughout the corporation

The Group is helping Intel design appropriate local responses to local issues in the context of a company-wide approach. A number of benefits have emerged from Intel's water management efforts:

- Intel's worldwide water use has increased at a rate less than the production growth
- Principles of water management supporting water reduction, reuse, and recycling are now applied across all Intel sites and support each facility's development of water management strategies
- The Group has developed a set of technology packages that can be applied to meet the diverse water needs of each facility
- Intel has developed an Environmental Awareness team dedicated to raising awareness about water issues within the company and externally
- Intel's efforts have improved relations with local communities in water-stressed areas, such as New Mexico and Arizona

Engaging Employees to Reduce Water Use and Impacts

Novartis Corporation

Gerber Products Company, a producer of baby foods, discovered that employee education and involvement related to water management at its Fremont, Michigan plant can yield significant returns. Gerber is a business unit of Novartis Consumer Health, Inc. In January 2000, the plant's Water Team kicked off a year-long effort to cut water consumption. By year's end, they had saved 67.5 million gallons of water compared to 1999.

The Water Team worked with all areas of the plant to survey water use, collect water conservation suggestions from employees, and identify specific opportunities. Numerous projects emerged from the plant's water conservation initiatives, including:

- Installation of new equipment that uses 30% less water to cool jars of hot baby food
- Recycling of wastewater to wash down the plant's floors, gutters, and drains
- Recycling of wastewater to irrigate corn, oats, and alfalfa grown for animal feed on a 420-acre farm owned by Gerber four miles down the road

Gerber health, safety and environment personnel found that employee education was key to the plant's success, making wise water use a habit. The Water Team produced a video to increase employees' awareness of water issues and plant water use. Among other topics, the video encourages employees to routinely check for leaks and drips to reduce wasted water. Employee involvement with Water Team activities, combined with the video and other awareness raising efforts, has helped to change employees' water management behaviors while enlisting them in company efforts to continually improve the plant's water-related performance.

Module 5: Strategy Development and Implementation

Module Purpose

Module 5 brings together the results of Modules 1 through 4, enabling the organization to develop a water strategy tailored to its needs and circumstances. Effective strategies are typically composed of measurable goals, achievable targets, clear responsibilities, prioritized action plans, and defined continual improvement processes. This module prompts the organization to consider how a range of continual improvement might be implemented across multiple business functions and activities to achieve a company's desired water sustainability goals. This module helps an organization answer the following questions.

- What roles should various business functions play in the development and implementation of a company water strategy?
- What steps and actions can the business take to achieve its desired water-related goals within a continual improvement framework?

The activities addressed in Modules 4 and 5 produce the building blocks of a company's water strategy—goals, roles and responsibilities, and action plans. This information could be organized into a comprehensive business water strategy or incorporated as specific elements into broader business strategy and planning efforts, depending on the company's needs.

Effective strategies are typically composed of measurable goals, achievable targets, clear responsibilities, prioritized action plans, and defined continual improvement processes.

Module 5

Module Approach

Companies are likely to have established environmental and business strategy and planning processes. Integrating, or at least coordinating, water strategy development activities with these broader, established strategy and planning processes can mainstream the organization's water strategy, enhancing both efficiencies and effectiveness.

For example, GEMI's SD Planner™ [www \(www.gemi.org\)](http://www.gemi.org) provides a framework to assist organizations in their development and implementation of a comprehensive approach to sustainable development that encompasses water-related issues.

Step 1: Identify the Roles that Various Business Functions Can Play in Developing and Implementing a Business Water Strategy

The type of opportunities and risks, the strength of the business case, and the focus of the strategic direction determined in Module 4 should illuminate the roles that various business functions can play to support achievement of the business' desired water-related goals. Many of the companies profiled in the case studies have found significant benefit in engaging multiple business functions in developing and implementing the organization's water strategy. Cross-functional involvement broadens ownership for tracking and managing water opportunities and risks. It also promotes incorporation of water awareness into established business processes and activities. The following business functions can often play an important role in developing and implementing a business water strategy: Senior Management, Plant Management and Operations, Public and Government Relations, Marketing,

Product Development, Project Leaders, Facilities, Research and Development, and Engineering.

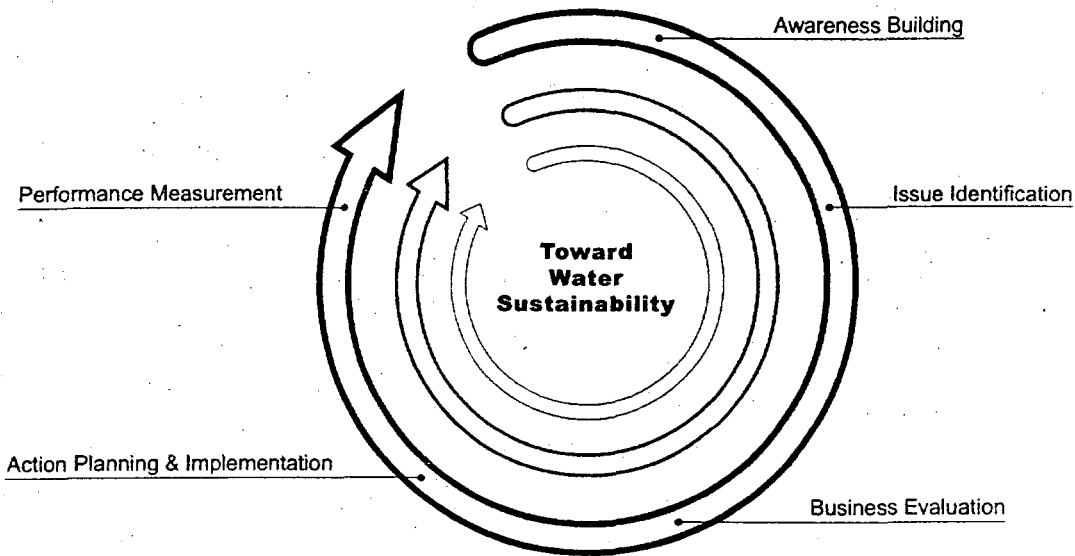
At the same time, securing time and attention from various business functions to address water issues often necessitates that they understand the potential benefits of and business case for their involvement. In some situations, the business case may not be strong enough to warrant their time and attention.

[www](#) > Web Tool Resources

- List of common roles that various business functions can play in the development and implementation of a company water strategy.

Step 2: Identify and Implement Specific Actions to Achieve the Organization's Water-Related Goals

Actions will typically fall into two categories. First, there are actions designed to address specific water-related opportunities and risks. These actions will support key opportunities identified in Module 3. Second, there are actions designed to ensure that the organization effectively identifies, evaluates, addresses, and monitors water opportunities and risks into the future. Such actions focus on awareness building, issue identification, business evaluation, action planning and implementation, and performance measurement. For most companies, these continual improvement actions will fit well into their environmental management systems and into the Plan-Do-Check-Advance process that has been a hallmark of GEMI's tools.



www > Web Tool Resources

- Descriptions of the five continual improvement process areas – awareness building, issue identification, business evaluation, action planning and implementation, and performance measurement
- Matrix tool suggesting actions (supported by links to case studies and resources) that various business functions can take to foster the development of a continual improvement-based water strategy

Module 5 Outputs

Completing Module 5, organizations should have a water strategy tailored to the company's needs and circumstances. The strategy should lay the foundation of a continual improvement system to identify, evaluate, address, and monitor water-related opportunities and risks.

Module 5 Case Studies

Engaging the Organization in Water Strategy Implementation

Anheuser-Busch Inc.

High quality water is an essential ingredient throughout Anheuser-Busch's (A-B) value chain, from irrigation water for grain crops to brewing water for beer. To ensure that sufficient organizational attention focuses on water conservation and other water issues, A-B is engaging multiple parts of the organization in developing and implementing the company's water strategy.

Operations-focused solutions. Facility personnel play a major role in identifying and implementing water conservation initiatives. With corporate assistance, A-B facilities have installed water meters and information systems to provide facility personnel with real-time information on water use throughout facility processes. A-B facilities use this information to develop a "roadmap" of water uses and flow rates, using a "materials balance" approach. Process engineers, utility conservation engineers, and other specialists from the facility and corporate EHS use these roadmaps to identify specific water-saving opportunities. For example, in 2000, a multi-disciplinary Utilities Task Force at A-B's Williamsburg, Virginia brewery identified opportunities to save over 175 million gallons per year. A review of the facility's automated cleaning processes revealed an opportunity to reduce rinse water by 36 million gallons per year. In addition, at an employee's suggestion, bottle and can rinsing equipment in the packaging area was recalibrated, saving 24 million gallons of water annually.

Brewmasters and water reliability. A-B brewmasters play an essential role in assuring the long-term reliability of local water supplies. Brewmasters are responsible for building relationships with local water utilities and suppliers to help ensure that local water sources are managed in a sustainable manner. A-B has developed a "water reliability survey of long-term fundamentals" to assist plant staff in working and planning with local water supply managers to maintain the health and reliability of local and regional water sources.

Corporate support. A-B established a Corporate Water Council to support and coordinate efforts across the company to address water opportunities and risks. The Council meets quarterly to discuss emerging water issues, opportunities, and the company's progress toward addressing water challenges.

Tracking Water Performance: Metering and Metrics

DuPont

DuPont began to explore potential water metrics in the mid-1990s as part of the company's growing focus on sustainability. The effort met initial internal resistance at the facility level due to "metrics fatigue" and concerns that certain metrics definitions related to water "consumption" would unfairly penalize some facilities when compared to others. Over time, EHS staff built awareness at the facility level, used examples illustrating the benefits of metrics, and made a sufficient business case for proceeding. DuPont formed a team of corporate and facility personnel, supplemented by water resource and engineering experts, to determine how to best approach water performance measurement.

The team examined water metrics developed by other companies and found total *water intake* to be the most commonly measured parameter. After significant consideration, the team opted to measure four key aspects of water use:

- Consumption of potable water—a measure of all water withdrawn from municipal potable supplies (considered 100% consumption)
- Consumption of groundwater—a measure of all water withdrawn and displaced from groundwater sources, even if returned to surfacewater (considered 100% consumption)
- Consumption of surfacewater—the "consumed" portion is the difference between the intake and outtake volumes
- Total water intake from surfacewater—a measure of total water withdrawn from surfacewaters, including water returned to surfacewater bodies and water consumed through evaporation, irrigation, or other uses

Facilities routinely enter this water data into DuPont's environmental information systems, enabling roll-up and analysis of the data by location, region, business unit, or other criteria. Under DuPont's Corporate Environmental Plan, facilities are required to develop performance goals and targets associated with these water metrics to foster improvement over time.

Overcoming Challenges on the Path to Water Sustainability

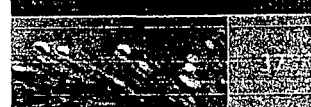
As companies develop strategies to address water issues, they may encounter resistance due to established water management practices, perceptions, and policies at the global, national, regional, and local level. At times, corporate culture, public policy, and/or market forces may be strong enough to discourage pursuit of more sustainable water management practices and strategies. Yet, delaying may result in missed opportunities for market leadership or environmental improvement, as well as difficulty in pursuing more sustainable options later.

This section is intended to help tool users anticipate and identify such obstacles and perceived obstacles. It also offers tips and strategies for overcoming these challenges.

It is not always easy to see the benefits of investing in sustainable water activities, especially in the face of existing public policy disincentives. Taking a leadership role in your company or sector may entail risks, but you may reap important benefits by improving your relationships with critical customers, such as government regulators, shareholders, employees, community groups, or financial institutions.

Taking a leadership role in your company or sector entails risks, but you may reap benefits by improving your relationships with critical customers.

Challenges



Common Misperceptions about Water Management

“The price of water does not always justify conservation activities.”

With low water prices, it can be difficult to make a business case for investing in conservation projects. In some cases, direct and hidden subsidies may be present within or external to the business that mask the true costs of water. These costs can often be “surfaced” to give a more complete picture of water-related expenses at a facility or company. The price of water is not likely to be fixed (or may be fixed only for the short-term) and may rise quickly or unexpectedly in the future.

> Tips

- Conduct a water use audit (possibly in conjunction with a local utility) to understand how much water is being used, for what purposes, at your facility.
- Prioritize potential water saving activities. Look for “low hanging fruit,” where a business case is easy to make.
- Consider indirect costs associated with water use, such as related maintenance of plant and equipment, electricity required for pumping, etc., in cost/benefit calculations.
- Use increasing future water prices in projections. Overall trends point to lower subsidies and/or higher prices in the future.
- Calculate other environmental and social “costs” of water use. Reducing water use may provide other benefits to the company by supporting its “license to operate” in the local community.

“If I do not use all of my water allocation this year, I will lose my water rights.”

Water law in some regions of the U.S., and in many other countries, promotes “use or lose” policies for individual water rights holders. At times, using less water may result in the loss of a valuable property right.

> Tips

- Consider water bank programs that allow saved water to be used for in-stream flow in many areas, while preserving existing water rights.
- Consider leasing saved water.
- Consider selling water rights to government agencies or non-governmental organizations (NGOs) for in-stream flow, or as part of a conservation easement.
- Consider participating in programs that allow trading of ecosystem services or water quality credits.
- Collaborate with other water users to create a water conservation trust that can work with several parties to develop efficiency incentives.

“If I conserve now, my share will be reduced further in times of drought or reallocation.”

During drought or other periods of reduction, water purveyors generally give no consideration for previous conservation efforts. Companies may believe they would be better prepared to respond to these events if they had maintained high levels of water use.

> Tips

- Negotiate upfront agreements with water purveyors for assuring access to adequate quantities during times of shortage in return for conservation measures.
- Evaluate a wide range of options, including alternative source identification, in preparing drought contingency plans.
- Consider activities that reduce vulnerability to supply disruptions.

“If I reduce my water use, local utilities will have to raise water rates to pay for system operations.”

Because utilities generally set rates based on water usage, the high fixed costs of local water systems can create a disincentive for conservation. Conservation may result in higher rates to users to meet fixed costs. For example, after successfully encouraging conservation during a drought in Seattle, Washington in 2001, the local utility announced that it may need to increase water rates to recover lost revenue.

> Tips

- Encourage local water purveyors to search for solutions that will lower fixed costs without decreasing capacity or water quality (i.e., investing in watershed protection or demand reduction programs).
- Recognize that rate increases can result from a variety of factors/influences.
- Recognize that conservation efforts may still result in reduced total costs to the company despite rate increases.

“If I reduce my use or improve water quality, there is no guarantee that the benefits will flow to ecosystem restoration or other public purposes.”

Use of shared public resources is said to result often in “the tragedy of the commons.” The “tragedy” is that sharing resources creates an incentive for individuals to compete for and overuse, rather than conserve, those resources.

> Tips

- Participate in watershed groups that represent all landowners, managers, and users. Reach joint agreements about watershed protection activities.
- Consider leading by example and challenging others to contribute to watershed protection and water conservation efforts.

“The public is not ready to accept the use of recycled water.”

There may still be low public understanding of the potential health effects of water reuse and recycling activities.

> Tips

- Take an incremental approach. Build on the success of other efforts. For example, many golf courses are now using recycled water for landscaping. The public seems to accept this use.
- Include local groups during the development of ideas for water reuse or recycling.
- Provide public outreach and education about use of recycled water.
- Use or develop certification systems to provide product branding benefits.

Water Trends

Awareness of global, regional, and local water trends can ensure that organizations have time to plan and act before crises arise. This section presents several important water trends. www.gemi.org/water See the website (www.gemi.org/water) for more trend information and resources.

- Although most of the world is not running out of freshwater, a number of regions face chronic freshwater shortages
- In the future, water shortages are likely to spread due to increasing demands, unsustainable withdrawal rates, difficulty in finding new supplies, pollution and source water contamination, and changing climatic and precipitation patterns
- Water shortages impact regional security by causing human health problems and population displacement, increasing conflicts between competing users, and damaging ecosystem health
- While regulatory responses are becoming more stringent, watershed-based management approaches are expanding

I. Freshwater Supply, Quality, and Availability Trends

The world is not running out of freshwater resources, but freshwater is not uniformly distributed. A number of regions are experiencing chronic freshwater shortages.

Less than one percent of the world's freshwater is readily accessible and located in the lakes, rivers and streams that cross our continents.¹ Although

Supplies of freshwater are stretched to meet the demands of growing populations, increasing industrial development and agricultural production, and ecosystem and wildlife protection.

Water Trends

freshwater is a finite resource, the world's water cycle is constantly renewing itself. Rain and snow supply enough new water every year to inundate all of Europe under almost seven feet of water.² But freshwater resources are not uniformly distributed, and many regions are suffering from shortages.

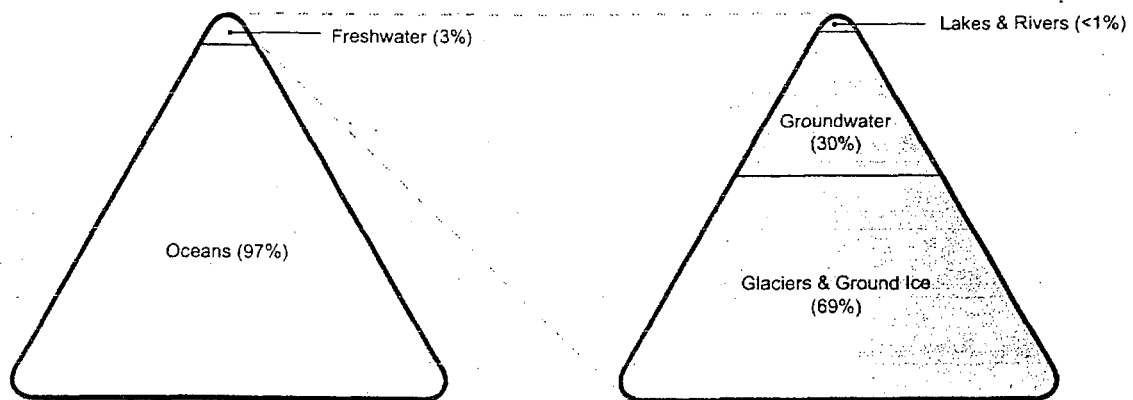
The Middle East, North Africa and the Southwestern U.S., among other regions, have long been familiar with water shortages. Increasingly, shortages are occurring even in places that have access to relatively large amounts of water. China is facing severe surface and groundwater supply problems as it irrigates croplands to feed its enormous population. The Ganges River in India and the Chao Phraya River in Thailand, both of which are in monsoon regions, now experience times in the year when little or no water reaches the ocean.³ The Pacific Northwest of the U.S., well known for its wet weather, and states from Maine to Georgia have recently experienced several summers of drought.⁴

The severity of water shortages varies greatly from place to place. Some areas face issues such as hydroelectric power shortages, decreased crop

yields, and loss of species habitat, while some less developed nations confront the true crisis of insufficient water for basic human needs. Despite this range of differences, an important commonality is emerging in all global water resource issues. Shortages and conflicts are less the result of insufficient technological or infrastructure capacity for accessing new sources and more a result of water demands surpassing the availability of local freshwater resources.

Increasing human demands for water and unsustainable rates of water withdrawal are likely to worsen water shortages. Other factors also have the potential to affect long-term water availability.

40% of the world will live in water-scarce regions by 2025.⁵ Factors likely to contribute to these predicted water shortages include population growth and unsustainable rates of water withdrawal. The United Nations currently estimates global annual



Accessible, Clean Freshwater Is a Small Fraction of Total Global Water Resources

population growth at 1.2%, which translates to an increase of 77 million people per year.⁶

Current data indicates that 10% of the global agricultural harvest—180 million tons of grain—is produced by depleting groundwater supplies.⁷ Extensive surfacewater withdrawals for irrigation have also contributed to the dramatic shrinking of some of the world's great freshwater bodies including the Aral Sea and Lake Chad. Given that agricultural irrigation is the world's largest use of freshwater, accounting for twice as much as the industrial and domestic sectors combined, these unsustainable rates of withdrawal have already caused water shortages and will likely cause more.

Some researchers have identified potential linkages between changes in the earth's climate and water availability. This research suggests that changing precipitation patterns could lead to possible disruptions of traditional weather and run-off patterns and affect regional water supplies. Changing temperatures could also decrease the storage and subsequent slow release of moisture from snow and ice.⁸

Pollution of existing freshwater supplies exacerbates water constraints and shortages. At the same time, water management advances are providing water quality and availability improvements.

Surfacewater and groundwater pollution effectively decreases the quantity of usable freshwater. Many of the world's lakes, large rivers, and most of its estuaries have been contaminated with industrial, municipal, and agricultural runoff and effluent discharges. Contamination of surfacewater has led many regions of the world to turn to groundwater.

While most of the planet's groundwater remains pure (largely a result of the fact that there is almost 100 times as much freshwater underground than there is on the earth's surface), contaminants such as pesticides, nitrogen, petrochemicals, radioactive waste, and a variety of heavy metals increasingly threaten these supplies.⁹ The pollution of groundwater aquifers is not just significant for localized groundwater users but also for surfacewater users since the base flow for major rivers such as the Mississippi, Niger, and Yangtze comes from groundwater sources.¹⁰

Significant progress has been made in developing technologies and best practices for conserving, purifying, recycling, and desalinating water, all actions that effectively increase freshwater availability. In the developed world, basic efficiency measures are now widely practiced in the industrial and commercial sectors and include the use of low-volume plumbing fixtures, reduction of irrigation schedules, and efficiency improvements for water-cooling technologies and equipment. Industrial dischargers generally employ best available pollution control technologies. Basic drinking water and sewage treatment are in place throughout the developed world and some developing nations. More efficient and effective technologies are gradually emerging.

While desalination is not yet cheap enough to be broadly applicable, the technology has advanced significantly, most notably in the technique of reverse osmosis (RO), which uses pressure and semi-permeable membranes to filter salt or other contaminants from water. The effectiveness of RO has increased, as has the durability and dependability of membranes used in the process.

Many areas of the world are taking advantage of improvements in wastewater reuse and reclamation technology. In Singapore, recycled and reclaimed water is emerging as an essential alternative to water from the mainland. By 2010, the island country aims to meet 20% of its water needs through reclaimed water. A new water treatment facility will have the capacity to produce "Newater" (a term coined by the Singapore Utilities Board), reclaimed water with an even higher purity than the standard potable supply.¹¹ In arid Namibia, wastewater-recycling technology has helped meet water needs in the capitol city of Windhoek at less than half the cost of developing new sources of supply.¹²

Expansion of freshwater supplies is increasingly costly and controversial.

In the past, as demand for water has increased, society's focus has been on addressing this demand through increases in supply. However, this solution is becoming increasingly difficult and costly and may soon be infeasible in many areas.

No longer does the drilling of additional wells sufficiently address agricultural supply issues. The area of irrigated land using water from the Ogallala Aquifer in the Western U.S. has decreased since the 1970s because of falling water tables and rising pumping costs.¹³ While advanced desalination technologies have been implemented in some energy rich, water poor areas of the world such as the Middle East, overall costs remain prohibitively high in most places due to the large amounts of energy and capital required.

Large diversion and storage projects are also increasing in cost and decreasing in feasibility,

especially as ecological and social costs are considered. China has long proposed the diversion of its southern rivers, such as the Yangtze, to the country's northern plains to satisfy increasing demand for irrigation water. However, the potential financial, social, and environmental costs of the project have made it very controversial. In 1991, Libya completed a \$25 billion water diversion project that pipes water from desert aquifers to the coastal population centers, but these types of projects are unlikely to solve growing freshwater supply problems.¹⁴

II. Social and Environmental Dimensions of Water Issues

Inadequate supplies of clean freshwater contribute to a broad range of public health issues, especially in the non-industrial nations and some developing nations.

Human health can be affected by freshwater problems ranging from contamination of municipal water supply sources to pollution of water bodies used for fishing or recreation. Pathogens that cause acute illness and disease, or chemicals that can be carcinogens in high concentrations, can affect drinking water supplies. Non-industrial and developing nations face the most serious threats to human health from inadequate freshwater supplies. Various sources estimate that 1 to 1.5 billion people lack access to safe drinking water, 2 to 3 billion people lack access to proper sanitation, and 14,000 to 30,000 people die each day from water-borne illnesses.¹⁵ These astonishing numbers represent a significant challenge for individuals, governments, and businesses in coming decades.

Drought, freshwater depletion, and floods contribute to population displacement.

Freshwater shortages, and attempts to address them through diversion and storage projects, have displaced large numbers of people. As lakes and rivers dry, people dependent on these resources are forced to move. Experts estimate that dams displaced 40 million people in the 20th century. Official records show that at least 10 million were displaced between 1960 and 1990 in China alone.¹⁸ Floods have also contributed to significant population displacement around the globe.

Water scarcity is increasingly leading to conflict, especially in arid areas.

Violent conflict over water resources has occurred in many regions of the world, most notably in the Middle East where scarce water resources exacerbate existing religious and political tensions. Other examples of recent violent disputes over water include a Brazilian invasion of a contested dam site in Paraguay, irrigation rights disputes in India, military protection of dam construction in Slovakia, and violent water shortage protests in Bangladesh. Other examples exist of non-violent water-related conflicts that have produced protests, national and international stand-offs, and contentious debates.¹⁷

Even in places where water scarcity has not escalated to a cause for conflict, there is increasing public concern over water quality and quantity. In the U.S., there is considerable heated political debate over whether to regulate agricultural runoff or to mandate wetlands and endangered species protection. Partly in response, watershed and community action groups in the U.S. and abroad

40% of the world will live in water-scarce regions by 2025.⁵

are becoming more involved in protecting local water resources.

Ecosystem needs for freshwater are broadly affected by human activities.

Due to the finite nature of water resources, there is a constant trade-off between meeting human and environmental freshwater needs. Water taken from a watershed for municipal drinking water supplies, for example, can affect the habitat and health of local species. Indirect impacts of human activities on ecosystem freshwater needs are common. Habitat degradation, urbanization, pollution, and introduction of foreign species can all adversely impact the ability for ecosystems to receive an adequate quantity and quality of freshwater.

As society recognizes the value of ecosystem services and natural capital, environmental needs for freshwater are receiving higher priority.

Often, and especially in times of severe shortage, human needs are given immediate priority over those of the environment. However, there is increasing recognition for the social and economic value provided by the environment and various ecosystem services. Through this recognition of value, environmental needs are receiving more attention. A 1997 report titled "The Value of the World's Ecosystem Services and Natural Capital" placed the annual value of the earth's natural

storage and purification of water at \$2.3 trillion. Annual wetlands services received an even higher value of \$4.7 trillion.¹⁸ Governments, institutions, and businesses worldwide have responded by giving environmental concerns a higher priority when making key water-related decisions.

III. Freshwater Regulatory Trends

Freshwater regulations worldwide are becoming more stringent.

Worldwide, regulations addressing freshwater quality and effluent are becoming more stringent. Largely in response to concerns over the effects of water quality on public and ecosystem health, governments are pursuing a variety of regulatory approaches for reducing water pollution. Techniques include tighter discharge limits for pollutants and nutrients, technology requirements, water use restrictions, and effluent rights trading. Given the increasing pressures on many watersheds and the growing research on public and ecosystem health effects of water quality, it is likely that this trend will persist.

Jurisdictions in many countries are restructuring freshwater subsidies.

Government subsidies for freshwater have often been designed to encourage use of water resources to spur development and agricultural production. However, as shortages have increased, these subsidies have been reexamined. In some areas, subsidies have been restructured to provide incentives for conservation, efficiency, and

watershed protection. The price of water, when reflective of its true cost or value, can encourage responsible use.

In Israel, much discussion has occurred over how best to regulate the use of its water resources, which historically have been heavily subsidized. Because subsidies have prevented prices from rising as supplies dwindle, one of the country's primary aquifers has been drawn down to the critical "red line" level. The country's Infrastructure Minister is now pushing for a complete phase-out of agricultural water subsidies to increase financial incentives for conservation.¹⁹

Regulatory efforts are increasingly focusing on watershed-based management approaches.

Watersheds vary significantly in the amount of water they produce and the types of activities they support both on-site and downstream. Many jurisdictions are turning to watershed-based water management as a way to deliver more effective, locally-tailored solutions. In the U.S., regulatory agencies are exploring watershed-based approaches to water quality protection. For example, Total Maximum Daily Load (TMDL) approaches establish discharge limits for local sources based on watershed health and assimilative capacity for pollutants. The European Union (EU) officially adopted the EU Water Framework Directive (WFD) in September 2000, which aims to improve water quality in all EU water bodies through coordinated watershed management.²⁰

Moving Forward

As GEMI member companies reflected on the emerging challenges facing our businesses and our communities, freshwater availability and quality surfaced prominently on the list. Clean freshwater is vital to business—and to people and ecosystems.

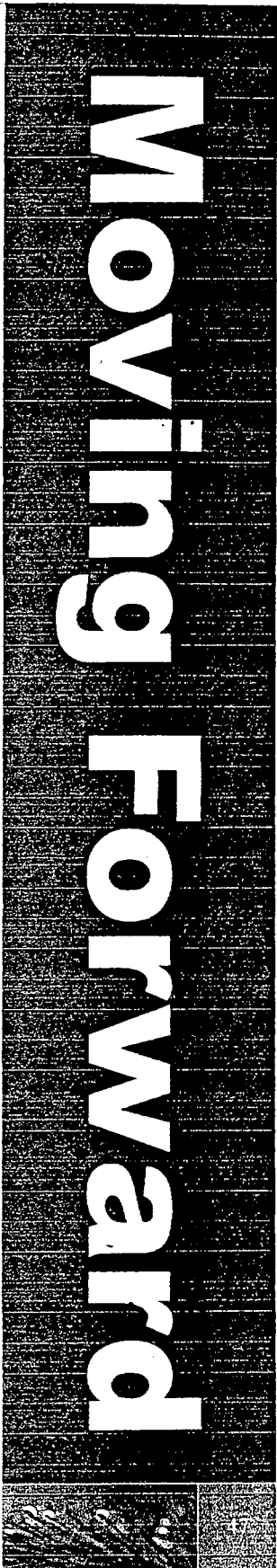
In areas around the world an imbalance is growing between supply and demand for clean freshwater. Supplies of freshwater are being stretched to meet the needs of growing populations, increasing industrial development and agricultural production, and ecosystems and wildlife protection. While the world is not running out of water, supplies of clean freshwater are not always in sufficient availability where and when needs arise. The challenge of meeting these needs intensifies where water sources are depleted at rates faster than replenishment and where waters are being polluted.

The collective experience of GEMI member companies indicates that the business case for strategically and sustainably addressing water challenges continues to strengthen across many business sectors and regions. We see our collective challenge as this: To manage our shared water resources, through thoughtful and collaborative efforts, to ensure the health and well being of people, ecosystems, and businesses now and into the future. To do so will require foresight and creativity.

As we move forward into the 21st century, our understanding about what it means to sustainably

“I have come to believe...that water quality and quantity issues will pose the greatest environmental challenge of the 21st century.”

*Governor Christine Todd Whitman,
Administrator, U.S. Environmental
Protection Agency*



Moving Forward

■ *Continued dialogue and collaboration will be necessary to map broad notions of water sustainability into clear concepts that can guide action and decision-making.*

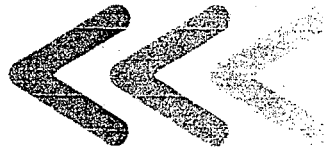
manage freshwater supplies will undoubtedly evolve. Continued dialogue and collaboration will be necessary to map broad notions of water sustainability into clear concepts that can guide action and decision-making. The GEMI Water Sustainability Tool can help companies take an important step forward. Each step that we take forward together will help build a healthy environment, healthy communities, and healthy companies.



Perspectives on Water Sustainability

"Sustainable Development is a very simple idea. It is about ensuring a better quality of life for everyone, now and for generations to come."

U.K. Department of the Environment, Transport, and the Regions¹



"Water is a key to sustainable development, crucial to its social, economic and environmental dimensions. Water is life, essential for human health. Water is an economic and a social good, and should be allocated first to satisfy basic human needs. Many people regard access to drinking water and sanitation to be a human right. There is no substitute for water: without it, humans and other living organisms die, farmers cannot grow food, businesses cannot operate. Providing water security is a key dimension of poverty reduction."

International Conference on Freshwater, Bonn, 2001²

"Water scarcity may be the most under appreciated global environmental challenge of our time."

World Watch Institute³

"Water is needed in all aspects of life. The general objective is to make certain that adequate supplies of water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of

Perspectives



ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases.”

United Nations: Agenda 21⁴

“All human beings have an inherent right to water in quantities and of a quality necessary to meet their basic needs. This right should be protected by law. The right to water is satisfied when every person has physical and economic access to a basic water requirement at all times.”

“Satisfying the standards of [the UN Declaration of Human Rights] cannot be done without water of a sufficient quantity and quality to maintain human health and well-being. Meeting a standard of living adequate for the health and well being of individuals requires the availability of a minimum amount of clean water.”

Peter Gleick, President, Pacific Institute for Studies in Development, Environment, and Security⁵

“One cannot preserve the life of a place and not protect the waters that run through it. Historically, The Nature Conservancy has targeted terrestrial species through protection of the habitats that they need to survive. We have had great success on this front, owning and managing the world’s largest system of private nature preserves. But our thinking and methods have evolved over time and we recognize the connection between land and water is elemental: one cannot preserve both the terrestrial and aquatic life of a place without protecting the waters that run through it.”

The Nature Conservancy Freshwater Initiative⁶

“Forests are vital to this country’s water supply. The largest volume and the cleanest water in the United States flows off our forested landscapes. Forests cover one-third of the continental United States but supply two-thirds of the runoff.... Water is perhaps the most under-valued and under-appreciated forest product. Watershed health and restoration should be the over-riding priority for forest management. We can leave no greater gift to our children than to leave the watersheds entrusted to our care healthier, more diverse, and more productive.”

Mike Dombeck, Former U.S. Forest Service Chief⁷

“Doing more with less is the first and easiest step along the path toward water security. By using water more efficiently, we in effect create a new source of supply.”

“In short, we need a water ethic – a guide to right conduct in the face of complex decisions about natural systems we do not and cannot fully understand. The essence of such an ethic is to make the protection of water ecosystems a central goal in all we do.... Living by such an ethic would mean using less whenever we can, and sharing what we have.”

Sandra Postel, Director of the Global Water Policy Project⁸

Endnotes

The Business Case for Pursuing Water Sustainability: New Opportunities, New Risks

- ¹ GEMI conducted a benchmarking survey of 27 member companies in 2001 to better understand businesses' relationship to water use, costs, risks, and trends. Wastewater discharge limits and water supply availability were identified as two primary emerging issue areas facing the companies. Please visit GEMI's website, www.gemi.org, for a summary of the benchmarking results.

Module 3: Business Opportunity Assessment

- ¹ Vickers, A. 2001. *Handbook of Water Use and Conservation*. Amherst, MA: WaterPlow Press.
² GEMI. 1998. *Environment: Value to Business*. Washington, D.C.
³ GEMI. 2001. *Environment: Value to the Top Line*. Washington, D.C.

Module 4: Strategic Direction and Goal Setting

- ¹ Refer to GEMI's *Environment: Value to Business* (1998) and *Environment: Value to the Top Line* (2001) reports for guidance and case studies to assist companies in determining the value of environmental initiatives.
² Newell, R. and Pizer, W. December 2001. *Discounting the Benefits of Climate Change Mitigation: How Much Do Uncertain Rates Increase Valuations?* Arlington, VA: Pew Center on Global Climate Change.
³ Amram, M. and Kulatilaka, N. 1999. *Real Options: Managing Strategic Investment in an Uncertain World*. Boston: Harvard Business School Press.

Water Trends

- ¹ Postel, S.L. 1992. *Last Oasis: Facing Water Scarcity*. Worldwatch Books. New York: W.W. Norton.
² World Business Council for Sustainable Development and United Nations Environment Program (WBCSD and UNEP). 1998. *Industry, Fresh Water and Sustainable Development*. Available at: <http://www.wbcsd.org>.
³ Houlder, V. "Low water: If rivers and lakes are drained further, many parts of the world may experience increased political tension, food shortages and environmental damage." *The Financial Times*. August 14, 2001. Page 14.
⁴ "Extended Drought Strains Resources Along East Coast." *The New York Times*. April 21, 2002.
⁵ World Resources Institute, United Nations Environment Programme, and the World Business Council for Sustainable Development. 2002. *Tomorrow's Markets, Global Trends and Their Implications for Business*. Paris, France.
⁶ United Nations Population Information Network. 2000. *World Population Prospects, The 2000 Revisions, Highlights*. Available at: <http://www.un.org/popin/data.html>.
⁷ Postel, S.L. 1999. *Pillar of Sand: Can the Irrigation Miracle Last?* Worldwatch Books. New York: W.W. Norton.
⁸ Pacific Institute for Studies in Development, Environment, and Security. 2000. *Water: The Potential Consequences of Climate Variability and Change*. A Report of the National Water Assessment Group.
⁹ Gleick, P.H. 2000. *The World's Water 2000-2001: The Biennial Report on Freshwater Resources*. Washington, D.C.: Island Press.
¹⁰ Sampat, P. "Groundwater Shock: The Polluting of the World's Major Freshwater Stores." *World Watch*. January/February 2000.
¹¹ Kaur, S. "Water supplier has burning ambition." *The Straights Times*. September 19, 2001. Page H6.
¹² Gleick 2000.
¹³ Postel 1999.
¹⁴ Postel 1999.
¹⁵ WBCSD and UNEP 1998; Gleick 2000; World Resources Institute, Earth Trends. Available at: <http://earthtrends.wri.org/>.
¹⁶ Gleick, P.H. 1998. *The World's Water 1998-1999: The Biennial Report on Freshwater Resources*. Washington, D.C.: Island Press.
¹⁷ Gleick 2000.

< Endnotes

- ¹⁸ Constanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R. V., and Paruelo, J. "The Value of the World's Ecosystem Services and Natural Capital." *Nature* 387:253-260, May 15, 1997.
- ¹⁹ "The Price of Water." *The Jerusalem Post*. November 23, 1999. Page 8.
- ²⁰ "Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy." *Official Journal of the European Communities*. December 22, 2000.

Moving Forward

- ¹ "Remarks of Governor Christine Todd Whitman, Administrator of the U.S. Environmental Protection Agency, to the Association of Metropolitan Water Agencies." Washington, D.C. March 19, 2002.

Perspectives

- ¹ *Opportunities for Change*. U.K Department of the Environment, Transport and the Regions. 1998.
- ² "Recommendations for Action." *Water - A Key to Sustainable Development*. International Conference on Freshwater, Bonn, 3-7 December, 2001. Also available at http://www.water-2001.de/outcome/BonnRecommendations/Bonn_Recommendations.pdf.
- ³ Worldwatch Institute Home Page. <http://www.worldwatch.org>.
- ⁴ *Agenda 21, the Rio Declaration on Environment and Development*. Adopted by more than 178 Governments at the United Nations Conference on Environment and Development (UNCED). Rio de Janeiro, Brazil. 3-14 June, 1992. Chapter 18.2. Also available at <http://www.un.org/esa/sustdev/agenda21.htm>.
- ⁵ Gleick, P.H. 2000. *The World's Water 2000-2001: The Biennial Report on Freshwater Resources*. Washington, D.C.: Island Press.
- ⁶ The Nature Conservancy's Freshwater Initiative. *Recommended Strategies for Advancing Freshwater Conservation*. Available at: <http://nature.org/wherewework/northamerica/states/pennsylvania/science/art832.html>.
- ⁷ Dombeck, Michael. "Protecting the Stuff of Life." *Wisconsin Academy Review*. Winter 2002. Pages 14-18.
- ⁸ Postel, S.L. 1992. *Last Oasis: Facing Water Scarcity*. Worldwatch Books. New York: W.W. Norton.

Global Environmental Management Initiative

One Thomas Circle, NW, Tenth Floor
Washington, DC 20005
U.S.A.

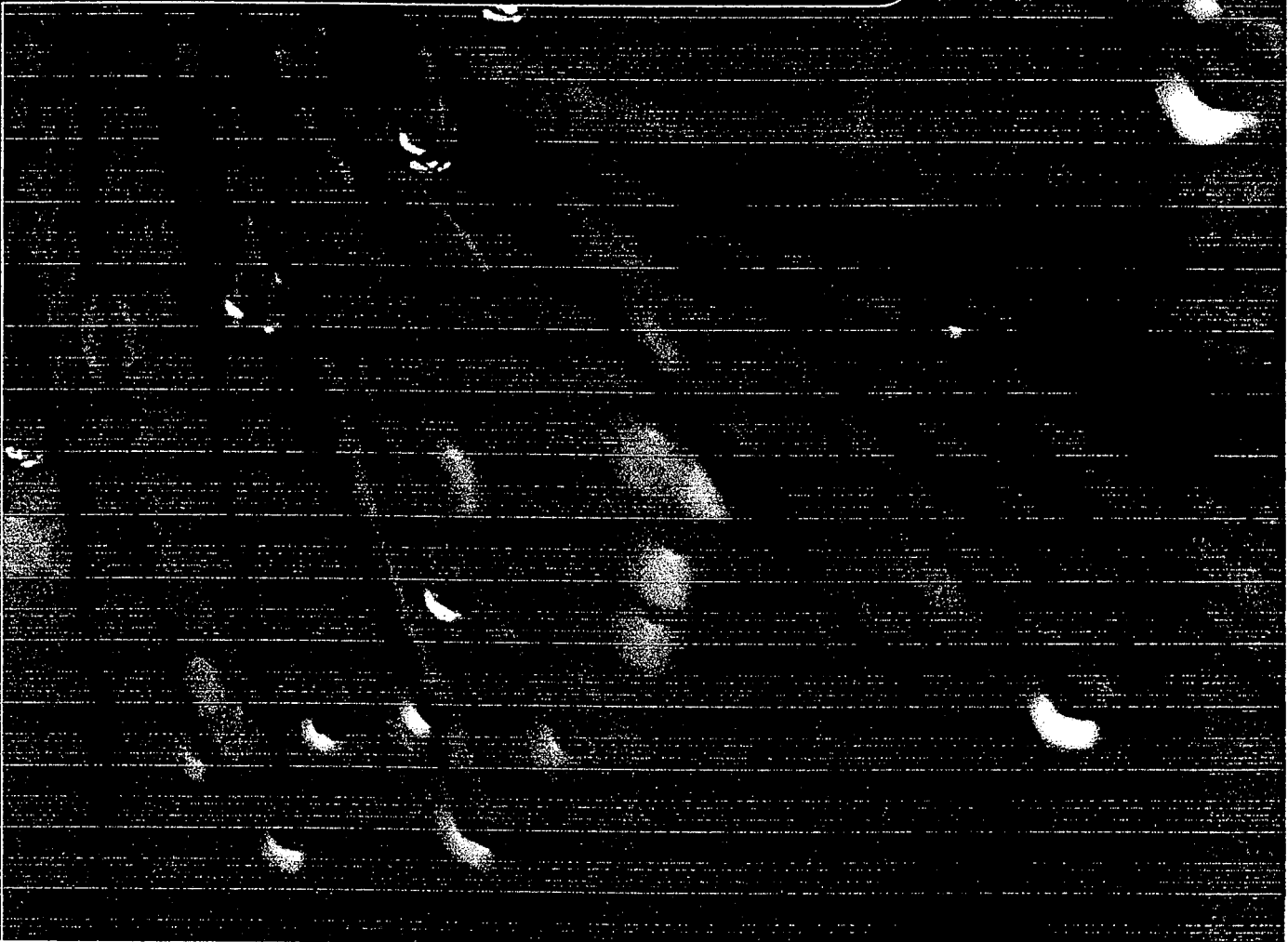


GEMI

202-296-7449 phone
202-296-7442 fax
info@gemi.org
www.gemi.org

Business Helping Business Achieve Global Environmental, Health, and Safety Excellence

Printed on 50% recycled paper with vegetable-based ink.



**DIVISION OF CORPORATION FINANCE
INFORMAL PROCEDURES REGARDING SHAREHOLDER PROPOSALS**

The Division of Corporation Finance believes that its responsibility with respect to matters arising under Rule 14a-8 [17 CFR 240.14a-8], as with other matters under the proxy rules, is to aid those who must comply with the rule by offering informal advice and suggestions and to determine, initially, whether or not it may be appropriate in a particular matter to recommend enforcement action to the Commission. In connection with a shareholder proposal under Rule 14a-8, the Division's staff considers the information furnished to it by the Company in support of its intention to exclude the proposals from the Company's proxy materials, as well as any information furnished by the proponent or the proponent's representative.

Although Rule 14a-8(k) does not require any communications from shareholders to the Commission's staff, the staff will always consider information concerning alleged violations of the statutes administered by the Commission, including argument as to whether or not activities proposed to be taken would be violative of the statute or rule involved. The receipt by the staff of such information, however, should not be construed as changing the staff's informal procedures and proxy review into a formal or adversary procedure.

It is important to note that the staff's and Commission's no-action responses to Rule 14a-8(j) submissions reflect only informal views. The determinations reached in these no-action letters do not and cannot adjudicate the merits of a company's position with respect to the proposal. Only a court such as a U.S. District Court can decide whether a company is obligated to include shareholder proposals in its proxy materials. Accordingly a discretionary determination not to recommend or take Commission enforcement action, does not preclude a proponent, or any shareholder of a company, from pursuing any rights he or she may have against the company in court, should the management omit the proposal from the company's proxy material.

February 28, 2003

**Response of the Office of Chief Counsel
Division of Corporation Finance**

Re: PepsiCo, Inc.
Incoming letter dated December 26, 2002

The proposal provides that the board of directors prepare a report to shareholders evaluating the business risks linked to water-uses and impacts throughout PepsiCo's supply chain, including subsidiaries and bottling partners, with special reference to PepsiCo's current policies and procedures for mitigating the impact of operations on local communities in areas of water scarcity.

We are unable to concur in your view that PepsiCo may exclude the proposal under rule 14a-8(i)(10). Accordingly, we do not believe that PepsiCo may omit the proposal from its proxy materials in reliance on rule 14a-8(i)(10).

Sincerely,

A handwritten signature in cursive script, appearing to read "Gail A. Pierce", with a long horizontal flourish extending to the right.

Gail A. Pierce
Attorney-Advisor