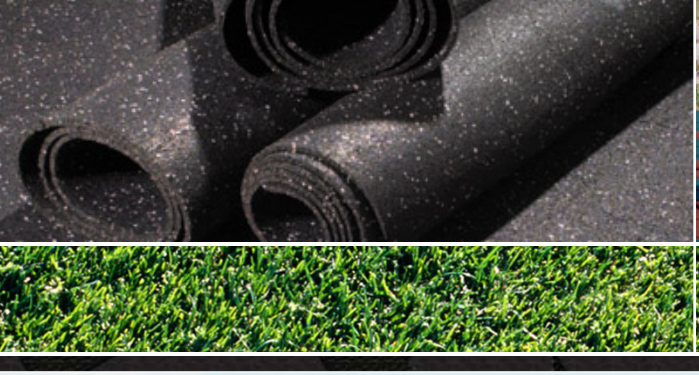
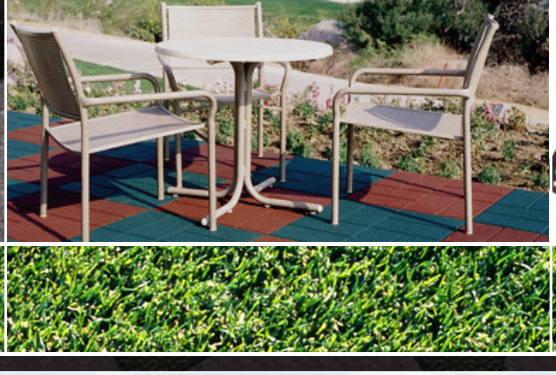



P R O P O S A L

California Integrated Waste Management Board

Tire-Derived Product Business Assistance Program

Contract #IWM05030

ORIGINAL

JANUARY 2006

R·W·BECK

January 18, 2006

California Integrated Waste Management Board
1001 I Street, Contracts Unit, MS-07
Sacramento, California 95814

Subject: **Proposal for Tire-Derived Product Business Assistance Program**
Contract No. IW05030

Dear Selection Committee Members:

On behalf of R. W. Beck and our partners, we are pleased to submit the enclosed proposal to assist the Board in implementing the Tire-Derived Product Business Assistance Program (Program). We have closely tracked and participated in development of this new program since we first discussed it with Board staff in spring 2005. We share the Board's enthusiasm for the Program's emphasis on building long-term, business resiliency while expanding markets for California scrap tires. The key to the Program's success lies in close collaboration among the contractor team, Board staff, and participating businesses. The R. W. Beck team's approach cultivates this collaboration through regular communication and coordination involving all tasks.

Drawing on our team's collective understanding of key implementation challenges and opportunities, we have designed our approach to achieve the following outcomes:

1) Substantial benefits to individual businesses and market sectors, documented in regularly-updated *California Scrap Tire Industry Benchmark Reports* tracking:

- Average business performance measures like process efficiency, profitability and sales;
- Recycling market development measures like increased demand, production capacity, throughput of California-generated waste tires and enhanced waste tire value; and
- Economic development measures like increased employment, wages, and job retention.

2) Maximizing the quality and quantity of assistance provided to businesses by:

- Offering at least $250,000 in additional assistance services to eligible firms by leveraging funding from existing contracts with the California Employment Panel, held by our lead assistance providers the Corporation for Manufacturing Excellence and California Manufacturing Technology Consultants (both affiliates of NIST's *Manufacturing Extension Partnership*); and
- Relying on a core team of senior level assistance leaders backed up by respected experts such as:
  - R.W. Beck's market development team, including senior consultants with deep experience analyzing, developing and implementing state market development programs;
  - Underwriters Laboratory, the nation's foremost product testing and certification organization;
  - Alan Moreland, Ph.D., a ground rubber production and markets expert with over 35 years experience in the rubber and rubber recycling industry;
  - The Recycled Tire Engineering and Research Foundation, including some of the nation's foremost experts on recycled rubber pavement products;
  - Riester-Robb, the marketing and branding experts responsible for California's largest and longest-running statewide recycling public education campaign;

2710 Gateway Oaks Drive, Suite 310 South, Sacramento, CA 95833-4304, Phone (916) 929-3653, Fax (916) 929-1710

- Bottom Line Consulting, engineering management consultants who have successfully demonstrated the benefits of recycled rubber as manufacturing raw material; and
- AMPros, author of perhaps the nation's most in-depth analysis of recycling business performance assessments and a comprehensive benchmarking study.

3) Strong support and participation by California tire-derived product businesses and other stakeholders, secured by:

- Formation of a Cooperative Marketing Advisory Council to assist industry wide expansion efforts;
- Promoting Program benefits and successes using real-life examples, and providing regular program updates at the Board's monthly interested parties meetings; and
- Soliciting feedback and proposing program adjustments to continually improve performance.

Ultimately, the Program will be judged on its overall impact on California waste tire recycling efforts. The tasks outlined in our proposal, in synergy with the Board's many existing efforts, target boosting demand for California tire-derived products by as much as 4.2 million PTE, which would increase the statewide waste tire diversion rate by over 10 percentage points.

As the prime contractor, R. W. Beck will leverage our program management and market development capabilities to focus and provide context for all Program tasks, strategically deploying sub-consultants and staff to ensure the right expertise is provided when and where it is most needed. R. W. Beck's nationwide recycling market development experience, combined with our proximity and familiarity with the Board's staff and operations, ensures we will be responsive to the Board's unique context. Team members are located throughout the state to facilitate client access, and program manager Ed Boisson works in San Rafael, less than 90 minutes from the Board's office, allowing for regular in-person meetings and a close working relationship with the Board's contract manager.

We look forward to helping the Board establish the Program as a new model for recycling market development services in California and throughout the U.S. R. W. Beck is firmly committed to the Program's short- and long-term success, and we intend to demonstrate our commitment by further enhancing our recycling business assistance capacities in California as the Program evolves. Our approach and specific strategies for program implementation are detailed in Sections 1, 2, and 3 of this proposal. Please contact me, Ed Boisson at (415) 499-0919, or email me at eboisson@rwbeck.com, if you have any questions regarding our submittal.

Sincerely,

R. W. BECK, INC.

[redacted]

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California Integrated Waste Management Board
Tire-Derived Product Business Assistance Program
Contract #IWM05030

SECTION 1
Summary

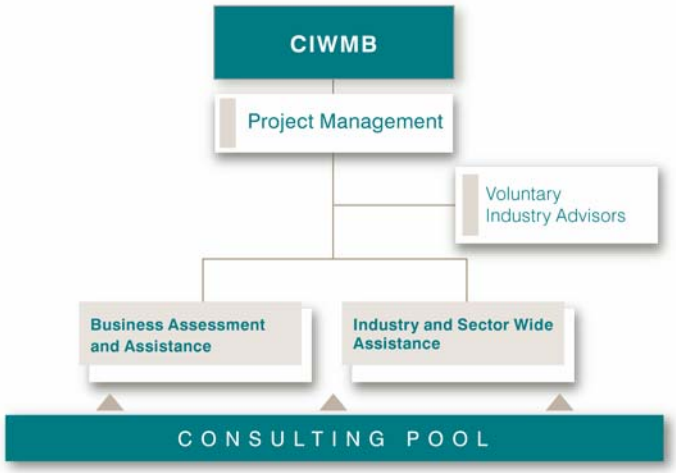
JANUARY 2006

R·W·BECK

Overview

R. W. Beck has closely tracked and participated in the development of the Tire-Derived Product Business Assistance Program since spring 2005. Through many discussions with Board staff and California tire-derived product producers, and participation in monthly Interested Parties meetings, R. W. Beck understands the intent, needs, and challenges related to the Program. We share the Board's enthusiasm for this exciting new program, and recognize its potential to establish a new model for recycling market development efforts in California and throughout the U.S.

We have structured our team to provide both depth (range of expertise) and breadth (sufficient resources to cover work load spikes.)



In close coordination with Board staff, R. W. Beck's management team will coordinate two teams of task leads to implement the program, one responsible for business assessments and assistance services, and one responsible for industry/sector wide strategy development and assistance. A broad pool of consultants will provide depth of expertise in all Program assistance areas, including:

- General and technical business assistance services;
- Marketing and branding campaigns;
- Commercial Web site development;
- Product testing and certification;
- Scrap tire processing equipment;
- Tire-derived product production and markets; and
- Recycling market development and strategic planning.

The following table lists R.W. Beck team members and roles.

Firm	Role
R. W. Beck, Inc.	Program Management and Administration, Scrap Tire Market Analysis, Strategic Planning; Co-Lead, Business Assessment and Assistance; Co-Lead, Industry and Sector Wide Assistance
Corporation for Manufacturing Excellence (Manex)	Co-Lead, Business Assessment and Assistance (Northern CA Focus)
California Manufacturing Technology Consulting (CMTC)	Business Assessments and Assistance (Southern CA Focus)
AMPros Corporation	Co-Lead, Business Assessment and Assistance; Lead, Benchmark Reports
Riester-Robb Pacific, Inc.	Market Planning, Web Site Development, Branding Campaign Design, Collateral Development, Production and Deployment; Co-Lead Industry and Sector Wide Assistance
Sierra Lake Group	Market Planning, Government Sales Specialist, General Business Assistance Support
The Carderock Group	Assessment and General Business Assistance Support
Underwriters Laboratory	Product Testing and Certification
Alan Moreland, PhD	Industry Specialist (Ground Rubber Production and Markets)
Recycled Tire Research & Engineering Foundation	Industry Specialists (Rubberized Asphalt Concrete, Other Road and Engineering Applications)
Bottom Line Consulting	Industry Specialist (Rubber-Plastic Blends and Ground Rubber Manufacturing Applications)
The Carderock Group	Assessment and General Business Assistance Support
Innovative Distribution & Manufacturing, LLC	Industry Specialist (Scrap Tire Processing Equipment and Systems)
TL & Associates	Industry/Sector Wide Assistance (CA Scrap Tire Industry and Board Programs)

Key Issues and Strategies

R. W. Beck has worked with our partners to craft an approach grounded on specific strategies addressing the issues most critical to Program success. These include:

Issue: The Program must result in significant, documented benefits to California's tire-derived product manufacturing markets.

Strategy: Prepare and regularly update a California Scrap Tire Industry Benchmark Report to increase awareness of the program's benefits.

Strategy: Emphasize two fundamental recycling market development principles—demand-driven growth and overcoming specific production barriers— to maximize Program impacts.

Issue: Tire recycling firms and other stakeholders must actively support and participate in the Program.

Strategy: Regularly solicit feedback and make continual improvements to ensure client satisfaction.

Strategy: Clearly document and promote business benefits to boost their interest in the Program.

Strategy: Adopt aggressive policies safeguarding confidentiality and competitive position to alleviate business concerns.

Issue: The Program must complement and build upon the Board's substantial past efforts and strategies.

Strategy: The R. W. Beck team will leverage its familiarity with prior Board efforts, California waste tire markets and our commitment to involving scrap tire industry and other stakeholders to develop new and expanded Board opportunities.

Issue: The Program must be implemented as cost efficiently as possible to maximize the amount of business assistance provided.

Strategy: The R. W. Beck team will leverage the Board's resources by providing eligible firms with direct access to at least $250,000 in additional, training services through the California Employment Training Panel, plus energy auditing services through California utility-sponsored programs.

Strategy: Experienced program managers will broker services to place team expertise where it is needed most, while minimizing overall administrative burdens.

Strategy: The R. W. Beck team will leverage business client resources where possible, and has reduced typical hourly billing rates to maximize the impact of Board funding to Program recipients.

Issue: Due to uncertain work loads, the Program requires a contractor team with great breadth, depth, and flexibility.

Strategy: The R. W. Beck team is structured to offer breadth and depth, while building cohesion among a small core team of managers and task leads.

Strategy: The R. W. Beck team anticipates the need for flexibility and adaptation to continually improve performance.

Strategy: We will maintain close, sustained communication with the Board's contract manager and client firms to keep all stakeholders in alignment with Program goals and objectives.

Approach to Program Tasks

Task 1 Prepare a Work Plan

Objective: Working with the Board's Contract Manager, clearly document the schedule, roles and responsibilities, data needs and confidentiality policies for all aspects of program implementation.

Key Strategies:

- An immediate kick-off meeting and facilitated work plan brainstorming retreat keep the program on-track during an initial work load spike.
- Periodic work plan adjustments allow for continual performance improvements based on feedback from client firms.

Task 2 Conduct a Forum Promoting the Program

Objective: Secure strong support and participation in the Program by California tire-derived product businesses.

Key Strategies

- A forum emphasizing examples of real-life benefits and team services boosts businesses' awareness and interest.
- Regularly updated Program collateral is available on the Internet and is widely distributed, allowing the Board to capitalize on Program successes.

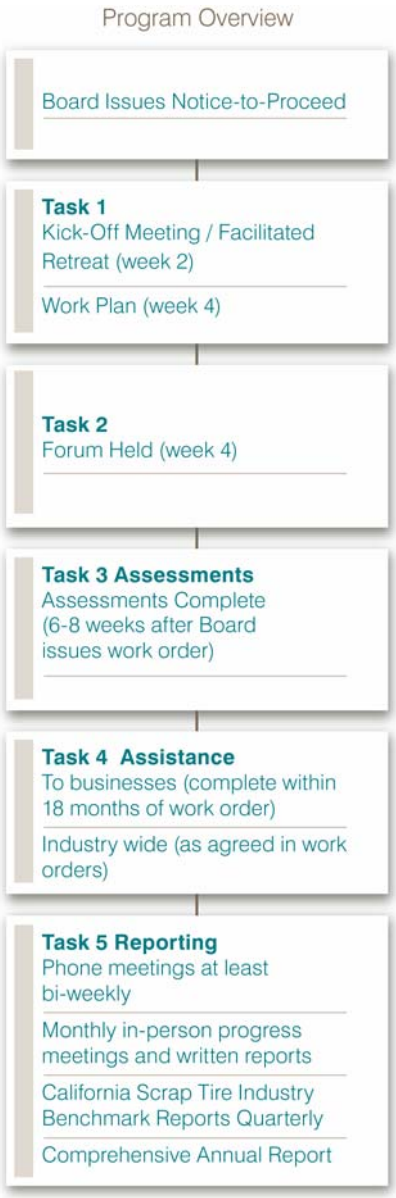
Task 3 Conduct Comprehensive Analyses and Prepare General Business Needs Assessments

Objectives:

- In coordination with Board Staff, prepare comprehensive General Business Needs Assessments that accurately identify and prioritize business assistance needs;
- Maximize understanding and buy-in by each business client over the assessment conclusions and recommendations; and
- Achieve consensus among each business owners/manager, Board Staff and the lead assessment consultant over an assistance work plan identifying objectives, tasks, target dates and budget.

Key Strategies:

- The R. W. Beck team will coordinate closely with Board Staff and prepare a clear business information request form identifying essential data needs to expedite assessments.
- R. W. Beck's Program Manager will optimize assessment assignments and scheduling to minimize assessment costs.



- Lead assessment consultants will recommend that certain time consuming, in-depth assessment activities determined to be a priority be undertaken during the assistance phase to shift costs and reduce assessment time.
- All assessments will include a confidential industry benchmark report and will be concisely prepared using a standardized template to reduce costs.

Task 4A Provide Business Assistance Services

Objectives:

- Deploy team resources as efficiently as possible to provide timely, professional services that result in measurable benefits to businesses and recycling markets.
- Ensure continual improvement in services by soliciting feedback from the Board and business clients.

Strategies:

- R. W. Beck acts as service broker, optimizing the allocation of team resources.
- Business assistance task leads act as the primary service advocate for assigned business clients, ensuring a high level of satisfaction.
- A broad consulting pool provides access to specialized expertise and additional general business consulting skills, ensuring resources are available when needed.
- The R. W. Beck team will leverage business and contractor team resources to maximize the amount of assistance provided.
- Volunteer industry advisors provide additional depth of specialized expertise where appropriate, with business client approval.

Task 4B Provide Industry or Sector Wide Assistance Services

Objective:

- Achieve significant, measurable and sustainable increases in demand for tire-derived products across the industry (or sectors).

Key Strategies:

- Emphasize “Demand-pull” efforts that boost demand for select, high growth products and customers;
- Where necessary, also target key barriers restricting expansion of tire-derived product production;
- Forge and expand long-term strategic partnerships; and
- Use a systematic decision making process to analyze options and prioritize actions.

Task 5 Reporting

Task 5 Objectives:

- Provide monthly and annual reports with up-to-date information on business assistance activity, work order status, budget and recommendations to optimize Program performance.

Key Strategies:

- The R. W. Beck management team and support staff will use a customized spreadsheet program to track work order budgets, resource use and status, ensuring monthly reports are up-to-date.
- R. W. Beck will compile business client feedback and recommend Program implementation adjustments providing a regular mechanism for continual improvement.
- R. W. Beck's Program Manager will meet in-person at least once per month with the Board's Contract Manager, ensuring close communication and coordination.

Priority Market Expansion Opportunities

In response to RFP Question A, the R. W. Beck team believes that, omitting RAC, engineering and TDF uses as stated in the question, the three scrap tire market sectors with the greatest potential for growth over the next three years are:

- Use of ground rubber in sports surfacing products such as field turf, sold to stadium owners and other customers;
- Use of ground rubber in horticultural products such as mulch and colorized bark substitutes, sold to landscapers, nurseries, school districts and other customers; and
- Use of ground rubber in a range of molded products such as paving tiles and parking stops.

The R. W. Beck team recommends that the Board sponsor a six-strategy initiative as outlined below, working in close coordination with California tire-derived product producers and other partners. Costs to the State to implement the initiative could vary from $140,000 to well over $450,000, depending upon the scope of the effort. The R. W. Beck team estimates that an annual increase in California-generated waste tire diversion of 1.7 million PTE is reasonable and achievable as a result of fully implementing the strategies described above (in coordination with other Board activities), resulting in an increase in the total statewide waste tire diversion rate by over 4 percent. This equates to a unit cost of $0.08 to $0.26 per PTE, based on the cost estimate above. We feel these are reasonable and achievable targets, and that greater results may in fact be achievable, given the high growth potential in these markets and synergies with other Board efforts. The feedstock conversion initiative described below would further complement this effort.

Recommended Strategies to Expand Top Priority Scrap Tire Markets

Strategy
1. Recruit and Involve CA producers in a Cooperative Marketing Advisory Group.
2. Prepare a cooperative marketing plan for the three priority products targeting top priority customer types.
3. Document product characteristics and customer experiences.
4. Implement a targeted marketing plan using available Program resources, including: a) Develop key messages and associated Web, print and other collateral (conduct at least one focus group to test messages and materials); b) Make strategic, low-cost ad placements and media buys; c) Establish a cooperative Web site or portal to promote sales by all participating producers; d) Implement an e-marketing strategy targeting key customers; and e) Produce a resource kit for use at conferences and in executive briefings for key customer groups.
5. If partnerships and resources allow, conduct a branding campaign for California tire-derived products, including: a) Additional focus group and market research; b) Additional ad placements and media buys.
6. Provide training to CA producers on optimal marketing and how to leverage the cooperative marketing initiative.

Feedstock Conversion Strategies

In response to RFP Question B, the R. W. Beck team proposes the following approach in order to enable feedstock conversion of California firms that are candidates to switch all or a part of their raw material needs to recycled rubber:

- First, we will identify candidate firms, industry categories and suggested approaches in cooperation with California tire-derived product producers, appropriate trade associations and by accessing NAICS databases.
- Second, we will prioritize and rank candidate firms based on criteria that together describe the realistic potential for success (based on the potential for recycled rubber to enhance operating economics or provide competitive market advantages); and

- Third, because of the skepticism of many manufacturers regarding feedstock conversion, the R. W. Beck team will approach top priority candidates strategically and in cooperation with partners respected in their industry, providing documentation on the potential benefits of recycled rubber use in their industry.

R. W. Beck feels the Board's 50 million pound feedstock conversion target is reasonable and achievable, if all feedstock conversion efforts (including engineering applications and RAC) are considered, and if the R. W. Beck team's recommended initiative is fully funded and coordinated with existing state efforts. However, notwithstanding the significant growth potential and substantial synergy of efforts the Board has underway, feedstock conversion is notoriously slow, and some results of the initiative described above may be realized beyond a three-year horizon. This initiative could be implemented at a minimal level for as little as approximately $75,000, but would greatly benefit from a sustained effort with additional resources of approximately $150,000. Achieving the 50 million pound target, or 2.5 million PTE, would result in an increase in the statewide waste tire diversion rate of over 6 percent, over and above the 4 percent diversion rate increase targeted in the initiative described above.

Cost Proposals

As requested in the RFP and addenda, our cost proposal includes the following:

- A Cost Proposal Rate Sheet identifying all consultants expected to perform work under this contract, assuring the full range of consulting expertise and qualifications required to implement the Program;
- A Task 3 Cost Sheet proposing an average cost to conduct one comprehensive analysis and to prepare one general business needs assessment of $7,521.53;
- Two additional cost proposal sheets proposing a cost to provide business assistance services under Scenario A of $49,845.65 and under Scenario B of $174,185.47.

Additional Assistance Pledged to Leverage Board Funds

The R.W. Beck team will offer eligible firms participating in the Program additional funding for business assistance services through our Team's affiliation with the California Employment Training Panel (ETP) and with California utilities. Team members Manex and CMTC, both affiliates of the National Institute of Standards and Technology/Manufacturing Extension Partnership, have an existing contractual relationship with the ETP program that can offset up to 80% of the costs of select training services. Manex and CMTC can also tap programs through PG&E and SoCal Edison providing up to $25,000 for each company energy audit, subject to resource availability. For example, assuming the client firms meet eligibility criteria, through these programs we estimate that:

- Manex could provide an additional $3,007 in services to Bounce Back Sales, under Scenario A; and
- Manex could provide an additional $25,747 in services to World-Wide Tire Recycling under Scenario B.

We envision that the specific types of supplemental assistance would be agreed upon as part of our Program work order, in consultation with the client firm and Board staff.

Section 4 includes important notes and terms regarding our cost proposals

California Integrated Waste Management Board
Tire-Derived Product Business Assistance Program
Contract #IWM05030

SECTION 2
Methodology

JANUARY 2006

R·W·BECK

Introduction

This Section describes the R. W. Beck team's methodology for implementing all Program tasks. The Section begins with a description of our understanding of the Program, along with strategies addressing the key issues most critical to Program success. Briefly, our key strategies address the need for:

- Significant, documented results;
- Widespread support and participation by California tire-derived product firms;
- Efforts that reinforce and build upon the Board's substantial existing efforts;
- Efficiency to maximize the amount of business assistance provided; and
- A contractor team with great breadth and depth, able to respond to uncertain workloads.

Following this, we describe our methodology for implementing Tasks 1 through 5, as defined in the RFP. Finally, we present our responses to the RFP's two industry/sector wide market development questions. We have included our proposed methodology for hypothetical business assistance scenarios A and B in Section 3, Cost Proposals.

Because of the Program's complexity, and the need to convey our understanding of the Board's context and Program challenges, this methodology section is necessarily lengthy. We invite reviewers to use the abbreviated contents at right to reference specific methodology sections as needed.

Understanding of the Program

Program Objectives and Overview

The Tire-Derived Product Business Assistance Program is designed to increase demand for California tire-derived products by building capacity and improving cost efficiencies of tire-derived product businesses. This will strengthen the overall economics and resiliency of California's scrap tire recycling infrastructure, a critical step towards achieving the Board's ambitious 90 percent scrap tire diversion rate goal by 2015.

Under the Program, eligible businesses may apply for assistance to:

- Evaluate and improve their business plan and operations;
- Enhance marketing efforts;
- Test and certify new products; and/or
- Purchase necessary equipment.

The Board is seeking a contractor team to participate in the general business needs assessment and, upon authorization from the Board, provide identified technical assistance to each business. The contractor team may also provide services that benefit an identified sector or the waste tire management industry as a whole.

Context for the Program

The Program complements the Board's already substantial commitment to scrap tire market development, and effectively replaces the Waste Tire Commercialization Grant Program. Between 1998 and 2004 this grant program provided over $8.5 million to 40 firms involved in marketing scrap tires and/or producing tire-derived products. The new Program is designed to improve on previous commercial grant program by:

- Targeting most funds to established businesses with successful business models;
- Verifying the best use of Board funds through a comprehensive assessment of each participant; and
- Emphasizing long-term, structural business development over short-term expansion through equipment purchase.

The Program was developed within the context of the Board's broader scrap tire management and market development activities, including:

- The most recent Five-Year Plan for the Waste Tire Recycling Management Program, adopted in May 2005, which sets targets for over $32 million in annual waste tire management funding;
- The substantial body of past and current research, promotion, funding, technical assistance and policies the Board has undertaken to strengthen waste tire markets;
- Input from stakeholders through monthly Interested Parties Meetings, Committee/Board meetings and other stakeholder involvement activities;
- The Board's involvement in the National Resource Conservation Challenge, Tire Working Group, hosted by U.S. EPA, and especially Board staff's leadership role in the Ground Rubber Sub-Committee; and
- The wide range of related activities undertaken nationally by other states and groups like the Rubber Manufacturers Association, which often impact California markets either directly or indirectly.

The R. W. Beck team has participated in and closely tracked this evolving context, including discussions with many California firms involved in scrap tire management. This understanding allows us to hit the ground running, without a need for "coming up to speed" on past and ongoing efforts that influence the optimal approach to this new program.

Key Implementation Issues and Proposed Strategies

This ambitious Program will add depth and sophistication to the Board's existing, exemplary market development programs, and could provide a model for other efforts beyond waste tires, both in California and nationwide. However, to succeed, the Board and its contractor team must address several critical issues. The R. W. Beck team has anticipated these issues and identified strategies to address them head on, as summarized below.

The Program must result in significant, documented benefits to California's waste tire product manufacturing markets.

As a new approach that differs markedly from traditional grant programs in California and other states, the Program is likely to be scrutinized by stakeholders and decision makers at the Board and the legislature. The ultimate measure of success will be documented, hard facts describing the benefits to individual companies and to the statewide scrap tire recycling market as a whole, and marking clear progress towards the Board's goal of 90 percent scrap tire diversion by 2015.

Strategy : Prepare and regularly update a California Scrap Tire Industry Benchmark Report to increase awareness of the program's benefits.

The R. W. Beck team proposes to compile the benchmark report using data from firms participating in the Program, and, if requested by the Board, will conduct a broader survey of the state's industry. The aggregate report will be updated as new firms move into the Program, and firms will receive an individualized, confidential benchmark report comparing their performance to industry averages as part of their general business needs assessment. If approved by the Board, we also propose to update individual business benchmark reports at the close of the contract to document improvements. If sufficient numbers of firms are available, the benchmark report will also cover select industry sub-sectors.

Strategy: Emphasize two fundamental recycling market development principles—demand-driven growth and overcoming specific barriers— to maximize Program benefits.

The R. W. Beck team believes that markets are strongest when they are driven by strong and growing customer demand. This allows all California tire-derived product producers to compete on a market basis, resulting in greater strength, resiliency, and growth over time. Consequently, we will emphasize analysis of markets for tire-derived products in both individual business assessments and in industry (or sector) wide efforts. Additionally, we will seek to target Program funds as strategically as possible to identify and overcome specific barriers that restrict the growth and resiliency of individual firms and market sectors.

Tire recycling firms and other stakeholders must actively support and participate in the Program.

California scrap tire recycling firms are the most critical Program stakeholders as success is directly dependent on their strong support and participation. During the Board's monthly Interested Parties meetings, and in R. W. Beck interviews, we've heard both strong enthusiasm as well as a degree of skepticism over the Program.

Sample of California Tire Business Perspectives on the Program

Positive Views	Concerns
May use State funds more fairly, efficiently and effectively.	The State's contractor must be highly capable and have the right range of skills and expertise.
Helps ensure State funds are used to build strong companies likely to succeed.	The process for applying, being assessed and receiving assistance must be clear and timely.
Helps ensure that all firms compete for state funds on a level playing field.	There must be clear safeguards for handling confidential information and not compromising the competitive advantage of participating firms.
May provide firm owners with new strategies and practices they didn't know they needed.	The amount of funds used to directly assist businesses should be maximized.

Strategy: Regularly solicit feedback and make continual improvements to ensure business client satisfaction.

The R. W. Beck team will consider participating businesses, along with the Board, as our respected clients. R. W. Beck's program manager will regularly solicit feedback from the Board and all participating businesses on a regular basis. We will discuss feedback and appropriate team adjustments with the Board's Contract manager and with stakeholders during in-person meetings to be held at least monthly in conjunction with interested parties meetings. Because R. W. Beck will rely on subcontractors for many business assistance services, we can play the role of an objective service broker, evaluating options alongside the Board's contract manager to identify opportunities to improve services wherever possible.

Strategy: Clearly document and promote business benefits to boost their interest in the Program.

The R. W. Beck team will assemble an information package describing the Program, our team's strengths and services, and a small number of case studies demonstrating the benefits to participating firms. These materials will be used in the Forum (Task 2) and throughout the Program via Internet and other channels. We will also compile client testimonials as the Program progresses.

Strategy: Adopt aggressive policies safeguarding confidentiality and competitive position to alleviate business concerns.

The R. W. Beck team will prepare a clear policy regarding treatment of confidential and sensitive information and emphasize this in all interactions with current and prospective client firms. All team members will sign confidentiality agreements, covering both the program as a whole and separately for each business client. Furthermore, unless requested by participating firms, we will avoid assigning any individual team member to work as the advocate for two directly competing firms.

Industry wide market development efforts must mutually complement and build upon the Board's substantial past efforts and strategies.

The Board's waste tire market development program is the best funded and most mature in the country. With overall waste tire management funding of over $32 million per year, Board efforts have yielded a diversion rate of over 73 percent, the nation's highest percentage diversion to high-value ground rubber markets and the highest sustained use of RAC in the nation. Such an expansive program also presents challenges in assimilating lessons learned, compiling data, and tracking overall progress. Future efforts, especially on the industry wide level, must be strategically tailored to clearly complement and build upon past efforts.

Strategy: The R. W. Beck team will leverage its familiarity with prior Board efforts, California waste tire markets and our commitment to involving scrap tire industry and other stakeholders to develop new and expanded Board opportunities.

Leading members of R. W. Beck's team have worked closely with Board staff on waste tire and other programs for more than 15 years. We will use this understanding and our dedication to industry and other stakeholder involvement to ensure that new efforts build and expand upon existing partnerships and other opportunities.

The Program must be implemented as cost efficiently as possible to maximize direct business assistance services.

Some businesses have raised the concern that the new program may be less efficient in delivering benefits than the traditional commercial grants program it replaces. Some cite as a justification for this concern the fact that the Program is new and unproven, with many uncertainties such as the number, type, size, and complexity of participating businesses and the types of assistance sought. Some businesses also cite uncertainties related to the process for approving, assessing, and delivering assistance, and the potential problems in coordination among the Board, Contractor, and businesses. These concerns may peak during the Program's initial months, with the need to simultaneously refine assessment process coordination, finalize a work plan, and complete the first batch of assessments, likely to be the largest number at any one time during the entire 30 month contract.

Strategy: The R. W. Beck team will leverage the Board's resources by providing eligible firms with direct access to at least $250,000 in additional training services through the California Employment Training Panel, plus energy auditing services through California utility-sponsored programs.

The Corporation for Manufacturing Excellence (Manex) and California Manufacturing Technology Consultants (CMTC), both members of the National Institute of Standards and Technology's Manufacturing Extension Program, each have a contractual relationship with California's Employment Training Panel that provides direct to funds for training California manufacturing industry employees, with a focus on small and midsize manufacturers. The program provides cost offsets of up to 80 percent for a wide range of training involving manufacturing management and tactical topics. Manex is pledging to allocate a minimum of $250,000 in matching funds to the Tire-Derived Product Business Assistance Program, subject to availability of funds for curriculum development from the Board and/or participating

businesses. Manex and CMTC also can access utility-sponsored energy audit programs for up to $25,000 per business. We will use these programs wherever possible to offset the costs to the Board of business assistance services, allowing the R. W. Beck to provide supplemental assistance services beyond that which Board funding would otherwise allow.

Strategy: Experienced program managers will broker services and coordinate the team, minimizing the administrative burdens of lead assessment and assistance consultants.

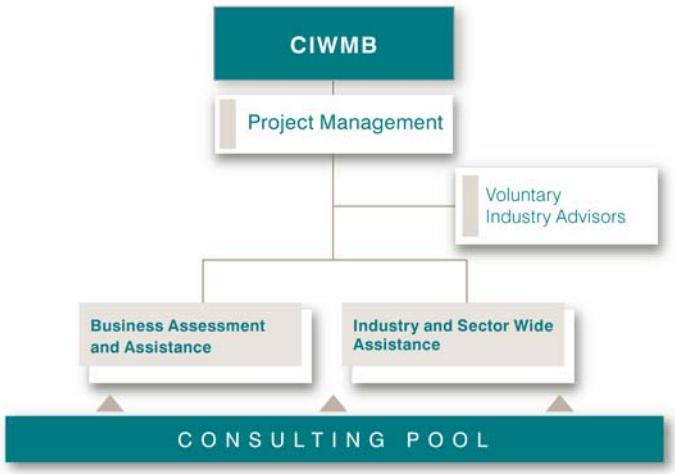
R. W. Beck's program management team, lead by Ed Boisson with assistance from Karl Hufnagel and support staff, has deep experience managing and coordinating complex projects while emphasizing quality assurance and close communication with all parties. We will track work order commitments and progress using a customized spreadsheet tailored to the Program, and will stay in close communication with all parties involved in the Program to ensure mutual satisfaction and efficiency.

Strategy: The R. W. Beck team will leverage business client resources where possible, and has reduced hourly billing rates to maximize the impact of Board funding to Program recipients.

The R. W. Beck team will seek to maximize the amount of services provided to client firms within the Board's funding caps. We will encourage business clients to participate to the maximum extent in all assistance tasks, and/or to use other consultants outside of the Program where they choose, allowing Program funds to flexibly fill top priority service gaps. Second, our lead assessment and assistance consultants have agreed to reduce their hourly rates for this Program, in order to meet the Board's needs for efficiency. A final approach we will employ is to reduce consulting hours by relying on a small, core assistance team that builds cohesion, institutional memory, and depth of expertise on the California waste tire management industry over time.

Due to uncertain work load requirements, the Program requires a contractor team with great breadth (amount or resources available), depth (range of expertise) and flexibility.

The new Program is likely to attract a large number of businesses involved in many different market segments, with correspondingly diverse needs and capabilities. Board staff estimates during the 30 month contract approximately 15 existing, expanding, and conversion businesses may be approved for up to $175,000 in assistance, and approximately 22 small and non-production businesses may be approved for up to $50,000 in assistance. Board staff has further indicated that all eligible applicants will receive a general business needs assessment. Additionally, the Board has reserved $250,000 for industry wide or specific sector strategies to be determined during the program. These elements have the potential to result in occasionally very high work load requirements, although the mix and schedule of consulting needs is impossible to predict in advance.

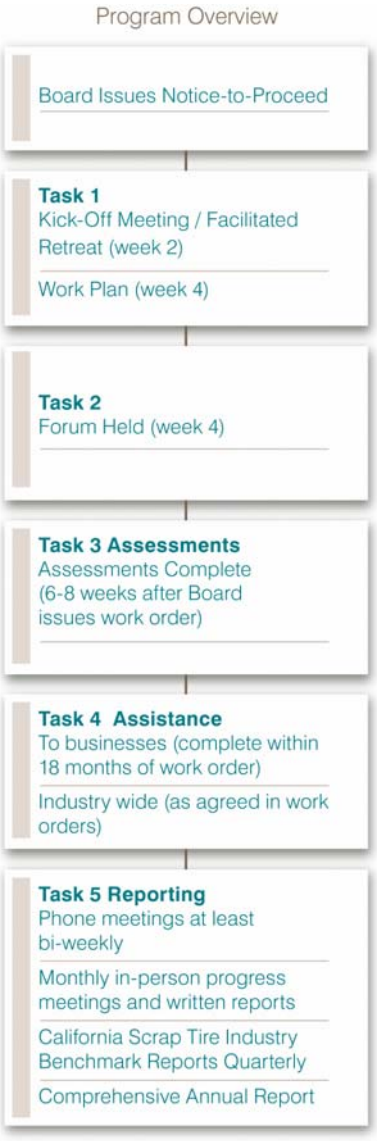


Strategy: The R. W. Beck team is structured to offer breadth and depth, while building cohesion among a small team of managers and task leaders. The R. W. Beck team is organized into three distinct functions as shown in organization chart on the following page, grounded with a small, cohesive core team of individuals that will be responsible for the majority of business assessment and assistance tasks. The team also offers breadth through a sizable consultant pool of diverse, experienced professionals, available to work on the program when their specific expertise is needed, or when additional people are needed due to workload spikes. (The R. W. Beck team is described in detail in Section 5.)

Strategy: The R. W. Beck team anticipates the need for flexibility and adaptation to continually improve performance. The R. W. Beck team has deep experience working on recycling industry development projects with the Board and other state agencies in California and throughout the nation. Given the uncertainties over actual workload and the need to refine procedures for a brand new program, we anticipate the need to work closely with Board staff to make occasional adjustments during the program that optimize efficiency and effectiveness. Moreover, our team structure provides a high degree of flexibility that will optimize our ability to deliver services where and when they are needed.

Strategy: We will maintain close, sustained communication with the Board's contract manager and client firms to keep all stakeholders in alignment with Program goals and objectives.

R. W. Beck will strongly emphasize the need for close communication in every aspect of program implementation, especially related to "staying on the same page" with the Board's contract manager and client firms. Given the complexity of the program, there will be no substitute for verbal and written communication at every stage.



Methodology for Implementing Tasks 1–5

Introduction

The issues and proposed strategies presented above broadly summarize the R. W. Beck team's approach to implementing the Program. This section presents in detail our proposed methodology for the five tasks described in the RFP.

The diagram to the right summarizes Program tasks and a proposed time line. In short, we are prepared to hit the ground running immediately upon receiving a written Notice-to-Proceed from the Board. This is especially critical given the immediate workload spike we anticipate and the need to simultaneously refine coordination steps, finalize a work plan, and conduct assessments of the Program's initial applicants.

Task 1: Develop Work Plan

Task 1 Objective: Working with the Board's Contract Manager, clearly document the schedule, roles and responsibilities, data needs and confidentiality policies for all aspects of program implementation.

Key Strategies:

- An immediate kick-off meeting and facilitated work plan brainstorming retreat keep the program on-track during an initial work load spike.
- Periodic work plan adjustments allow for continual performance improvements based on feedback from client firms.

Milestones and Target Dates:

- Draft work plan with key discussion issues (within 1 week after notice-to-proceed);
- Kick-off meeting and facilitated retreat (within 2 weeks of notice-to-proceed);
- Finalized work plan (within 1 week of receiving Board Staff's comments; by March 15 assuming a February 15 NTP).

This task is critical to the R. W. Beck team's overriding strategy of ensuring efficient program implementation because it will establish expectations, timeframes and Board/contractor communication and coordination practices. Furthermore, because we anticipate that upon receiving the notice-to-proceed Board Staff may have already received the initial batch of business applications, it will be necessary to complete the work plan very quickly.

Immediately upon receiving the Board's notice-to-proceed, the R. W. Beck program manager will schedule a kick-off meeting with Board Staff and key team members to be held ideally within two weeks in Sacramento. We envision providing the Board with a draft work plan prior to the kick off meeting that includes a detailed schedule for:

- Performing a comprehensive analysis of applicant businesses and preparing the Assessment for each business;
- Providing Board-authorized technical assistance to identified businesses; and
- Making presentations to stakeholders, the Board and/or the Board's Committees.

Managing the program will likely involve occasional adjustments to the work plan to allow for improvements in Program performance as lessons are learned. We envision working with the Board as appropriate to update the work plan. Also, under this task R. W. Beck will administer work orders during the program, including managing invoices, updating or revising work orders or subcontractor agreements as necessary.

We also envision including with our draft work plan a list of key issues and suggested strategies for discussion during the kick-off meeting. Among the issues we anticipate addressing at the meeting are:

Work order processing must be streamlined to eliminate delays.

- **Strategy:** R. W. Beck will prepare a standardized work order template and budget for a range of tasks (to be modified based on each client's unique circumstances) to simplify budgeting during the program.

- **Strategy:** R. W. Beck will prepare a draft work order for Board review covering all work during at least the initial 3 months of the contract, helping ensure work begins immediately.

Business applicant data needs must be defined and coordinated immediately.

- **Strategy:** The R. W. Beck team will facilitate a discussion at the kick-off meeting to finalize a standardized data and information request form (See draft in Appendix A) to simplify Board Staff's and businesses' efforts to complete applications.

Common expectations for assessment reports must be established.

- **Strategy:** The R. W. Beck team will prepare a standardized template for assessment reports for review at the kick-off meeting to both establish expectations and minimize costs.

A clear and aggressive policy on handling sensitive and confidential information is needed.

- **Strategy:** R. W. Beck suggests the following elements be included to alleviate business concerns:
  - Ask businesses to identify confidential information and concerns in their application;
  - Restrict information access to lead consultants working with each business;
  - Require all team members to sign a general confidentiality agreement covering their participation in the entire program, as well as a specific confidentiality agreement covering their work with specific businesses;
  - Require any team member to recuse himself from working with a particular business if there is any possibility of a conflict of interest; and
  - Work with the Board to identify other guidelines for identifying and handling such information.

Task 2: Stakeholder Forum

Task 2 Objective: Secure strong support and participation in the Program by California waste tire management firms.

Key Strategies:

- A forum emphasizing real-life benefit examples and team services boosts businesses' awareness and interest.
- Regularly updated collateral is available on the Internet and is widely distributed, allowing the Board to capitalize on Program successes.

Milestones and Target Dates:

- Draft work plan with key discussion issues (within 1 week after notice-to-proceed);
- Kick-off meeting and facilitated retreat (within 2 weeks of notice-to-proceed);
- Finalized work plan (within 1 week of receiving Board Staff's comments; by March 15 assuming a February 15 NTP).

This task supports the R. W. Beck team's strategy of building support for the program among the California waste tire management business community. In addition to promoting the program and the specific range of services and benefits businesses can expect, we envision using the forum as an

opportunity to clarify expectations over process and assistance mechanisms for those businesses that may have already applied for the Program's initial cycle.

We envision preparing a draft Forum agenda identifying objectives, participants, handout materials and our general approach for discussion with Board staff. We envision the forum will be a half day event held in Sacramento, and broadcast on the Internet and accessible by conference call participants, held in conjunction a monthly interested parties meeting. Then, we will prepare a draft power point presentation and hand-out materials for Board Staff review. Our presentation will highlight the R. W. Beck team's qualifications, experience and the range of services and benefits that participating businesses can expect. We assume the Board will assist in marketing the Forum via its existing communication channels of the interested parties list serve, other electronic mailing lists and its web site, and that the Forum will be broadcast over the Internet and available via conference call lines.

After the Forum, we will work with Board Staff to make sure Forum materials are updated and used to promote the Program in future application cycles. As we work with firms, we will solicit testimonials and prepare brief case studies documenting benefits. With Board approval, we also propose taking additional steps to market the Program, for example, attending trade shows and other meetings where businesses in top priority market sectors may be in attendance.

Task 3: Conduct Comprehensive Analyses and Prepare General Business Needs Assessments

Task 3 Objectives:

- In coordination with Board Staff, prepare comprehensive General Business Needs Assessments that accurately identify and prioritize business assistance needs;
- Maximize understanding and buy-in by each business client over the assessment conclusions and recommendations; and
- Achieve consensus among each business owners/manager, Board Staff and the lead assessment consultant over an assistance work plan identifying objectives, tasks, target dates and budget.

Key Strategies:

- The R. W. Beck team will coordinate closely with Board Staff and prepare a clear business information request form identifying essential data needs to expedite assessments.
- R. W. Beck's Program Manager will optimize assessment assignments and scheduling to minimize assessment costs.
- Lead assessment consultants will recommend that certain time consuming, in-depth assessment activities determined to be a priority be undertaken during the assistance phase to shift costs and reduce assessment time.
- All assessments will include a confidential industry benchmark report and will be concisely prepared using a standardized template to reduce costs.

Deliverables and Target Dates:

- Assessment Coordination Meeting (within one week of receiving applicant information from the Board)
- Assessment Assignment and Coordination Schedule (within one week of the Assessment Coordination Meeting)
- Draft Assessments Submitted to Business and Board (within 8 weeks of Assessment Coordination Meeting)

- Assessment and Assistance Work Plan Consultation (1 week after Draft Assessment submitted, subject to Board and Business availability)
- Overall Assessment Summary Meeting (1 week after all consultations are complete, or upon request of Board Contract Manager)
- Aggregated Benchmark Report (4 weeks after all assessments complete)
- Confidential Individual Benchmark Reports (Initial Cycle: 6 weeks after all assessments are complete. Later cycles: included in draft assessment).

Following is a description of our proposed methodology for comprehensively analyzing businesses and preparing general business needs assessments. As requested in the RFP, this methodology is the basis for our cost proposal presented in Section 3.

The assessment is the lynch pin of the entire Program. It determines the services each business will receive (and consequently how they will benefit), and also constitutes clients' the first interaction with the R. W. Beck team. Consequently, the process must be efficient and deliver tangible benefits. Moreover, because we anticipate that the Board may have already received the first batch of business applications prior to issuing a notice-to-proceed, there will be an urgent need to refine expectations and coordinate the process as soon as possible. As described under Task 1 above, we envision addressing these issues immediately as part of the program kick-off meeting, including preparing a standardized template for brief assessment reports.

Proposed Process for Preparing General Business Needs Assessments

The adjacent diagram summarizes our proposed business assessment process, emphasizing the need for coordination among the R. W. Beck team, Board Staff and participating firms. Our proposed process is based on the Board's draft "Tire-Derived Product Business Assistance Overview" (as revised December 29, 2005) and discussions during monthly Interested Parties Meetings.

Step 1. Businesses submit applications to the Board, along with initial data and information requested.

Step 2. The Board's Market Development and Scrap Tire Management Staff coordinate application review, verify and compile data/information and conduct an initial site visit. Board Staff then provides information on the applicant businesses to R. W. Beck's Program Manager.

Step 3. R. W. Beck's Program Manager schedules an Assessment Coordination Meeting to be held approximately one-two weeks after receiving applicant information from the Board (subject to Board Staff availability). The meeting objectives are to refine schedules, and to coordinate and review preliminary findings and outstanding data needs regarding each firm. As appropriate, select

contract team members with relevant expertise on industry niches and/or volunteer industry advisors may be invited to provide input during select portions of the meeting. We envision that R. W. Beck's Program Manager will attend the coordination meeting in-person, with other lead assessment consultants participating by phone.

Step 4. Following the coordination meeting the R. W. Beck team's lead assessment consultants assigned to each business will conduct the assessment. The lead assessment consultant will either be one of the team's three Business Assessment and Assistance task leaders (Brent Meyers of Manex, Dan Hauschild of AMPros or Jeffrey Lissack of R. W. Beck,), or another senior team consultant working in coordination with a task leader. We are prepared to conduct up to 30 assessments as described in this section within a very aggressive time frame of 6 to 8 weeks. We envision assessments will typically begin with a Kick-Off Meeting with business executive management (generally by phone) to:

- Define expectations, roles and responsibilities;
- Review the process and data/information requirements and outstanding needs; and
- Work with company management to identify company personnel resources to assist in data gathering and tentatively schedules site visit.

The lead assessment consultant will then work via phone, email and fax to gather outstanding information and data and confirm source, content and meaning as necessary. Along with Board Staff (and coordinated by R. W. Beck's Program Manager), the lead assessment consultant will visit the business site to view processes, review and discuss preliminary observations and interview executive management. Objectives of the site visit are to ensure that that the assessment consultant accurately understands the business operation, markets and goals, to build a trusting relationship with owners/managers and to clearly articulate next steps and mutual expectations. Following the site visit the lead assessment consultant will analyze data, information and findings, including (as available):

- Analyzing operational data and evaluating equipment and process capabilities and capacity;
- Reviewing organizational structure and management systems;
- Reviewing business plans, marketing tools, strategies and goals;
- Comparing operational capabilities versus financial performance versus business plan, strategy and goals;
- Establishing and/or identifying performance indicators; and
- Identifying and prioritizing assistance recommendations with approximate budget and time requirements.

A key part of the assessment is to review documentation pertaining to markets for the company's products. As part of this effort, consulting and/or volunteer advisors (with company approval) may be tapped for advice and broad perspective. Finally, the lead assessment consultant will compile the information into a brief assessment report, using a standardized template. We envision providing a confidential benchmark report to each firm assessed through the Program, as described under Step 7 below.

Step 5. To finalize the assessment we envision a final phone and/or in-person consultation with each business and Board staff to review prioritized recommendations and agree on all elements needed for a work order to be issued.

Step 6. R. W. Beck's Program Manager will summarize all assessment results and meet with the Board's Contract Manager to coordinate the Board approval process and issuance of work orders to begin the business assistance phase of the program (described under Task 4). And, as possible, we will combine these meetings with monthly status meetings (described under Task 5).

Step 7. The R. W. Beck team proposes to prepare a statewide aggregate and confidential individualized benchmark reports. The standardized benchmarks will be based on data provided by participating firms. The aggregate benchmark report will include business performance measures, market development measures and program measures compiled from all participating businesses. Additionally, we will provide each business with a confidential, individualized report comparing their performance with industry averages, and identifying implications. For the first application cycle, we envision providing the aggregated and individual benchmark reports within 6 weeks of completing all assessments. In future cycles, businesses will receive a benchmark report as part of their assessment report. R. W. Beck will update aggregated statewide benchmark data within 6 weeks of the completion of each assessment cycle. To safeguard confidentiality, data from at least 15 firms is required for an aggregate report. If sufficient firms participate, we will prepare aggregated benchmark reports on market sectors. We will work with Board staff and the business community to ensure that confidentiality concerns are respected and addressed concerning the benchmark reports and all other Program aspects.

Factors that Affect Business Assessment Cost
Objectives and Expected Results of the Assessment
Availability of needed data
Ability and commitment to obtain data that is not readily available
Low quality of data provided
Delays in providing data
Business size
Number of facilities
Process complexity
Business model complexity
Product mix
Number of products and product lines
Number of products and product lines
Number of employees

The Challenge of Estimating Assessment Cost

Estimating the time and cost to conduct an assessment is challenging because of the need to establish common expectations with Board staff regarding the scope and results of assessments, and because factors unique to each business client will serve to either raise or lower costs.

The most important cost determinate is the defined objective and expectations for the amount of "assistance" to be provided during the assessment. Among business owners, managers and assistance providers, perceptions of what constitutes a comprehensive business assessment vary greatly.

In our team's experience, comprehensive assessments are often viewed as a significant assistance task in and of themselves and may be conducted over several weeks or months, with extensive involvement by business owners, executive managers, operational and marketing staff and others, through multiple site visits and work tasks. The output of such assessments typically involves detailed results developed with and by executive managers involving all assistance areas envisioned for the Board's Program, such as business strategy, marketing, process efficiencies and product development.

Based on a review of the Board's Program documents and numerous discussions during Interested Parties meetings, we assume the Board is interested in a much more streamlined assessment that, while comprehensive, focuses mainly on providing a "reality check" on the types of assistance requested by business applicants, and accurately identifies and prioritizes the types of assistance that would provide

the most benefit. Consequently, the R. W. Beck team is proposing to conduct General Business Needs Assessments that are comprehensive in that all aspects of each business will be considered and evaluated, but abbreviated in that the primary objective is to identify and prioritize assistance needs. At the Board's request, we are prepared to abbreviate our proposed approach even further, with an eye towards striking the optimal balance between cost/time minimization and thorough analysis and involvement of company owners/managers.

Strategies to Minimize Assessment Costs

During the initial few weeks of our contract, the R. W. Beck team anticipates working closely with the Board to refine assessment expectations and minimize the costs of the business assessment process. Following are some of the key strategies we envision employing.

The R. W. Beck team will coordinate closely with Board Staff and prepare a clear information request form identifying essential data needs to expedite assessments.

Obtaining quality data is usually the single most costly step, though costs can sometimes vary in unexpected ways. For example, large firms have complex data but may be more likely than smaller firms to have systems and staff to facilitate providing it. Our experience shows that some companies of all types may struggle mightily to gather needed information without knowledgeable, hands-on assistance.

Based on discussions with Board staff, we assume the Board will be undertaking as much of the data collection effort as possible. The R. W. Beck team will clearly identify information and data needs and coordinate with Board Staff to ensure their data gathering efforts are focused on the information that is most essential for completing assessments. We will defer to Board staff to the extent possible to assist with data collection, and will be available to work directly with client businesses as needed, including (with clients' permission and oversight) directly accessing company databases. We envision that in many cases essential data and information needs will be covered through the firm's Program application, business plan, marketing plan and other available planning documents (e.g., strategic plan or quality plan), along with three years of complete financial statements (including accountant's notes and a description of accounts), along with select, additional information to be determined as lead assessment consultants work with businesses. However, we have provided a draft, sample data request form in Appendix A, showing the complete range of data and information that our team typically requests to conduct a detailed, comprehensive General Business Needs Assessment. We envision working with the Board to prioritize these data needs and to include the form in Program application materials.

R. W. Beck's Program Manager will optimize assessment assignments and scheduling to minimize assessment costs.

We will make every effort to assign assessments and schedule site visits (in coordination with Board Staff) to minimize costs. This includes combining several site visits into a single trip where travel is required, and considering geographic location in making assignments. We also will consider Assessment Team members' expertise and experience in making assignments, and we envision that some team members may develop and enhance their expertise in particular market sectors as the Program continues.

Lead assessment consultants may recommend that certain time consuming, in-depth assessment activities be undertaken during the assistance phase to shift costs and reduce assessment time.

As described above, the line between "assessment' and "assistance" may become blurry within the Program. The R. W. Beck team will focus assessment resources on a comprehensive assessment that identifies and prioritizes the types of assistance most needed by firms. In some cases, certain in-depth assessment tasks necessarily involving assistance-related activities may be recommended as part of the assistance phase of the Program. For example, to minimize costs, lead assessment consultants may

review and evaluate equipment and process efficiency data to the extent necessary to determine whether additional, technical evaluation of process efficiencies is a top priority relative to other business needs.

All assessments, including a confidential industry benchmark report will be brief and will be prepared using a standardized template to reduce costs.

The R. W. Beck team will prepare a standardized template for assessment reports based on the results of facilitated work plan retreat discussed under Task 1, to be held within two weeks of receiving the Board's notice-to-proceed. We envision that the template will lead to assessment reports that are as brief as possible, emphasizing top-level conclusions, supported by references to company documents provided. We also envision that confidential individual benchmark reports comparing company performance with industry averages will be prepared in a standardized format and be very brief.

Task 4: Providing Technical Assistance

We have divided Task 4 into two parts, based on the description given in the RFP, as follows:

A) Assistance to Individual Businesses (the primary focus of the Program); and

B) Assistance to Industry Segments or the Industry as a whole.

We describe each of these separately below.

Task 4A Assistance to Individual Businesses

Task 4A Objectives:

- Deploy team resources as efficiently as possible to provide timely, top quality services that result in measurable benefits to businesses and recycling markets.
- Ensure continual improvement in services by soliciting feedback from the Board and business clients.

Strategies:

- R. W. Beck acts as service broker, optimizing the allocation of team resources.
- A core team of lead assistance consultants act as the primary service advocate for assigned business clients, ensuring a high level of satisfaction.
- A broad consulting pool provides access to specialized expertise and additional general business consulting services, ensuring resources are available when needed.
- Volunteer industry advisors provide additional depth of specialized expertise where appropriate.

Deliverables and Target Dates:

- Draft assistance work orders prepared for Board review. (within 4 weeks of the Overall Assessment Summary Meeting, Step 6 under Task 3)
- Provide assistance (ongoing beginning in April 2006, as defined in work orders).

Providing assistance to scrap tire management businesses is the primary focus of the Program, and will comprise by far the lion's share of funds allocated. This section describes our general approach to providing business assistance. Specific proposals for business assistance scenarios A and B, as presented in the RFP, are presented in Section 3. These scenario proposals illustrate how the R. W. Beck team will apply the general business assistance methodology presented below to establish priorities, allocate team resources and provide assistance on time and on budget.

The diagram below illustrates the business assistance process. No more than four weeks after R. W. Beck's Program Manager meets with the Board's Contract Manager to finalize the assessment cycle results, R. W. Beck will provide draft work orders detailing the assistance to be provided to all firms approved in the cycle for Board Staff consideration. The draft work orders will be prepared in a standardized format (as developed in Task 1) documenting the R. W. Beck Team's plan for providing assistance as agreed during the Assessment and Work Plan Consultations held with each firm.

Assistance will commence immediately following Board approval of work orders, according to the agreed upon schedule. The assistance will be provided in a timeframe and manner acceptable to the Board and the business, and will be completed within 18 months of being authorized by the CIWMB Contract Manager. We anticipate proposing language in work orders that clearly identifies when consultant actions are dependent upon commitments by the business and/or others.

Throughout the program, R. W. Beck will solicit feedback from businesses and discuss it with the Board's contract manager in monthly progress meetings held in Sacramento. We will seek to make adjustments as needed to maximize Program efficiency and effectiveness.

R. W. Beck's overriding objective is to deploy team resources as efficiently as possible to provide timely, top quality services that result in measurable, tangible benefits to businesses and recycling markets. The following sections describe the strategies R. W. Beck will use to achieve this objective.

Strategy: R. W. Beck acts as a service broker, optimizing the allocation of team resources.

R. W. Beck's program management team will be responsible for overall coordination, quality control and resource allocation for assistance tasks, in addition to providing specific assistance services in some cases. R. W. Beck's role includes evaluating and recommending to the Board opportunities for synergy in industry or sector wide activities, and opportunities to tap additional resources through the California Employment Training Program through Manex's and CMTC's existing contract.

Strategy: Business assistance task leaders act as the primary service advocate for assigned business clients, ensuring a high level of satisfaction.

R. W. Beck's program manager will work closely with the business assessment and assistance task leaders, Jeffrey Lissack, R. W. Beck, Brent Meyers, Manex and Dan Hauschild, AMPros. These individuals will serve as primary client advocate for firms assigned to them, either providing services directly and/or coordinating the services of other lead assistance consultants. In most cases, lead assistance consultants will be staff of Manex (for Northern California firms) and CMTC (for Southern California firms). As work load, specialized assistance needs or other factors dictate, the R. W. Beck Team may assign consultants from Carderock or other partner organizations to act as lead assistance consultant for certain client firms. Where possible, Manex and CMTC will explore the potential to tap Employment Training Panel and Utility energy audit programs to offset Board assistance costs, allowing our team to provide supplemental services beyond what Board funds would otherwise allow.

Strategy: A broad consulting pool provides access to specialized expertise and additional general business consulting services, ensuring resources are available when needed.

As service broker, R. W. Beck will closely coordinate and allocate the full range of consulting resources available through our team, including industry volunteers where appropriate and where specifically approved by firms. R. W. Beck's Program Manager will work with the lead assistance consultants assigned to each business to determine who will contribute most effectively and the optimal manner to coordinate involvement by other team members. Lead consultants will coordinate team members on-the-ground in working with clients, while R. W. Beck will provide broader coordination and oversight.

The R. W. Beck Team provides direct access to the full range of assistance services to be provided under the Program. (The team is described in detail in Section 5, Qualifications and Resources.) The table on the following page summarizes the range of services that may be provided under the Program and the key team members or organizations that may be assigned to provide these services.

Strategy: The R. W. Beck team will leverage business and contractor team resources to maximize the amount of assistance provided.

During the Assessment and Work Plan Coordination Meeting to be held with Board Staff and businesses (Step 5), the R. W. Beck team will offer several avenues for stretching Program funds as far as possible, including:

- We will encourage businesses to reduce the cost of proposed assistance steps covered by Program funds by playing as active a role as possible (with their commitments memorialized in the work plan and grant agreement);
- We will explore opportunities to access training funds through the California Employment Training Panel, with which our two primary business assistance consulting organizations Manex and CMTC have an existing contractual relationship, through utility energy audit funding programs and through other programs as identified; and
- The R. W. Beck team will work cooperatively with other service providers that firms may choose to hire using funds outside of the Program.

Range of Assistance Services and Key Team Members

Category	Examples (As provided in the RFP)	Lead Team Members
General Business Assistance	Business plan development or modification, human resource issues, inventory management/control (including just-in-time inventory systems), asset management, appropriate business structure, appropriate or optimal financial structure, accounting systems and controls, and website development or modification.	Business assistance task leaders include Jeffrey Lissack (R. W. Beck), Brent Meyers (Manex) and Dan Hauschild (AMPros). These task leaders will provide assistance services and coordinate/oversee other assistance leads. Assistance leads are professionals from Manex (Northern California focus) and CMTC (Southern California focus), assisted as needed by professionals from Carderock. Other Team Members as Appropriate and As Needed
Technical Assistance	Efficient plant design, manufacturing process improvement or optimization, optimizing specific equipment performance, increasing the amount/percentage of recycled material, and converting to recycled material from virgin material.	The lead assistance consultants above will typically lead technical assistance efforts, with assistance from specialists such as: R. W. Beck: Ronald Perkins, Karl Hufnagel (scrap tire collection systems, process efficiencies), Herb Kostrin (scrap tire recycling technology evaluation, process efficiencies) Alan Moreland (ground rubber production and markets) Recycled Tire Research & Engineering Foundation: George Way, Gene Morris and Kamil Kaloush (paving, roads and engineering applications) Steve Branson (waste tire processing equipment) AMPros: Bill Laxson (business IT systems) Bottom Line Consulting: John Fearncombe (rubber-plastic blends, engineering, financial analysis)
Marketing Assistance	Marketing plan development or modification, product pricing, product promotion, product packaging, distribution systems, cooperative marketing, ad placement, trade shows, and internet marketing.	Depending on the scope of needs, lead assistance consultants may conduct marketing assistance or may coordinate with or defer to the following specialists: Riester Robb: Darryl Young, Mirja Riester, Stacy Witkowski and others listed in the Rate Cost Sheet (marketing strategy, branding, design of artwork, ads, web pages and other marketing collateral, production) Sierra Lake Group: Mike Tinney (marketing strategy, sales, sales to government agencies)
Product Testing and Certification	Testing products to satisfy the market place requirements of the public and private sectors.	Underwriters Laboratory: Lead by Thomas Fabian with others as listed in the Cost Rate Sheet (product testing and certification) Recycled Tire Research & Engineering Foundation: George Way, Gene Morris and Kamil Kaloush (select paving, roads and engineering testing services) *Additional Subcontractors where needed (subject to Board approval)*

Strategy: Volunteer industry advisors provide additional depth of specialized expertise where appropriate, with business client approval.

Finally, as clarified in the RFP, Addendum #3, R. W. Beck will recruit and coordinate a team of volunteer industry advisors that, where appropriate, will be invited to provide input and advice. We envision inviting participation from such organizations as the Rubber Manufacturers Association, the Institute for Scrap Recycling Industries, the US Green Building Council, the Tire Industry Association's Tire and Rubber Recycling Advisory Council and the Rubber Pavement Association. Such advisors will only be invited to participate where explicit, written approval is granted by client firms. We also anticipate soliciting involvement from other organizations and advisors in connection with sector specific marketing efforts, for example, trade associations involving landscapers, school officials, parks officials and other key customer groups.

Task 4B Industry Wide Assistance

Task 4B Objectives:

- Achieve significant, measurable and sustainable increases in demand for tire-derived products across the industry (or sectors).

Key Strategies:

- Emphasize "Demand-pull" efforts that boost demand for select, high growth products and customers;
- Where necessary, also target key barriers restricting expansion of tire-derived product production;
- Forge and expand long-term strategic partnerships; and
- Use a systematic decision making process to analyze options and prioritize actions.

Deliverables and Target Dates:

- To be determined during the contract via specific work orders.

The main focus of the Program will be providing assistance to individual firms that produce tire-derived products. However, the RFP states the contractor team may also provide services that benefit an identified sector or the scrap tire management industry as a whole, such as testing of materials or products, developing a coordinated marketing approach, branding products made from California recycled tires, web site coordination, documenting the benefits of tire derived products or marketing the Program itself.

This section summarizes our general methodology for evaluating and implementing industry and sector wide tasks. The approach is illustrated in our responses to the RFP Questions A and B, presented at the bottom of this Chapter.

The RFP Addendum #3 states that industry or sector wide activities may be identified during the Program:

- As common themes or needs resulting from the General Business Needs Assessments;
- From stakeholder input and/or surveys;
- Contractor recommendation; or
- Board direction.

We anticipate that Board staff also may identify such potential activities through participation in the US EPA's Resource Conservation Challenge/Tire Workgroup (especially the Ground Rubber Subcommittee), and through consideration of tasks proposed in response to the two related RFP questions in the consulting team proposals.

R. W. Beck market development specialists Edward Boisson and Betsy Dorn will take the lead in working with Board staff to identify and analyze opportunities, and develop strategies and work tasks. We envision involving other experts on our team as appropriate, for example, from ground rubber specialist Alan Moreland, roads engineers from the Recycled Tire Research & Engineering Foundation and branding/marketing specialist Darryl Young of Riester-Robb. As Board staff approves specific work orders for industry/sector wide tasks, R. W. Beck will deploy Team resources in a manner similar to that described for individual business assistance services in Task 4A above.

Strategies to Maximize Industry Wide Market Development Results

Following are the strategies we envision emphasizing in industry or sector wide market development tasks.

Strategy: Emphasize "demand-pull" efforts that boost demand for select, high growth products and customers.

R. W. Beck believes recycling markets are strongest when many production firms compete to capture market share within a growing, resilient market place. This reduces dependence on government actions and leads to long-term benefits for all tire-derived product producers equally.

Strategy: Where necessary, also target key barriers restricting expansion of tire-derived product production.

In some cases, important barriers may restrict growth in tire-derived product production. In these cases it is efficient and necessary to use state resources to overcome barriers and kick-start production expansion.

Strategy: Forge and expand long-term strategic partnerships.

Wherever possible, forging long-term strategic partnerships, for example with trade associations and organizations with similar objectives, allows state market development objectives to be promoted long after funds have been exhausted.

Strategy: Use a systematic decision-making process to analyze options and prioritize actions.

R. W. Beck has successfully used a systematic decision-making process to analyze recycling markets and develop priorities for strategies and actions in several states. This process could be used across the entire California waste tire recycling industry, or as a screen for validating and refining proposed tasks involving a single sector. Our approach is described in the next section.

Process for Analyzing Options and Prioritizing Actions

The R. W. Beck team will draw on past experience while working closely with the Board to ensure market development activities provide the greatest possible benefit. R. W. Beck has successfully used the following four-step decision-making process in several other states to analyze market expansion opportunities and prioritize implementation strategies and action plans. This general methodology is the basis for our responses to the RFP's two industry wide market development questions (presented in detail below). Subject to Board approval, we propose using or adapting this methodology as appropriate during the Program to evaluate and identify priority market development tasks.

Step 1. Involve the tire recycling industry and other key stakeholders to identify and analyze opportunities and develop/implement strategies.

This helps build support and ensures that the analysis and resultant action strategies accurately reflect current conditions. We envision participating in the Board's monthly Interested Parties meetings to and, where needed, also conducting targeted outreach to additional key groups.

Step 2. Document market segment status and trends.

This includes quantifying scrap tire generation, capacity and throughput in different market segments; identifying key facilities and players in California; and, most importantly, identifying the key trends in each submarket and the factors influencing them. The Board's 2003 report "California Waste Tire Generation, Markets and Disposal," provides broad market segment size estimates, and the Board has analyzed certain market segments in detail. We envision drawing from such Board information, our own experience and where necessary, additional proposed research tasks, to verify findings regarding market status and trends.

Step 3. Identify and describe market expansion opportunities and barriers for key segments.

The R. W. Beck team believes that recycling markets are healthiest when government intervention is minimized and markets are allowed to evolve unfettered. The primary role of government market development programs, then, is to identify and address barriers that impede market expansion, and to pro-actively kick-start markets once these barriers are removed. (See Table below.) There is broad consensus on the key barriers affecting some tire-derived product markets, for example, for coarse ground rubber products like playground material, as we discuss in responses to the RFP's two questions below. However, to our knowledge, the Board has yet to conduct a comprehensive market analysis identifying market expansion barriers and opportunities across all market segments. We envision conducting brief, targeted market interviews and other research as directed by Board staff to verify the analysis of particular market segments.

Categories and Examples of Market Expansion Barriers

Category	Example
Information	A key barrier for many tire-derived products with low customer awareness and acceptance. Ex: Schools may not understand the safety and longevity benefits of tire-derived playground coverings.
Economics	The waste tire supply chain suffers from inherently poor economics, with tip fees used to provide revenue for processing in early stages.
Access to financing	Some companies emphasizing unproven technologies or targeting new product development may have difficulty securing financing.
Technology	The technical characteristics of tire rubber and lack of proven, high performance manufacturing technologies may hinder use of recycled rubber in some molded product applications.
Institutional	Historical product practices and supplier relationships hinders demand for many relatively new tire-derived products.
Regulatory	State permitting requirements may hinder siting of new facilities in California.
Infrastructure	California's relatively small rubber industry hinders efforts to market ground rubber to producers currently using virgin raw materials.

Step 4. Develop a strategic action plan.

Once the opportunities and barriers are documented, the next step is to consider the full range of institutional capabilities available to address barriers and realize opportunities. This involves considering staff and resources at the Board, but also the Board's many current and potential strategic partners such as other state, federal and local agencies, trade associations, non-profit organizations and university centers. This leads to an evaluation of the potential results achievable through pursuit of a given opportunity, and identification of the strategies (e.g., intentional use of available resources) most likely to succeed.

Task 5: Reporting

Task 5 Objectives:

- Provide monthly and annual reports with up-to-date information on business assistance activity, work order status, budget and recommendations to optimize Program performance.

Key Strategies:

- The R. W. Beck management team and support staff will use a customized spreadsheet program to track work order budgets, resource use and status, ensuring monthly reports are up-to-date.
- R. W. Beck will compile business client feedback and recommend Program implementation adjustments providing a regular mechanism for continual improvement.
- R. W. Beck's Program Manager will meet in-person at least once per month with the Board's Contract Manager, ensuring close communication and coordination.

Deliverables and Target Dates:

- Brief monthly update reports (submitted by the 15th of each month).
- Comprehensive Annual Reports (beginning June 30, 2006)

Given the need to coordinate work orders covering many different firms and involving Board Staff and several R. W. Beck team consultants, regular reporting and close communication between R. W. Beck's Program Manager and the Board's Contract Manager is imperative. R. W. Beck will customize a spreadsheet program for use in tracking all Program implementation activities, including work order budgets, assistance status, resources expended and resources remaining. We will use the spreadsheet as a basis for preparing brief monthly reports using a common template. We will also compile in monthly reports feedback solicited from business clients and elsewhere, along with recommendations for Program adjustments and/or recommendations for industry (or sector) wide tasks.

Most importantly, R. W. Beck's Program Manager will meet in-person at least monthly with the Board's Contract Manager to review monthly reports and discuss status and next steps. We envision requiring brief status reports from Team Members by the 7th of each month, allowing R. W. Beck to submit monthly reports to the Board by the 15th, with in-person meetings scheduled in advance shortly thereafter. To the extent possible, we will attempt to combine monthly status meetings with other proposed meetings, such as Assessment Coordination Meetings (discussed under Task 3).

The R. W. Beck team will also prepare a comprehensive annual report drawing from the monthly reports, and also including the annual California Scrap Tire Industry Benchmark Report, discussed under Task 3 above. We envision that the annual report will provide a comprehensive report on the Program, including:

- Program performance measures (e.g., number of firms assisted, type of assistance, etc.);
- Business performance measures (e.g., productivity, employment, etc.); and
- Market development performance (e.g., throughput, capacity, sales, etc.)

Response to Question A – Priority Industry Wide Market Development Opportunities and Strategies

Recycled tires have a variety of uses. What three market segments (other than rubberized asphalt concrete, civil engineering applications and tire derived fuel) hold the greatest potential in the next three years for diversion of California generated tires?

The R. W. Beck team believes that, omitting RAC, engineering and TDF uses as stated in the question, the three scrap tire market sectors with the greatest potential for growth over the next three years are:

- Use of ground rubber in sports surfacing products sold to stadium owners, horse arenas and other customers;
- Use of coarse ground rubber in horticultural products like mulch and loose fill playground material, sold to school districts, landscapers, nurseries and other customers; and
- Use of ground rubber in a range of molded products.

Our analysis below is based on Board data on 2003 waste tire market data, discussions with numerous California scrap tire management firms and Board staff, participation in the Board's Interested Parties meetings, our team members' experience and national sources like the Rubber Manufacturers Association's 2003 Market Analysis and the November 9, 2005 revised analysis prepared by the Ground Rubber Subcommittee of US EPA's Tire Workgroup. Subject to Board approval, we propose to seek additional input from California tire-derived product producers and conduct additional research to verify and refine the analysis.

Estimated Markets for California Produced Ground Rubber (2003)[1]

Market	Amount (Millions of Pounds)
Rubberized Asphalt Concrete (RAC)	52.0
Sports Surfacing, Horticultural and Other Ground Rubber Products	54.4
Molded Products	13.6
Total	120

Why Sports Surfacing and Horticultural Products?

Production of these ground rubber products is growing rapidly in California and nation wide. In California, production of coarse ground rubber in 2003 was estimated to be approximately 54 million pounds. Producers in California include BAS Recycling (San Bernardino), CRM (Compton) and West Coast Rubber Recycling (Gilroy). Sports surfacing products like field turf used in stadiums with artificial turf, are experiencing rapid growth. Some feel that customer awareness and sales of these products are growing on their own, based on the product's significant, demonstrated performance benefits. Others, however, feel there is still a need for joint marketing activities such as independent verification of product performance. Horticultural products like mulch and colored bark substitutes, on the other hand, have very large potential markets, but many stakeholders feel these markets are stymied by a widespread lack of customer awareness and understanding of potential performance and cost benefits. While grant programs in California and other states serve to boost sales and have an unquestionable positive benefit in the market place, there is strong concern that these customer groups must be willing to purchase tire-derived products in greater quantities outside of the price offsets government grants provide. California already has several producers of coarse ground rubber, and production of sports surfacing and horticultural products could quickly be expanded. These firms are prime candidates for the business assistance services offered through this program, and are likely to be participants on an annual basis.

Why Molded Products?

Molded products like car stops, carpet underlay and paving tiles typically use ground rubber between 10 and 45 mesh. A wide variety of products can be manufactured, and there is a growing amount of innovation in this arena. Producers/distributors of tire-derived molded products in California include

[1] These estimates are subject to verification and refinement. Assumptions: 1) Estimates for RAC ((2.6 million PTE) and other crumb rubber (3.4 million PTE) are from "California Waste Tire Generation, Markets and Disposal: 2003 Staff Report." 2) Assumes 80 percent of "other" ground rubber is primarily used for sports surfacing and horticultural products, and 20 percent for molded products, and that other ground rubber products not listed constitute a small percentage of the overall market. This breakdown is based on a recent R.W. Beck study of New York ground rubber production and on discussions with CA producers. 3) We assume Board staff used a conversion factor of 20 pounds per PTE in reporting ground rubber in the 2003 market report. This assumption is not explicitly stated in Board staff's market analysis, however, and Board staff has recently adopted a conversion factor of 12 pounds ground rubber per PTE, accounting for steel and nylon by-products. Using the 12 pounds per PTE conversion would reduce the market estimates by 40 percent.

Rubber Sidewalks (Gardena) and Advanced Rubber Surfacing Products (Gardena). Some California produced ground rubber likely flows to molded product producers in other states. In 2003 use of California-produced ground rubber in molded product markets is estimated at approximately 13.6 million pounds (based on extrapolation from data from other states – see footnote above). California's relatively small rubber industry presents a barrier to expansion of tire-derived molded product production. However, molded products are an attractive target for several other reasons. First, there are California producers and distributors actively seeking to grow, and important demand side barriers are impeding that growth. Second, a small amount of ground rubber is produced as a by-product of coarse ground rubber production, and California producers are increasingly in need of a market for this material. Third, rapid growth in coarse ground rubber markets may not be sustainable over the long term (as markets become satiated, annual sales may decrease). Consequently, even if the molded product sector grows slowly, it may hold greater promise to provide long-term, high value market for years to come. And fourth, creating a solid supply infrastructure and providing incentives can help to promote the siting of new molded product manufacturing facilities in California. Finally, while small, there are molded product facilities in and near California that are candidates for converting to use of California produced ground rubber as raw material. These feedstock conversion opportunities are covered in the section below, under Question B.

Why Not Focus on Other Sectors?

Apart from the three segments the Board excluded within Question A, two sectors must be noted. First, sales of coarse ground rubber derived sports field products, as noted above, have strong growth potential. This sector was not identified as a priority because it appears to be thriving independent of government support. The second sector to be noted is the use of ground rubber products in the production of new tires. This is a very controversial topic, and certain key stakeholders such as the Rubber Manufacturers Association has made their opposition to promotion or regulation of this sector very clear and vocal. However, tire manufacturing is far and away the largest use of SBR rubber (the type of rubber used in tires), and even when used in very small percentages, represents a potentially huge market. While California no longer is home to a major tire producer, it is possible that California producers could gain market share by selling to facilities in other states, if they are positioned to efficiently produce high quality supplies and negotiate a complex supplier certification process. Despite the controversy, some tire producers have and do use small amounts of recycled tire rubber. If oil prices rise, this will only augment the potential economic benefits to tire producers. Because of the controversy and supply-side barriers associated with this sector, we have not identified it as a recommended priority here.

What would both the public (State) and private sectors need to do in order to optimize that potential? Tell us what specific action plan and budget you recommend for the State, describe the specific services your team would perform for the public and private sectors?

Strategies, Actions and Roles

The R. W. Beck team recommends that the Board sponsor a six-strategy initiative as described below, working in close coordination with California tire-derived product producers and other partners. These proposed strategies are designed to address the key barriers to market expansion presented in the table below. The barriers are presented in two groups. The first row presents the key barriers to expansion of sports surfacing, horticultural and molded products currently made with recycled rubber . The main barriers to these three products are generally the same and involve the need for increased customer demand through better information systems (recommended Strategies 1–5) and training to assist producers in better marketing (recommended Strategy 6). The second row presents an additional set of barriers restricting growth in the use of ground rubber by molded product producers not currently using recycled rubber. These mainly supply-side barriers are more complex and involve the need for

information on ground rubber raw materials, institutional attitudes, quality of the supply infrastructure information, economics and technologies for producing molded products with ground rubber. Strategies addressing these barriers are discussed separately under Question B below.

Key Priority Market Expansion Opportunities and Key Barriers

Priority Market Segment Growth Opportunities	Key Barriers
Use of Ground Rubber in Sports Surfacing Products (e.g., field turf) Use of Coarse Ground Rubber in Horticultural Products (e.g., mulch) Use of Ground Rubber in Molded Products Already Made with Recycled Rubber (e.g., tiles)	Institutional/Information – Customer concern over environmental health and safety issues, performance and cost. Information – Low customer awareness and familiarity with tire derived product alternatives. Economics/Information – Lack of resources for sufficient marketing and branding by producers and distributors. Institutional /Infrastructure – Perception and reality of some inferior quality products on market. Institutional/Information – Lack of adequate quality and performance standards and insufficient documentation of particular products. Information – Lack of data on characteristics of ground rubber in some molded product applications.
Use of Ground Rubber in Molded Products Not Currently Made with Ground Rubber (e.g., gaskets, railroad ties, composite lumber products)	Information – Molded product Producers lack information on ground rubber supply, performance, price, manufacturing technologies, etc. Institutional – Molded product producers' concern over their customer perception of recycled products Economics/Infrastructure – Recycled tire feedstock may not be available at an acceptable quality, quantity or price Technology – Production technologies are unproven in some cases.

Strategy 1: Recruit and involve California producers as partners through a Cooperative Marketing Advisory Group.

California producers of the three priority categories of tire-derived products must be equal partners from day one. Furthermore, California producers of other types of tire-derived products should be involved to allow the program to be broadened if determined to be appropriate.

Actions: We recommend that the Board invite producers to participate in a Cooperative Marketing Advisory Group, to meet separately but in conjunction with Interested Parties meetings. Other stakeholders should be kept informed of progress through the Interested Parties meetings.

State Role: Invite participation and convene meetings.

Private Role: Commit to fully participate in the Advisory Group.

R. W. Beck Team Role: Recruit members, organize and facilitate meetings, document results.

Strategy 2: Using the three priority products as an anchor, prepare a strategic cooperative marketing plan for California tire-derived products.

The strategic marketing plan will identify the most effective approach to increase sales, given the resources and abilities of participating firms. The R. W. Beck team recommends beginning with the three anchor product groups, but an evaluation should be made during plan preparation regarding whether and when to expand the effort to involve other California tire-derived products.

Actions: Research for the plan includes documenting key customers, current and potential market size, analyzing competing products, documenting trends and factors affecting the market place. All appropriate partners and funding should be recruited. In conjunction with the Board and product producers, the consulting team will then facilitate development of strategies and an implementation plan. (This analysis in effect will refine and verify the recommendations presented here.)

State Role: Over see plan development, recruit participants, provide data and in formation, encourage participation from producers and other groups as appropriate.

Private Role: Provide data and information, share information on customers in confidence, contribute ideas and review and critique draft documents.

R. W. Beck Team Role: Conduct research, recruit partners, analyze data and information, develop and refine strategies and action plans.

Strategy 3: Document product characteristics and customer experiences.

This is the most important strategy since it is essential for addressing the key barriers of customer awareness and understanding over these tire-derived products. The effort should document comparative costs, longevity, environmental health and safety issues, and other product performance issues.

Actions: Gather information from California producers and their customers, with emphasis on sales supported by Board grants. Also compile existing information from other sources such as the Rubber Manufacturers Association. As needed, perform additional testing or other research to fill any gaps in available information. Compile results into a short report along with a number of case studies and customer testimonials.

State Role: Oversee research, provide data and referrals. Encourage participation in the research by grantees and other groups as needed.

Private Sector Role: Provide data and referrals. Review findings.

R. W. Beck Team Role: Conduct all research and testing, compile results into a short report with case studies.

Strategy 4: Implement a targeted marketing plan using available Program resources.

Many cooperative marketing steps can be implemented within the budget the Board has allocated for industry wide assistance. These steps have the potential to yield substantial results. We recommend at a minimum, starting with these.

Actions: The relatively low-cost cooperative marketing actions we envision include:

- Develop key messages and associated collateral such as print ads, a brochure, a Web site and possibly limited radio or TV placements (including at least three focus groups to test messages and materials);

- Make strategic ad placements and media buys as resources allow consistent with the overall strategic marketing plan;
- Establish a cooperative Web site and/or portal to promote and facilitate sales by all participating producers;
- Implement an e-marketing strategy targeting key customers;
- Produce a brochure, conference exhibit and brief power point presentation for use at conferences and for uses in executive briefings for key customer groups.

State Role: Oversee the effort and coordinate with other Board activities.

Private Role: Provide critical feedback and ideas to assist in developing messages, collateral and the deployment plan.

R. W. Beck Team Role: Conduct all research, design messages and materials and develop and implement deployment.

Strategy 5: If resources and partnerships allow, implement a broad branding campaign for slect products or for all California tire-derived products.

An aggressive and broad branding campaign would complement and build upon the more targeted, and lower resource marketing steps described under Strategy 4. The effort should be anchored on the three top priority products. Depending on research results and resources, the effort may also have a broader focus to promote California tire-derived products more generally.

Actions: Working closely with California producers and other strategic partners as identified and recruited above, conduct more thorough testing of messages and collateral and develop a three-year branding campaign and implementation plan. The campaign will involve more substantial ad placements, media buys and other outreach and partnerships than that covered under Strategy 4, and will have the objective of building long-term awareness of California tire-derived products as a brand.

Strategy 6: Provide training to California tire-derived product producers and distributors to strengthen their marketing plans and assist them in leveraging the state's cooperative marketing campaign.

To ensure the state's efforts have maximum effect, producers and distributors need to be trained on all aspects of the campaign, and their opportunities for accessing and leveraging materials and messages. The training program should also provide fundamental information to strengthen marketing plans in general.

Actions: We envision tapping into the contracts held by Team members Manex and CMTC with the California Employment Training Program to provide funds for conducting the training. Board or other resources would be required for curriculum development and promotion of the training. The training would likely take place in one or two sessions, and cover all aspects of fundamental marketing principles and approaches, and opportunities to benefit from cooperative marketing campaign.

State Role: Oversee training program development and outreach, promote the training program.

Private Role: Participate in the training and use results in marketing plans and efforts.

R. W. Beck Team Role: Develop curriculum, assist in promotion, conduct training and evaluate feedback. Team members Manex and CMTC will seek to secure funding through their contracts with the California Employment Training Program.

Estimated Budget

Estimating costs is challenging due to many implementation options and uncertainties. As shown in the table below, we estimate that the State should budget at least $140,000 for initiatives targeting expansion of these products, or over $450,000 if an aggressive branding effort and broad marketing campaign is envisioned. However, such an initiative could be structured in many different ways that would affect cost, and funding and support may be available to a degree from partners such as tire-derived product manufacturers/distributors, trade associations, U.S. EPA and possibly other states. Many tire-derived product producers feel the most urgent need is for the state to document product characteristics, as described under Strategy 3. If desired, a scaled down initiative could focus on this step, with reduced level of effort in planning and marketing activities.

R. W. Beck would welcome the opportunity to discuss more specific budgets, partnerships and work orders to undertake this initiative. The effort should ideally be conducted in an incremental, phased approach, beginning with a scoping exercise involving outreach to California tire-derived product producers.

Summary of Proposed Strategies and Approximate Cost

Strategy	Approximate Cost Range[2]
1. Recruit and Involve CA producers in a Cooperative Marketing Advisory Group.	$15,000 - $30,000
2. Prepare a cooperative marketing plan for the three priority products targeting top priority customer types.	$25,000 - $50,000
3. Document product characteristics and customer experiences.	$25,000 - $60,000[3]
4. Implement a targeted marketing plan using available Program resources.	$55,000 - $120,000
5. If partnerships and resources allow, conduct a branding campaign for California tire-derived products.	$0 - $150,000+
6. Provide training to CA producers on optimal marketing and how to leverage the cooperative marketing initiative.	$20,000 - $40,000
Total	$140,000 - $450,000+

What would be a realistic estimate for increased diversion, and explain the basis for your recommendation and estimate.

The R. W. Beck team estimates that an annual increase in California-generated waste tire diversion of 1.7 million PTE is reasonable and achievable as a result of fully implementing the strategies described above. This would boost the statewide waste tire diversion rate by over 4 percentage points. This equates to a unit cost of $0.08 to $0.26 per PTE, based on the cost estimate above. We feel these are reasonable and achievable targets, and that greater results may in fact be achieved.

[2] These are the estimated cost range for the R.W. Beck Team to implement each strategy. We welcome the opportunity to develop a more detailed budget upon request, in consultation with Board staff over initiative scope and Board-Contractor roles.

[3] The higher estimate reflects a need for product testing services.

These conclusions are based on the following assumptions.

- We assume that all of the increased demand resulting from the proposed market development initiative is supplied by sale of California-produced products made from California-generated waste tires.
- We use a conversion factor of 12 pounds ground rubber product sold per PTE diverted, consistent with current Board policy.
- We assume the following sales growth rates driven in part by the proposed initiative:
  - Sports surfacing and horticultural rubber product sales increase at an annual rate of 10 percent, or by an additional 18 million pounds annually in year 3; and
  - Molded product sales increase at an annual rate of 5 percent, or by an additional 2.1 million pounds in year 3.

Analyzing the California ground rubber market is challenging due to a lack of data. The following table illustrates the range of potential diversion increases that may be realized, assuming the base year production levels presented in the table above. While the percentage of all California coarse ground rubber product sales that is comprised of sports surfacing and horticultural products is not known, targeting these two product types would to some degree have a synergistic affect on the entire ground rubber product category. Given the rapid growth in these product markets currently being experienced, we assume that 10 percent growth over the next three years is a reasonable, achievable target. Increasing molded product sales is more challenging, and we assume that a 5 percent growth rate over the next three years is reasonable and achievable.

Three-Year Growth Scenarios for Targeted Tire-Derived Products

Targeted Product Type	Assumed Base Year Annual Sales[4]	5% Annual Growth		10% Annual Growth		20% Annual Growth	
		Annual Sales in Year 3	Increase Over Base	Annual Sales in Year 3	Increase Over Base	Annual Sales in Year 3	Increase Over Base
Sports Surfacing, Horticultural, and other Ground Rubber Products	54.4	63.0	8.6	72.4	18.0	94.0	39.6
Molded Products	13.6	15.7	2.1	18.1	4.5	23.5	9.9
Total	68.0	78.7	10.7	90.5	22.5	117.5	49.5

[4] Assumed base year annual sales is from the table presented under Question A above.

Response to Question B – Feedstock Conversion Strategies

Virgin rubber is used in many products. Some products that currently use virgin rubber may be able to use recycled rubber in various amounts. How would you identify, prioritize and approach California businesses to convert to using recycled rubber from California tires?

Successfully encouraging manufacturers currently using virgin raw materials to switch to using recycled raw materials is commonly referred to as *feedstock conversion.* Feedstock conversion is important because it can result in new demand for recycled materials, directly replacing virgin materials, thereby delivering the maximum amount of economic and environmental benefit. However, feedstock conversion may be the most challenging of all market development strategies because it necessarily involves requesting firms to consider changing one of the most fundamental aspect of their business model – the raw material they use to produce products and generate profits. Manufacturing business owners and manufacturers are understandably skeptical of such requests. Manufacturers have a strong incentive to optimize their operations, and feedstock conversion efforts are also necessarily based on an assumption that some manufacturers may have overlooked an opportunity to improve their performance through using recycled materials. Again, owners and managers are understandably skeptical of outsiders delivering such a message.

The R. W. Beck team proposes the following approach.

Identifying Opportunities

Scrap tire feedstock conversion opportunities can involve both products currently made with virgin rubber and product currently made from other materials that could be replaced with tire-derived products. The table below lists a range of possibilities.

The Range of Feedstock Conversion Possibilities

Market Category	Examples of Opportunities	Key Barriers	Examples of Current Board Level of Effort
Reuse	Replace new tires with partially worn tires	Poor Economics Quality Concerns Liability Concerns	Modest. Supported by promotion of better tire maintenance to prolong average tire useful life.
Ground Rubber	Replace portion of asphalt mix (RAC).	Institutional Infrastructure Sometimes Economics and Technology	A major focus. Already purchasing mandates, funding, research, information, marketing and promotion efforts.
	Replace natural products and cement in playground, sports surfacing, horticultural and other product markets.	Information - Customer Awareness and Understanding Infrastructure – Supply Quality and Quantity	A major focus. Funding supporting product purchases and for producers (through this program).

Market Category	Examples of Opportunities	Key Barriers	Examples of Current Board Level of Effort
Ground Rubber	Replace virgin rubber, polymers and other materials in molded and other products.	Information – Raw material characteristics Institutional – Producer and customer skepticism Technology – Some manufacturing technologies not proven Economics/Infrastructure – Quality and quantity of supply in some cases	Modest. Supported by Board programs like loans, grants, and targeted research projects. Tire-Derived Product Business Assistance Program is a perfect fit.
	Replace virgin rubber in new tires.	Institutional – Tire industry resistance. Information – Documentation of process and impacts not complete. Technology – May reduce performance.	Past research and exploration of the concept in some projects.
Civil Engineering Applications	Replace natural and other aggregates in: - Lightweight Fill - Drainage Medium - Road Base	Economics – Cost competitive only in specialized niches Information – Some characteristics still not proven Institutional – Agency and private customer skepticism Infrastructure – Need to meet supply specification	A major focus – Already supported through research, technical assistance, policies, information and promotion.
Other Recycling Applications	Replace a variety of materials with cut, stamped and other tire-derived products.	Varies. Typically institutional – customer skepticism Information – Documented product characteristics.	Supported by current programs, but not a major focus.

R. W. Beck proposes to identify the full range of potential opportunities and specific California firms that could be considered in feedstock conversion efforts. We will place special emphasis on categories that are not already the subject of major Board efforts (e.g., molded products and plastic composite products), but will also coordinate with Board staff to fill gaps in existing major efforts where needed (e.g., by identifying major asphalt and road construction firms). We will identify firms through the following steps:

1. Involve Stakeholders – Work with California tire-derived product producers to identify candidate market categories and specific firms/contacts.

2. Search Trade Associations and Other Appropriate Groups – We will identify appropriate trade associations and other organizations that are likely to involve firms that could potential convert to tire-derived products.

3. Search Databases – We will search for candidate firms using appropriate NAICS and/or SIC industrial categories, accessing state, federal and private databases as needed.

We assume that the Board will assist in providing access to data where possible, and in facilitating stakeholder outreach, for example, through monthly interested parties meetings.

Prioritizing Opportunities

There are a very large number of potential feedstock conversion opportunities involving the products listed in the table above. A key challenge is to identify which categories of firms and which specific firms are the most likely to convert to using recycled rubber after being approached and provided with assistance. Efforts should be targeted to those firms with the highest potential to realize a business benefit, such as reduced raw material or other operating costs, enhanced product performance and/or competitive advantage with key customer groups. We propose to use the following criteria to evaluate and rank candidate market categories and specific firms:

Criteria for ranking[5]:

- Is conversion to recycled feedstock likely to be driven by the manufacturers' customers?
- Will recycled feedstock improve production economics?
- Will feedstock conversion improve product performance?
- Are proven technologies available?
- Is there a proven supply infrastructure?
- Are candidate firms likely to be committed to investigating conversion to recycled feedstock?
- Is a feedstock conversion program targeting the firm/category likely to yield significant, positive results?

We propose to use an iterative process to cull out the top priority candidates, conducting preliminary research as needed and using these criteria to successively eliminate from consideration those market categories that are the lowest priorities. Once the list is manageable, we will then assemble a list of priority firms that can be approached in the next phase, and further prioritized.

Program manager Edward Boisson developed these feedstock conversion evaluation criteria for an analysis conducted for the Chelsea Center for Recycling Economic Development in 2000. This analysis, which covered all recycled material markets, found that use of tire-derived-aggregate in engineering applications, ground rubber in asphalt and ground rubber in molded products were among the top ten feedstock conversion opportunities in Massachusetts.

Approaching Candidate California Firms

Because of the sensitivity of manufacturers regarding promotion of feedstock conversion, the R. W. Beck team will approach identified priority candidates in a very strategic, incremental fashion. We propose the following steps.

1) Secure respected partners – Seek assistance from trade associations, industry leaders and others to provide letters, make referrals and/or become involved in the effort.

2) Document benefits and technical information – Compile existing information and, as needed, conduct new tests to document waste tire raw material characteristics, and tire-derived product characteristics, including price, performance, operational concerns, and health and safety issues. We envision working with the Board to maintain this information on the Board's web site, and also working with partners to identify appropriate dissemination strategies.

3) Distribute information and offer assistance – Send out a mailing with a short letter of invitation and offer of assistance, technical information and if possible, product samples. Use results to identify firms amenable to being approached. While responses will likely be low, those responding will be much more likely to respond to further efforts than those who do not.

4) Make follow up phone calls and site visits – Follow up the mailing with phone calls and site visits, starting with those who respond, but also contacting top priority candidates as resources allow. Ideally, partners will be recruited to participate with the R. W. Beck team and the Board in making executive briefing to owners and managers of top priority firms.

5) Provide assistance – Encourage firms to apply to the Program for assistance, and as resources allow, provide preliminary assistance to trigger their interest.

6) Document results – Maintain records on interest levels and lessons learned. Use this information to adjust efforts.

Tell us what specific action plan you recommend and why, what services would your team provide, and what else would be needed for California businesses to convert from virgin rubber and use an additional 50 million pounds of California recycled rubber per year within three years.

In short, R. W. Beck's recommended action plan is to undertake the steps described above to identify, prioritize and approach California firms with the highest potential to convert to using recycled rubber as raw material. However, we recommend that this be done in close coordination with California ground rubber producers and other key stakeholder groups, and that this initiative be closely coordinated and aligned with the many other related Board activities underway.

The six-step initiative defined above can be implemented at virtually any level of resources, although R. W. Beck recommends that a minimum of $75,000 be allocated to the effort, and a higher funding level of approximately $150,000 would allow for work with additional businesses. Based on our experience, results may take months or even years, due to the need for business owner/managers to make the decision to commit to investigating recycled rubber products, undertake the investigation and then retool and establish new supplier relationships to make the switch.

R. W. Beck feels the 50 million pound target is reasonable and achievable, if all feedstock conversion efforts (including engineering and RAC) are considered, and if the R. W. Beck team's recommended initiative is fully funded and coordinated with existing state efforts. However, given the challenges of feedstock conversion discussed above, we feel it is likely that the full benefits of the Board's initiative may take more than three years to materialize. The table on the following page presents one potential scenario for achieving this target. This scenario involves a very substantial increase in RAC (40%) and

civil engineering applications (65%) that may be achievable given the large potential in these sectors and the momentum of current efforts. The scenario also involves an increase in coarse ground rubber product sales of 10 percent, and in molded product sales of 5 percent. Both are assumed to be over-and-above the potential increases estimated for Question A above. A 50 million pound increase would increase the statewide waste tire diversion rate by over 6 percentage points.

One Scenario for Increasing Diversion by 50 Million Pounds Through Feedstock Conversion[6]

Product Category	Base Year Diversion	Total Percent Increase Over Three Years	Increase in Annual Diversion
Rubberized Asphalt Concrete	52.0	40%	20.8
Sports Surfacing, Horticultural and Other Ground Rubber Products	54.4	10%	5.4
Molded Products	13.6	5%	0.7
Civil Engineering	36.0	65%	23.4
Total	156.0	32%	50.3

[6] Base year diversion is based on Board staff's 2003 Market Analysis, assuming a conversion factor of 20 pounds per PTE for all products. As discussed under Question A above, Board staff has recently adopted a conversion factor of 12 pounds per PTE for ground rubber. We assume that the 2003 market analysis did not reflect that change. Converting Board staff's 2003 market estimates using 12 pounds per PTE for ground rubber would decrease the base year assumption in this table and reduce the diversion increases achieved.

California Integrated Waste Management Board

Tire-Derived Product Business Assistance Program

Contract #IWM05030

SECTION 3
Cost Proposal Sheets

JANUARY 2006

R·W·BECK

SECTION 3

COST PROPOSAL SHEETS (CONFIDENTIAL)

All information contained in Section 3, including the Rate Sheet, Task 3 Proposal Cost Sheet, and Scenario A & B Cost Sheets are confidential.

SECTION 3

RATE SHEET

SECTION 3

TASK 3 COST SHEET

SECTION 3

SCENARIO A & B COST SHEETS

California Integrated Waste Management Board
Tire-Derived Product Business Assistance Program
Contract #IWM05030

SECTION 4
Organization

JANUARY 2006

R·W·BECK

Team Organization

R. W. Beck has assembled a broad spectrum of firms to implement the Board's Tire-Derived Business Assistance Program (Program). Our team is structured to efficiently conduct business assessments and provide targeted assistance within a market-focused context. Qualifications and roles and responsibilities for key personnel who will be involved in the project are described in Section 5.

The following table introduces our team and describes the role that each firm or advisor will play.

Firm	Role
R. W. Beck, Inc.	Project Management and Administration, Scrap Tire Market Analysis, Strategic Planning; Co-Lead, Business Assessment and Assistance; Co-Lead, Industry and Sector Wide Assistance
Corporation for Manufacturing Excellence (Manex)	Co-Lead, Business Assessment and Assistance (Northern CA Focus)
California Manufacturing Technology Consulting (CMTC)	Business Assessments and Assistance (Southern CA Focus)
AMPros Corporation	Co-Lead, Business Assessment and Assistance; Lead, Benchmark Reports
Riester-Robb Pacific, Inc.	Market Planning, Web Site Development, Branding Campaign Design, Collateral Development, Production and Deployment; Co-Lead Industry and Sector Wide Assistance
Sierra Lake Group	Market Planning, Government Sales Specialist, General Business Assistance Support
The Carderock Group	Assessment and General Business Assistance Support
Underwriters Laboratory, Inc.	Product Testing and Certification
Alan Moreland, Ph.D.	Industry Specialist (Ground Rubber Production and Markets); Co-Lead, Industry and Market Wide Assistance
Recycled Tire Research & Engineering Foundation	Industry Specialists (Rubberized Asphalt Concrete, Other Road and Engineering Applications)
Bottom Line Consulting, Inc.	Industry Specialist (Rubber-Plastic Blends and Ground Rubber Manufacturing Applications)
Innovative Distribution & Manufacturing LLC	Industry Specialist (Scrap Tire Processing Equipment and Systems)
TL & Associates	Advisor on Industry and Sector Wide Assistance (CA Scrap Tire Industry and Board Programs)

Section 4 Contents

Firm Profiles

R. W. Beck, Inc.

Role: Project Management and Administration, Scrap Tire Market Analysis, Strategic Planning; Co-Lead, Business Assessment and Assistance; Co-Lead, Industry and Sector Wide Assistance

Since 1942, R. W. Beck, Inc. has been providing engineering and consulting services to solid waste, water, wastewater, electric, and thermal facility clients. The firm's collective experience spans four continents and includes projects worth a total of more than $150 billion. Our specific scrap tire management and market development background is described below.

R. W. Beck is not aware of any current or past employee or client relationship that may pose a conflict of interest in undertaking the Boards Tire-Derived Business Assistance Program

Scrap Tire Management Services

R. W. Beck has performed a tire market assessment and strategic plan for the State of New York, and has analyzed scrap tire markets as part of several other recycling market studies. R. W. Beck has assisted a number of state, regional, and local governments in the identification of tire recovery and market development alternatives. We have provided market, technical, environmental and economic analyses. We have evaluated the economic and technical feasibility of numerous private and public projects. The following is a brief summary of the scrap tire related services we have provided our clients.

Scrap Tire Market Analysis and Strategic Planning

- Document Market Players
- Document Supply and Demand
- Analyze Expansion Opportunities & Barriers
- Identify and Analyze Trends
- Facilitate Industry Involvement
- Develop Scrap Tire Market Development Strategic Plans and Implementation Plans

Analysis of Scrap Tire Generation and Processing Systems

- Estimates of tire generation rates and geographic distribution
- Verification of present operating systems
- Collection system planning
- Collection and process facility design
- Central and regional processing facility design
- Facility ownership options

Technology and Facility Reviews

- Economic and Financial Assessment
- System and component evaluations
- Operations and maintenance analysis
- Waste product disposal review
- Environmental/Regulatory assessment
- Market verification
- License and technology agreement review

Continuous Scrap Tire Disposal Systems

- Estimates of tire generation rates and geographic distribution
- Verification of present operating systems
- Collection system planning
- Collection and process facility design
- Central and regional processing facility design
- Facility ownership options

Recycling Market Development Related Services

R. W. Beck is considered by many to be the leading provider in the United States for recycling market development related services. Specific services provided by R. W. Beck related to recycling and market development include:

- State market development strategic planning
- Recycling industry economic/market research
- Supply/demand analyses
- Feedstock sourcing studies
- Stakeholder participation
- Database development
- Economic analyses
- Funding strategies
- Infrastructure assessments
- Business plan development
- Technology reviews
- Pro forma development
- Recycling market center development
- Policy review and recommendations
- Efficiency studies and reviews
- Modeling
- Economic impact analysis
- Additional related services

R. W. Beck Office Locations

R. W. Beck's Program Manager Ed Boisson works out of an office in San Rafael, CA, and will be supported by administrative services provided by our Sacramento and San Diego offices as needed. Currently, R. W. Beck has offices locations across the United States with more than 558 professional and support personnel.

The Corporation for Manufacturing Excellence (Manex)

Role: Co-Lead, Business Assessment and Assistance (Northern California Focus)

Since 1995, The Corporation for Manufacturing Excellence (Manex) has provided a broad array of proven solutions and resources exclusively to manufacturers, distributors, and their supply chains, enabling them to compete on a global scale. Manex uses a holistic approach, from strategy through implementation, to impact all facets of business performance. From Hayward, California, Manex helps companies turn business challenges into business opportunities by providing high-impact advisory and implementation services that help manufacturers increase growth, productivity, quality, and profitability.

With over two dozen practitioners (each averaging 20 years of executive, manufacturing, and consulting experience) in Northern California, Manex delivers services in four key areas: strategy, people, process and performance. These services include manufacturing-critical areas in corporate strategy and planning, marketing strategy, training and development, lean manufacturing, supply chain and logistics, Six Sigma, ISO, and performance management systems. Manex consultants are active members of industry-leading organizations, including the Association for Manufacturing Excellence (AME), the Society of Manufacturing Engineers (SME), the Association for Operations Management (APICS) and several have been recognized as experts in their field with Six Sigma Black Belt and APICS certifications, and NAM and Shingo Awards for manufacturing excellence.

As a member of the National Institute of Standards and Technology Manufacturing Extension Partnership program, Manex can augment its significant local breadth and depth of manufacturing expertise by drawing upon a national network of resources with expertise in best practices in manufacturing operations, methods, and processes. Manex also maintains active partnerships and alliances with local universities and community colleges, Economic Development Corporations, and other professional services firms.

Manex has an exclusive relationship with California's Employment Training Panel ("ETP") to manage and deploy funds for training of manufacturing industry employees, with a focus on small and midsize manufacturers with facilities in California. Manex is pledging to make available a minimum of $250,000 in training services to eligible businesses through the Board's Program.

California Manufacturing Technology Consulting (CMTC)

Role: Business Assessments and Assistance (Southern California Focus)

CMTC, a private non-profit 501(C)(3) corporation, was established in August 1992, to provide consulting services to the manufacturing industry, which includes distributors, in order to increase the competitiveness of manufactured products. Headquartered in Gardena, California, CMTC serves Central and Southern California through regional and industry-focused consulting teams that are strategically located to best serve California's industries engaged in the design, manufacturing, and distribution of products.

CMTC's core consulting services are Lean Enterprise Services, Quality Management Services, Information Technology Services, and Strategic Business Services. The firm focuses on key industry sectors that are important to the growth of various regions in California. CMTC's goal is to improve the efficiency and productivity of key industry sectors and ultimately strengthen the economy as a whole.

CMTC develops SME capability infrastructure and high-paying jobs in California, which, importantly, have a 3-5 job multiplier effect, critical to California's economy. CMTC builds and deploys expertise to close the productivity growth gap between SMEs and the large companies. Small companies, which represent 80% of job growth, lag large companies in increasing their efficiencies. The high cost of

outreach to SMEs puts them outside the range of traditional, for-profit firms offering technical expertise. CMTC services boost the productivity growth of these small companies resulting in a higher competitive SME industry.

CMTC operates through a cooperative agreement with the Manufacturing Extension Partnership (MEP) of the National Institute of Standards and Technology (NIST) of the U.S. Department of Commerce, and a Grant Agreement with the Manufacturing Technology Program (MTP) of the California Business, Transportation and Housing Agency. Extensive contractual agreements also exist with Community Colleges and other third party organizations to expand the firm's service and mission impacts. In support of its mission, CMTC has undertaken a supplier program to further enhance its ability to improve the capabilities of California small and medium-size enterprises (SMEs).

CMTC has an existing contractual relationship with California's Employment Training Panel ("ETP") to provide training for manufacturing industry employees, with a focus on small and midsize manufacturers with facilities in California. CMTC will make funds available to qualified firms participating in the Board's Program.

AMPros Corporation

Role: Co-Lead, Business Assessments and Assistance; Lead, Benchmark Reports

CEO and President Dan Hauschild founded AMPros Corporation (AMPros) on November 29, 1993. Since inception, the company philosophy has been to deliver solutions that are validated within the framework of our customer's overall business strategy. From their Maple Grove, Minnesota office, AMPros specializes in business transformation consulting and software that optimizes operational and financial performance, profitability improvement, enhanced process productivity and business survivability employing strategy development, benchmarking and customized decision support tools. AMPros develops customized solutions to achieve profitability and performance improvement, business alignment to strategies and sustainable competitive advantage. AMPros provides consulting services and products to manufacturing, retail, and distribution companies ranging from the emerging entrepreneurial to larger Fortune 500 businesses.

Riester-Robb Pacific, Inc.

Role: Market Planning, Web Site Development, Branding Campaign Design, Collateral Development, Production and Deployment; Co-Lead, Industry and Sector Wide Assistance

Riester-Robb Pacific, Inc. (Riester-Robb) began operations in Phoenix, Arizona during March 1989 with three employees and later incorporated in Los Angeles, California on October 25, 2000. Today with over 90 employees, $82 million in billing and offices in Los Angeles, Phoenix, Salt Lake City and Denver, the company is better equipped to respond to client needs than any other firm in the region.

Riester-Robb has created and implemented a number of public education campaigns including; recycling, tobacco education and prevention, pollution prevention initiatives, and healthcare programs for economically disadvantaged citizens of Arizona. The firm has also created and implemented successful campaigns motivating people to vote for initiatives including; increased tobacco taxes, clean indoor air, Indian self-reliance/Gaming, land preservation and more.

Sierra Lake Group

Role: Market Planning, Government Sales Specialist, General Business Assistance Support

The Sierra Lake Group (SLG) was founded in 1995, incorporated in 2004 and certified as a California Small Business the same year. SLG has offices both in Escondido and Sacramento, Ca. SLG is a marketing and sales company specializing in helping small and emerging companies develop and market sustainable products through a network of independent sales reps and distributors. Mike Tinney, senior partner, Sierra Lake Group, has worked as business development consultant to small and emerging companies throughout California. Most recently, as Tinney Associates he contracted with the RMDZ program of the CIWMB, providing business assistance to RMDZ financed companies needing business planning and marketing/ sales help. Those companies include SafePath Products and 3D Traffic Works, both companies producing products from recycled California tires. The project included marketing planning for product presentation and acceptance by the State of California through the Department of General Services. Connections were also made with independent sales reps who will sell the products produced on a commission basis to the appropriate retail distribution channels.

The Carderock Group, LLC

Role: Assessment and General Business Assistance Support

The Carderock Group, LLC (Carderock) provides advisory and interim management services to startup companies and electric utilities. Carderock works directly with companies, investors, developers, and energy firms, seeking industry, investment and transaction support, including business planning, due diligence support, deal structuring, financing, valuation, and risk assessment. The principals of Carderock will work directly with the existing management team or the investor community and will commit a significant amount of time to ensure that clearly defined objectives are met. Under certain scenarios, Carderock will invest their own capital.

The principals of Carderock have worked with several industry leaders in the utility sector. Clients have included PG&E, Bechtel, PPL, PacifiCorp, American Water, and InterGen (Royal Dutch Shell/Bechtel JV). Other clients have included Rocky Mountain Institute (RMI), Invensys, and a variety of private investors. Carderock has had direct experience with most power generation technologies, energy technologies, and fuel types. They also have experience with project financing and power marketing. In the past, Principals of Carderock have served as full-time or interim executives for companies in the energy, technology, and environmental industries.

The Principals of Carderock have worked together on projects for a number of years. The Carderock Group, LLC was legally formed in January 2005, formalizing this relationship. Carderock's main office is in San Francisco, California, and the Principals are located in San Francisco and Santa Rosa.

Underwriters Laboratory

Role: Product Testing and Certification

Underwriters Laboratory, Inc. (UL) is an independent, not-for-profit organization that provides product safety and certification testing. UL maintains 60 laboratory, testing, and service locations and 127 Inspection Centers serving customers in 99 countries. Since its founding in 1894, UL has held the reputation as the leader in U.S. product safety and certification. UL's independence allows them to objectively carry out and report on investigations of product and system compliance to internationally recognized standards.

UL is an integral part of the global conformity assessment system through the development of standards, evaluation of products, and publishing reports for use by insurers, buyers, inspectors, and consumers.

UL has clients across the entire supply chain, ranging from research and development on materials to public and private seminars. UL works with component manufacturers, OEMs, local specifiers and U.S. Customs. Additionally, UL staff train product designers and teach schoolchildren about safety.

UL expertise extends beyond testing to include inspection and compliance certification, as well as quality management systems evaluations, audits, and registrations. UL is a member of many industry and international standards making organizations including each of the 20 code-making panels of the National Electric Code. UL has developed more than 1,165 Standards for Safety, many of which have been adopted by ANSI as American National Standards. UL Standards are essential to public safety and confidence, cost reduction, quality improvement, and marketing of products and services.

Alan Moreland, Ph.D.

Role: Industry Specialist (Ground Rubber Production and Markets); Co-Lead, Industry and Sector Wide Assistance

Alan Moreland, Ph.D. is an independent ground rubber broker and a South Carolina-based consultant specializing in ground rubber production systems and tire-derived product markets. Mr. Moreland's expertise covers the full range of ground rubber, from coarse to ultra-fine, and the many products made from it. Mr. Moreland has over 35 years experience in the rubber and rubber recycling industry, and recently served for three years as Chairman of the American Chemical Society, Rubber Division's Rubber Recycling Topical Group. Mr. Moreland's career has centered on the technical and marketing aspects of the rubber industry and rubber recycling industries. In addition to a sound technical grounding, he has broad experience in manufacturing quality systems, sales, marketing and product development, especially in the rubber recycling area. For the past two years, Mr. Moreland has provided consulting services to several rubber recycling firms located throughout North America, has pursued market expansion opportunities with several customers and has provided ground rubber brokerage services.

Recycled Tire Research & Engineering Foundation

Role: Industry Specialists (Rubberized Asphalt Pavement, Other Road and Engineering Applications)

The Recycled Tire Engineering and Research Foundation (RTERF) is a Scottsdale, AZ-based 501-c3 non-profit affiliate of the Rubber Pavements Association (RPA) established in 2004. While affiliated with RPA, RTERF is autonomous and acts independently of RPA. RTERF is dedicated to providing for the beneficial use of recycled tire rubber by providing engineering information, technology transfer, training and education, and conducting or sponsoring research about the use of recycled tire rubber in all types and forms of engineering use. The members of the RTERF Board represent some of the most knowledgeable people in the field of asphalt rubber in pavements and crumb rubber in concrete in the world. RTERF's leadership who will be available to provide services to California businesses and industry through the R.W. Beck team include the chief engineers and researchers responsible for Arizona's pioneering use of recycled rubber pavement products over the past decades.

Bottom Line Consulting, Inc.

Role: Industry Specialist (Rubber-Plastic Blends and Ground Rubber Manufacturing Applications)

Bottom Line Consulting, Inc. (BLC) of Lake Barrington, IL was formed in 1987 to provide specialized business, finance and engineering services, with an emphasis on manufacturing applications for post-consumer rubber and plastics. BLC's direct experience in recycling plastic/rubber compounds includes

assisting several clients to optimize production processes in the automotive, lawn and garden, and telecommunications industries. In each case, BLC confirmed and enhanced the use of tire-derived ground rubber as a value-adding, impact modifier.

BLC services to recycling manufacturing firms include:

- Devising Custom Formulations to Reduce Cost and Enhance Performance;
- Trouble-shooting of Processing and Performance Problems;
- Developing Competitive Advantages Through Technical Innovation; and
- Fast-Tracking the Commercialization of Recycled-Content Products.

BLC also has experience working with producers of soft rubber products like gaskets, seals, and hoses where tire crumb can be combined with synthetic rubbers (typically ethylene-propylene elastomers, thermoplastic polyolefins, polybutadienes, or Neoprene).

Innovative Distribution & Manufacturing LLC (IDM)

Role: Industry Specialist (Scrap Tire Processing Equipment and Systems)

Innovative distribution & Manufacturing LLC (IDM) was formed in February of 1997 in Portland, Oregon. IDM includes several sub-companies and joint ventures all based on design and evaluation of recycling machines, spare parts, field service, and consulting. IDM has provided consulting services related to several custom built shredders. In 2002 IDM accepted a contract to install train and manage a crumb rubber production facility in Ohio. During this time IDM also provided consulting spare parts and service for tire recycling facilities in Indiana and Michigan. After the sale of the crumbing facility IDM has continued to provide consulting, spare parts and custom systems designs in the tire recycling market. IDM is currently located at 9 College St. in Poland Ohio.

TL & Associates

Role: Advisor on Industry and Sector Wide Initiatives (California Scrap Tire Industry and Board Programs)

Since 1994, TL & Associates has provided comprehensive assistance to California-based tire recyclers and product manufacturers, those contemplating establishing tire-derived businesses, and public agencies involved with the management of waste tires. Located in Fair Oaks, California, TL & Associates assist companies with regulatory, economic and "tire flow" issues as well as market analyses. Additional services provided include supplying information, advice, and grant assistance to private and public sector entities that want to divert waste tires from California's landfills and process those tires into value-added feedstock or marketable products.

TL & Associates also publishes the California Tire Report, a twice-weekly update on issues and events affecting the state's tire recycling industry. Now in its eleventh year of publication, the Report is widely read by tire industry insiders throughout the country. It reports on changes in California laws and regulations affecting tire recyclers, tire dealers, and waste tire haulers. Additionally, it monitors the tire grants, contracts, and loans that the state of California offers to private firms and the public sector.

Terry Levelle, president of TL & Associates and editor of the California Tire Report, is a former Community College instructor, Chief of Staff to a member of the California State Assembly, Press Secretary and Legislative Aide to a member of the California State Senate, and Advisor to the Vice-Chair of the California Integrated Waste Management Board.

California Integrated Waste Management Board

Tire-Derived Product Business Assistance Program

Contract #IWM05030

SECTION 5
Qualifications & Resources

JANUARY 2006

R·W·BECK

Team Qualifications & Resources Aligned With Program Needs

The R. W. Beck team offers a depth, breadth, and flexibility of services that will be critical to successful implementation of the Business Assistance Program. Key team members that will lead the effort have highly respected qualifications in the following areas:

- Managing complex programs with many partners;
- Manufacturing business and technical assistance;
- Marketing and branding strategies;
- Commercial Web site design and e-sales systems;
- Product testing and certification;
- Scrap tire recycling processes and markets; and
- Recycling market development analysis and state program strategic planning.

As the prime contractor, R. W. Beck will leverage our program management and market development capabilities to focus and provide context for all Program tasks, while deploying select staff as appropriate to complement and support our partners in business assessment and assistance tasks. R. W. Beck's nationwide recycling market development experience, combined with our presence in California and close working relationship with Board staff ensures we will be responsive to the Board's unique context. Moreover, team members are located throughout the state to facilitate access to all business clients.

Our team structure and qualifications are described below; project descriptions demonstrating our team's broad capabilities are included on page 9 of this section. Following are some highlights of our team's previous experience providing services relevant to the Program:

- **R. W. Beck** has conducted several state level recycling market studies including tires along with other material types. In 2005, we prepared a comprehensive scrap tire market analysis and strategic market development plan for the New York Department of Economic Development.
- **Manager Ed Boisson** co-managed five regional recycling investment forums for multiple clients, including reviewing over 80 recycling manufacturer business plans and facilitating investor critiques of business presentations. The forums were highly successful. In three Northeast Forums alone, 43 firms made presentations before 93 potential investors, with at least 14 firms citing their experience as

instrumental to their securing a combined total of over $20 million in equity capital.

- **The Corporation for Manufacturing Excellence (Manex)**, an affiliate of the federal Manufacturing Extension Partnership, has provided general and technical business assistance services to hundreds of clients since its founding in 1995, including a recent project with Gates Rubber, a Denver-based manufacturer of rubber hoses and belts that focused on enhancing operations through improved quality control and lean manufacturing excellence.
- **AMPros** Principal Dan Hauschild recently prepared a business assessment protocol and applied it in an analysis of numerous recycling businesses for the U.S. Environmental Protection Agency, Region 5. He also prepared a detailed benchmark report documenting average operating statistics for Minnesota recycling businesses.
- **California Manufacturing Technology Consultants (CMTC)**, an affiliate of the federal Manufacturing Extension Partnership, has provided assistance to hundreds of clients since its founding in 1993, including a recent project for Mission Rubber Company in Corona involving technical training on management systems that resulted in a 30 percent increase in productivity.
- **Consultants from the Recycled Tire Engineering and Research Foundation** who will serve on the R. W. Beck team are responsible for pioneering the use of recycled rubber paving products in the State of Arizona over the past two decades.
- **Bottom Line Consulting** has worked with several manufacturing clients to successfully incorporate recycled rubber and plastic into product in the automotive, lawn and garden, and telecommunications industries.

Team Structure

Our team structure is designed to seamlessly interface with Board staff in setting a strategic direction and efficiently deploying specialized expertise to deliver results. The R. W. Beck team understands that the Board is heavily invested in the Program, and we view implementation as a mutual partnership. Our team's experience working with both businesses as well as public clients will help cultivate this partnership.

As presented in the chart on the following page, our team structure has four key components:

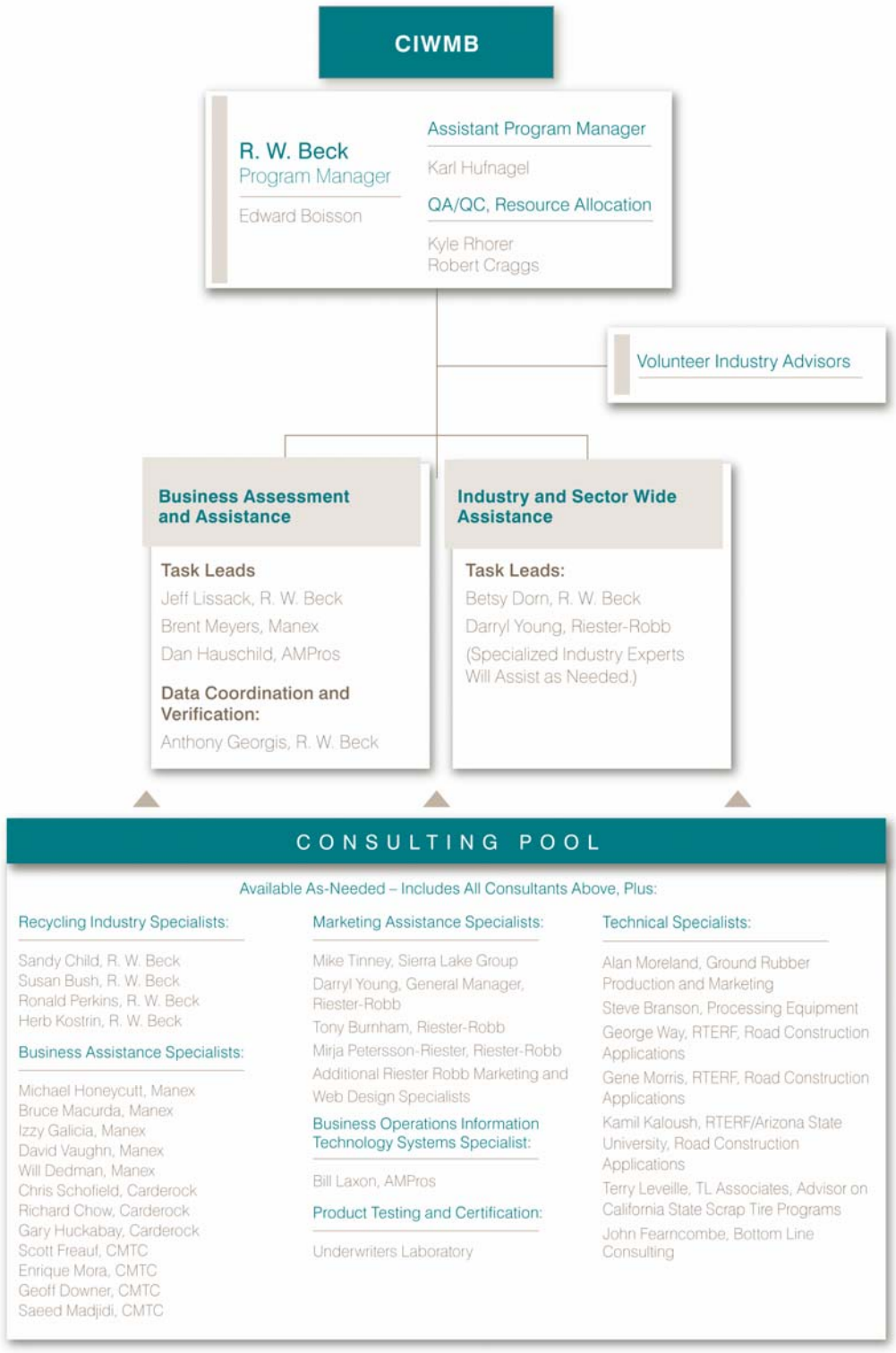
- A ***Management Team*** with overall responsibility for delivering high quality, on-time service, communicating with the Board, and overall program administration;
- ***Task Leads*** responsible for assisting the program manager in strategy development, coordination ,and resource allocation, as well as acting as lead advocate for clients assigned to them or taking the lead on industry/sector wide tasks, including overseeing services provided by other team members as needed;
- A ***Consulting Pool*** providing direct access to a broad range of specialized expertise; and
- ***Volunteer Industry Advisors***, who will be invited to provide niche expertise on business and industry wide tasks, as appropriate.

Our team members are fully committed to working closely with the Board as the Program evolves to further our collective understanding of the California scrap tire recycling industry and our capacities to optimize Program efficiency and effectiveness.

These team components are described in further detail following our team organization chart.

Organization Chart

The chart below illustrates our team structure. Resumes for R. W. Beck and subcontractor team members are included in Appendix B.



Program Management Team

As discussed in Section 2, our program management team has deep experience managing and coordinating complex projects while emphasizing quality assurance and close communication with all parties. The R. W. Beck management team is comprised of:

- **Ed Boisson, program manager,** responsible for overall program management, including Board communications, team/Board staff coordination, allocating and tracking resources, and delivering high quality products and services on time and within budget;
- **Karl Hufnagel, assistant program manager**, responsible for assisting the program manager as needed, especially related to tracking task status, budgets, and reporting;
- **Kyle Rhorer, quality assurance/quality control** and R. W. Beck resource allocation, responsible for reviewing processes, procedures, and select work products to ensure the highest quality, and for ensuring that the full resources of R. W. Beck are available to the program as needed; and
- **Robert Craggs, overall quality assurance/quality control** and R. W. Beck resource allocation, responsible in conjunction with Kyle Rhorer for assuring that Program processes are efficient and complete, and that all needed R. W. Beck resources are identified and available.

Task Leads

With coordination from the management team, two groups of task leads will take primary responsibility for the three main program service areas:

Business Assessment and Assistance Task Leads

Jeffrey Lissack (R. W. Beck), Brent Meyers (Manex), and Dan Hauschild (AMPros) will serve as task leads on business assessment and assistance. They will assist the program manager in refining the assessment process and template, establishing policies and procedures, determining the optimal assignment of team resources regarding assessing, and providing assistance services to businesses. Each will be assigned responsibility for a number of business clients, during both the assessment and assistance Program phases, and will serve as the primary advocate for these assigned clients on behalf of the entire team. The task leads will both provide services themselves as well as overseeing other team members, as appropriate, and in consultation with the management team. These seasoned professionals collectively provide decades of business and recycling industry experience, and are intimately familiar with the goals and resources available to the program.

Industry and Sector Assistance Task Leads

Betsy Dorn (R. W. Beck) and Darryl Young (Riester-Robb) will serve as primary task leads for industry and sector wide assistance services, working closely with program manager Ed Boisson and Board staff on industry and sector wide market development strategy, work order development, and overseeing market development tasks as assigned. Along with program manager Ed Boisson, Ms. Dorn brings deep experience in state market development strategy development to the team, and Director of the California Department of Conservation, Mr. Young managed for many years the state's largest and longest running recycling public education campaign, including campaigns designed to trigger changes by commercial businesses and manufacturers. We envision drawing heavily on the expertise of Alan Moreland, Ph.D. (ground rubber production and markets), John Fearncombe (manufacturing applications involving rubber-plastic blends), George Way (recycled rubber paving and engineering applications) and Mike Tinney (government agency sales) among other consulting pool team members, as needed. We will also tap the services of volunteer industry advisors, as appropriate.

The two small task lead teams described above will provide a high degree of cohesion and concentrated expertise that will ensure all Program tasks are delivered on time with the highest level of professionalism and quality. We envision that the experience and expertise each task lead brings to the Program will be nurtured into a substantial, collective body of knowledge and insight regarding the California scrap tire recycling industry that will serve client firms and the Board increasingly well as the program evolves.

Consulting Pool

The consulting pool provides a broad range of specialized expertise that maximizes the R. W. Beck team's ability to flexibly provide any type of business assistance service, when and where it is needed. Members of the consulting pool will be tapped where appropriate, either to provide needed general business assessment or assistance resources during workload spikes, or to provide specialized niche expertise needed for specific tasks.

Voluntary Industry Advisors

As requested in the RFP, Addendum #3, R. W. Beck proposes to recruit and coordinate input from voluntary industry advisors as appropriate. We envision that industry advisors will assist in analyzing broad market trends, developing, and implementing proposed market development strategies. Additionally, with approval from business owners/management, we envision involving certain industry advisors with niche expertise to assist in assessing and/or providing assistance to some client firms.

R. W. Beck has contacted a number of organizations whose representatives may be invited to serve as volunteer advisors. Though the short time frame since Addendum #3 was posted precluded securing letters of commitment, we generally received favorable responses from these organizations and fully expect that most will be prepared to participate when and if asked, subject to time and resource restrictions.

Subject to discussion with Board staff, the organizations we envision potentially involving include:

- The Rubber Manufacturers Association;
- The U.S. Green Building Council;
- The Rubber Pavements Association (whose sister organization the Recycled Tire Engineering and Research Foundation is a subcontractor to R. W. Beck under this proposal);
- The Tire Industry Association's Tire and Rubber Recycling Advisory Council;
- The Institute of Scrap Recycling Industries, Scrap Tire Processors Chapter; and
- Trade associations representing industries that are determined to be top priority markets in business assessments and other Program tasks.

Team Qualifications

The roles and qualifications of our management team and task leads are presented below.

Ed Boisson, Program Manager

Ed Boisson will serve as program manager, responsible for overseeing and coordinating all tasks (through designated team leads, and with assistance from Assistant Program Manager Karl Hufnagel); submitting reports and maintaining close communications with Board staff; tracking and allocating team resources; and generally ensuring that the team delivers high quality services and products on time. Mr. Boisson will also play a lead role in market analysis and strategy development, and in facilitating meetings with stakeholders.

Mr. Boisson has more than 18 years experience in the private, government, and non-profit sectors within California and throughout the nation. He specializes in environmental industry development, recycling market development, scrap tire management, product stewardship, facilitation, and environmental/economic impact research. Mr. Boisson's recent experience includes the preparation of a five-year scrap tire market analysis and strategic market development plan for the New York Department of Economic Development.

Prior to joining R. W. Beck, Mr. Boisson worked as a Principal of Boisson & Associations (1998 – 2004), where he provided consulting services related to recycling market development, recycling business planning and financing, product stewardship and environmental and economic impact research.

Mr. Boisson's past experience also included working as the executive director of the Northeast Recycling Council (NERC, 1994 – 1998). At NERC, Mr. Boisson managed a coalition of thirteen state environmental agencies dedicated to developing and coordinating recycling industry policies, managed recycling financing initiatives and conducted regional and national research on recycling markets.

Mr. Boisson's past experience also included working at the California Integrated Waste Management Board (1990 – 1994). While employed at the Board, Mr. Boisson served successive periods as manager of the Board's Policy Office, manager of the Recycling Market Development Zone Loan Program, and Recycling Market Analyst.

Karl Hufnagel, Assistant Program Manager

Karl Hufnagel will support Mr. Boisson in managing and coordinating Program tasks, including tracking budgets, preparing report and allocating team resources. Mr. Hufnagel may also provide business or sector wide assistance services related to process design and efficiency, and engineering analyses. Mr. Hufnagel is a civil engineer with more than 35 years of experience specializing in managing large project teams for major recycling and solid waste facility siting, planning, environmental review, design, and construction projects with budgets in excess of $25 million. Mr. Hufnagel is also experienced in defining design criteria, estimating costs, scheduling, and implementing methods to control project budgets. His background includes the technical review of major state-of-the-art facilities throughout the United States.

Kyle Rhorer, QA/QC and Resource Allocation

Kyle Rhorer will provide overall quality assurance and quality control services, reviewing key documents and working closely with Mr. Boisson and Mr. Hufnagel to ensure quality of all services and deliverables under the Program. Mr. Rhorer will also provide assistance and advice related to identifying and allocating resources within R. W. Beck and elsewhere. If needed, Mr. Rhorer is also available to provide business assessment and/or general business assistance services. Mr. Rhorer specializes in the

areas of strategic planning, capital financing, financial management, and controls, and the development of public-private partnerships for utility infrastructure. Mr. Rhorer also has over 16 years of experience in marketing to municipalities, regulatory agencies, solid waste utilities, publicly- and privately-owned drinking water, wastewater, and other environmental services providers.

He provides business consulting services concerning innovative opportunities for clients, including revenue enhancement strategies; capital and operating cost optimization; conventional and alternative service delivery approaches, and other analyses concerning the current and future competitive role within regional solid waste services markets. He also manages performance assessments for both public and private clients to identify potential alternatives to achieve cost reductions while maintaining or improving the current level of service provided.

Robert Craggs, Quality Control/Quality Assurance and Resource Allocation

Along with Kyle Rhorer, Robert Craggs will provide overall quality assurance and quality control services, reviewing key documents and working closely with Mr. Boisson and Mr. Hufnagel to ensure quality of all services and deliverables under the Program.

Mr. Craggs is Vice President of R. W. Beck's Solid Waste Practice. Mr. Craggs specializes in integrated solid waste management and approaching this service with a business planning perspective while assisting local, regional, and state governmental organizations with their solid waste management needs. To promote practical solutions, he has directed several waste characterization studies to establish program baselines. Mr. Craggs has directed several evaluations of local governmental solid waste and recycling programs. These evaluations include review of various services including collection, processing, and disposal. Evaluation components typically include management, financial, and operations reviews; specific program recommendations; and implementation of improvements.

Brent Meyers, Co-Lead, Business Assessment and Assistance

Brent Meyers will act as co-task lead for business assessment and assistance services, working in coordination with Program Manager Ed Boisson and other co-leads to ensure that team assistance resources are allocated in an optimal manner, and assisting in coordinating and overseeing assistance efforts. Mr. Meyers will serve as primary client advocate for select firms, responsible for conducting business assessments and providing business assistance, and/or overseeing other team members as assigned during the Program. Mr. Meyers is President and Chief Executive Officer of Manex. He brings twenty years of leadership and consulting success in developing and cultivating profitable businesses across a number of industries, including manufacturing and distribution, retail, hospitality, technology, and services.

An expert in developing corporate strategies and aligning organizations to achieve breakthrough objectives, Brent has developed several proprietary methodologies to assist clients with improving market-driven performance. These methodologies include Revenue Enhancement, New Product Development, Mergers & Acquisitions, and Customer Satisfaction & Retention.

Prior to joining Manex, Brent was U.S. Managing Partner of Strategic Consulting at Grant Thornton LLP (a $3 billion professional services firm) where he was acting Chief Strategy Officer and a member of the firm's Leadership Committee.

Dan Hauschild, Co-Lead, Business Assessment and Assistance

Dan Hauschild will serve as co-task lead on business assessment and assistance services, working cooperatively with Program Manager Ed Boisson and other co-leads to ensure that team resources are allocated in an optimal manner. Mr. Hauschild will also serve as primary client advocate select businesses, responsible for conducting assessments and providing business assistance services and/or overseeing other team members as assigned. Mr. Hauschild will take the lead in compiling the California Scrap Tire Recycling Industry Benchmark Report, and in preparing confidential, individualized reports for participating businesses. Mr. Hauschild is President and founder of AMPros Corporation, with 22 years applicable business, and 15 years management consulting experience for recycling, manufacturing, and high technology companies. He has a range of experience in business and financial management, plus technical background in materials and process engineering as well as the management of design and production processes. He developed a Business Assessment Protocol and provided Strategic and Operational Business Assistance to numerous businesses in recycling and manufacturing market segments. His Business Assessment Protocol was specifically applied to improving performance at numerous Minnesota recycling companies and adapted to deliver the first of its kind Recycling Industry Benchmarking and Financial Performance report in January 2005. Mr. Hauschild has also trained executive management in strategic planning, provided team leadership in quality improvement processes and developed innovative techniques for integrating Activity Based Costing (ABC) with Total Quality Management.

Jeffrey Lissack, Co-Lead, Business Assessment and Assistance

Jeffrey Lissack will act as co-task lead for business assessment and assistance services, working in coordination with Program Manager Ed Boisson and other co-leads to ensure that team assistance resources are allocated in an optimal manner, and assisting in coordinating and overseeing assistance efforts. Mr. Lissack will serve as primary client advocate for select firms, responsible for conducting business assessments and providing business assistance, and/or overseeing other team members as assigned during the Program. Mr. Lissack will also assist as needed with industry-wide market development efforts.

Mr. Lissack has served as a contract employee of R. W. Beck since September, 2005. Mr. Lissack brings more than 20 years of consulting, small business management, and recycling market development experience to bear on this program. Mr. Lissack's small business consulting experience includes helping to raise start-up and expansion capital; sourcing, structuring, and negotiating business development transactions; and conducting strategy, product development, and marketing planning. Mr. Lissack has worked as a business development and operations executive for three early stage technology companies, managing teams of one to sixty-five in roles including chief operating officer, business development, marketing, product management, and customer service. Mr. Lissack played a critical role for one of these firms in growing annual sales from $1M to $40M and taking it public. Mr. Lissack's recycling market development experience includes seven years as the Director of Recycling Market Development for the state of MA, where his accomplishments included creation of a multi-million dollar loan fund to aid recycling businesses and of a program that boosted state purchases of recycled products from <$3M to >$27M annually. In his role as Chair of the Northeast Recycling Council, Mr. Lissack worked with Ed Boisson to develop a series of investment forums providing assistance to dozens of recycling-related businesses and to design and conduct a multi-state study documenting recycling industry performance statistics.

Betsy Dorn, Co-Lead, Industry and Sector Wide Assistance

Betsy Dorn will serve as co-task lead for industry and sector wide assistance efforts, providing analysis and strategic planning services related to analyzing and developing industry or sector wide market development strategies, and evaluating opportunities for cooperative marketing in conjunction with business assistance efforts. Ms. Dorn will also lead select market development tasks as assigned, overseeing and coordinating the work of other team members. Ms. Dorn has 20 years of solid waste and market development experience and is recognized as a leading expert on recycling market development. She provides public and private sector clients with strategic planning, supply/demand analyses, materials sourcing, funding and economic analyses, public outreach, and other related services. She also provides consultant services related to plan development, operational evaluations, launching new programs, developing new or expanded markets, and training solid waste and recycling professionals.

Most recently, Ms. Dorn served as project manager on the New York Scrap Tire Market Assessment and Strategic Business Plan and has been working with the Commonwealth of Pennsylvania Department of Environmental Protection on the development and implementation of a Statewide Recycling Market Development Center. Ms. Dorn has played a similar role in strategic planning for recycling market development of Massachusetts, Texas, and North Carolina.

Darryl Young, Co-Lead Industry and Sector Wide Assistance

Darryl Young will serve as co-task lead for industry and sector wide assistance efforts, providing analysis and strategic planning services related to analyzing and developing industry or sector wide market development strategies, and evaluating opportunities for cooperative marketing in conjunction with business assistance efforts. Mr. Young will also lead select market development tasks as assigned, overseeing and coordinating the work of other team members. Mr. Young is a national speaker on recycling, the environmental movement, and environmental politics. His experience includes assisting clients in transforming markets, business practices, and policy to create economic incentives that yield positive environmental and economic outcomes. Mr. Young has served as a Director at the California Department of Conservation where he directed a successful effort to increase visibility of department programs through coordinated public outreach and media strategies, and established award winning social marketing campaigns that are nationally recognized and duplicated.

Alan Moreland, Industry Specialist

Alan Moreland will provide assistance related to ground rubber production and markets, in connection both with business assistance efforts and with industry or sector wide efforts. Alan Moreland, Ph.D. is an independent ground rubber broker and a consultant specializing in ground rubber production systems and tire-derived product markets. Mr. Moreland's expertise covers the full range of ground rubber, from coarse to ultra-fine, and the many products made from it. Mr. Moreland has over 35 years experience in the rubber and rubber recycling industry, and recently served for two years as Chairman of the American Chemical Society, Rubber Division's Rubber Recycling Topical Group. Mr. Moreland's career has centered on the technical and marketing aspects of the rubber industry and rubber recycling industries. In addition to a sound technical grounding, he has broad experience in manufacturing quality systems, sales, marketing and product development, especially in the rubber recycling area. For the past two years, Mr. Moreland has provided consulting services to several rubber recycling firms located throughout North America, has pursued market expansion opportunities with several customers and has provided ground rubber brokerage services.

Relevant Project Experience

The following list of projects have been included to provide an overview of our team's qualifications and experience with projects of similar purpose and scope.

R. W. Beck

Comprehensive Scrap tire Market Assessment and Strategic Plan

New York State Department of Economic Development, New York

Key Services

- Provided recommendations on how to overcome technical, financial, regulatory, and perceptual barriers affecting the marketplace
- Prepared a five-year strategic market development plan

The State of New York Department of Economic Development (DED) has been directed by State Legislature to conduct an analysis of the disposition and markets for both stockpiled and annually generated tires originating in New York, to assist with private market development, and promote the use of recycled tire products. R. W. Beck was retained to:

- Characterize and quantify New York scrap tire supply and demand;
- Analyze the current scrap tire markets and market trends impacting New York State;
- Identify untapped and underutilized markets;
- Evaluate various options for building New York State capacity to make beneficial use of scrap tires with an emphasis on higher value added end markets; and
- Prepare a five year strategic tire recycling market development plan.

The focus of the analysis was to identify the technical, financial, institutional, regulatory, and perceptual barriers affecting scrap tire use and to develop recommendations on how the State can overcome these barriers and build market capacity as well as address new market inefficiencies as they appear over time. The R. W. Beck team interviewed more than 40 representatives involved in supplying, processing, and/or making use of scrap tires, and conducted three stakeholder forums to gather information on key barriers and opportunities and to ensure the project findings and recommendations reflected the unique needs and circumstances present in New York. A detailed strategic plan was developed that included principles of approach and specific action strategies for realizing priority scrap tire recycling market expansion and development opportunities.

The results of this project will guide the DED in building stable and diversified markets for scrap tires, with an emphasis on higher value added end markets.

Recycling Market Center Study

Pennsylvania Department of Environmental Protection

R. W. Beck is assisting the Pennsylvania Department of Environmental Protection with the research and planning work needed to establish a recycling market development center and program to expand and enhance the marketplace for recyclable materials generated in the Commonwealth. Work on this assignment is being performed in three phases. In Phase 1, R. W. Beck:

Key Services

- Market Supply/Demand Analysis
- Market Barrier & Inefficiency Analysis
- Market Opportunity Analysis
- Strategic Plan Development
- Recycling Market Center Business Plan Development
- Recycling Market Development Implementation Assistance

- Assessed the supply and demand for recyclable materials generated in Pennsylvania;
- Facilitated a one-day stakeholders forum to identify recycling market strengths, weaknesses, and market development barriers and opportunities; and
- Evaluated the institutional capacity in the state to perform recycling market development work.

In Phase 2, the Beck Project Team:

- Reviewed existing and proposed Department initiatives and provided recommendations on means to expand and enhance the recycling market development effort;
- Evaluated recycling market development strategy mechanisms, including employment of a full-time business consultant, utilization of an existing non-pro
- fit organization, or the utilization of a college or university to operate the Center; and
- Developed a business plan that included a description of recommended market development methods, techniques, and the organizational structure to implement and sustain a market development center overseen by the Commonwealth.

In Phase 3, R. W. Beck assisted the Department in reviewing proposals and selecting an organization to establish and operate the Recycling Markets Center (RMC).

R. W. Beck has continued to assist the Department with establishing the RMC, and is currently involved in aiding the Center in conducting specific work activities to address recycling market development priorities.

Tire Recycling Study

PRIDE of Florida, Inc. /Tallahassee, Florida

R. W. Beck conducted a Prison Rehabilitative Industries and Diversified Enterprises, Inc., (PRIDE) to conduct a feasibility study. PRIDE was organized in December 1981 by the State of Florida as a private, non-profit corporation, and authorized to operate industries employing inmates from Florida correctional institutions.

Key Services

- Projected waste tire supplies
- Evaluated markets
- Developed conceptual designs
- Performed a technical and economic feasibility analysis
- Developed a business plan based on the analysis of the waste tire market

The study evaluated the feasibility of constructing tire processing facilities at correctional facilities throughout the State of Florida. These tire processing facilities would recycle waste tires into marketable products.

As part of this study, R. W. Beck projected waste tire supplies, evaluated markets, developed conceptual designs for collection and processing centers, and performed a technical and economic feasibility analysis of the proposed project.

R. W. Beck also developed a business plan for the tire processing facilities based on the analysis of the waste tire market and available tire processing technologies.

Independent Engineer's Report Prepared For Issuance of Long-Term Financing

Mellon Bank/American TYPLAX Systems

American TYPLAX Systems, Inc., has proposed to build the first commercial facility to produce TYPLAX from discarded tires. TYPLAX is a combination of rubber and plastic which is intended to be used as a plastic resin. R. W. Beck completed an Independent Engineer's Report on this project for Mellon Bank. Our review included consideration of the soundness of the proposed technology; the quantity of tires in the service area; an analysis of the potential market for the main product and by-products; a review of the reasonableness of the projected operating and maintenance expenses; and a review of the construction and licensing agreements.

Key Services

- Generation Estimates
- Technology Review/Testing
- Funding Options
- Market Development
- Market Capacity Verification
- Environmental Assessments

Comprehensive Waste Tire Recycling Study

New Hampshire Department of Environmental Services

R. W. Beck conducted a two-stage study which first addressed the issues linked to the remediation of the State's largest known tire pile. The study also evaluated the recycling-disposal options available for the daily generation of tires.

In Phase 1, R. W. Beck assessed the environmental and fire hazards stemming from the Hunt Tire Pile located in Danville, New Hampshire. R. W. Beck prepared a strategy for implementing remedial actions and for final removal of the stockpiled tires. In preparing this strategy, the firm mapped the pile, estimated the quantity of tires, defined locations having the greatest potential for environmental impact and evaluated methods for minimizing risk related to community health and safety in the interim period prior to clean-up.

Key Services

- Generation Estimates
- Technology Review/Testing
- Operations/Maintenance
- Life Cycle Evaluation
- Commodity Price Analysis
- Funding Options

R. W. Beck prepared a Request for Remedial Action for the State and subsequently assisted in the evaluation of responses. The team also provided continued services for monitoring the progress of clean-up activities performed at the site.

In Phase 2, R. W. Beck developed a statewide scrap tire recycling and disposal program. An evaluation of scrap tire generation, transport methods, markets, economics, and a variety of scrap tire recycling technologies were performed. The study resulted in a plan for government intervention in scrap tire collection and disposal activities. R. W. Beck worked with the State of New Hampshire to procure scrap tire processing capacity which would provide a tire disposal option for the State's daily generation of tires. The team researched: ongoing tire generation rates, appropriate management technologies,

markets, and the economic viability of various management options. R. W. Beck prepared procurement documents for the State to address the management of annually generated scrap tires.

Plastics Quality and Cost Optimization Project

New York State Department of Economic Development

R. W. Beck assisted the State of New York with a project to: establish a more cost-effective post-consumer plastics reclamation infrastructure in New York State by identifying gaps and deficiencies in the State's collection, processing, and to expand the base of manufacturers using post-consumer plastic resin (PCR) as a feedstock material.

Key Services

- Generation Estimates
- Market Opportunity Analysis
- Strategic Planning
- Program Evaluation
- Economic Impact Analysis

The project included field visits to various communities to observe and document deficiencies in the existing recycling infrastructure with subsequent follow-up visits to implement changes anticipated to improve the State's recycling infrastructure. The project identified companies willing and able to optimize quality and costs in collecting, processing, and using PCR. Tailored implementation plans were then drafted for each company. Finally, technical assistance to each company that chose to actually implement its plan.

Recyclable Materials Market Study and Plan

Intergovernmental Solid Waste Authority, Champaign/Urbana, Illinois

R. W. Beck completed a material-specific recycling analysis for the Intergovernmental Solid Waste Authority in the Cities of Champaign and Urbana, Illinois.

Key Services

- Generation Estimates
- Collection System Planning
- Market Capacity Verification
- Commodity Price Analysis
- Funding Options
- Market Development

One focus of this work was a waste tire market study. The Intergovernmental Solid Waste Authority wanted to divert all waste tires away from traditional disposal methods and toward recovery strategies. The R. W. Beck team identified recovery options for waste tires and determined the economics of each strategy.

R. W. Beck also completed an investigation of the potential for waste plastic recycling in the region. Additionally, the project team explored options for increasing recovery of commercial waste and waste generated by the University of Illinois.

Recycled Plastics Market Database

American Plastics Council/Arlington, Virginia

Twice each year since 1990, R. W. Beck has been retained by the American Plastics Council to develop and update a comprehensive database of companies that recycle plastics. The purpose of the database is to document changes in the plastics recycling infrastructure and serve as a tool to link buyers and sellers of plastics. The database also provides current information to APC Government Affairs staff working on technical issues at the state and federal levels.

Companies in the database include those handling (sorting/baling), reclaiming (washing/pelletizing), brokering, and exporting plastics. Examples of information contained in the database include the types and quantities of plastics processed, the types of processing performed and equipment used, and the number of employees at each facility location.

Key Services

- Market Development Institutional Development
- Strategic Planning
- Program Evaluation
- Database Development/Modeling
- Economic Impact Analysis

From the project's inception until 2000, the survey was conducted via a mail out, with follow-up phone calls to those who didn't respond to the mail survey. In 2001, the process was streamlined through the use of email and the Internet. This process saved postage and paper for 4026 surveys.

This database has documented the growth in the U.S. plastics recycling infrastructure - from 117 plastic recyclers in 1981 to 2,115 in 1999. Of the companies included in the database in 1999, 1,399 were handlers (sort/bale only) while 393 were found to be reclaimers preparing post-consumer plastic for reuse. An additional 120 brokers and exporters are included in the database. The study also quantified nearly 62,000 employees working within the plastics recycling industry.

Recycling Market Development Study

Arizona Department of Commerce

R. W. Beck was retained by the Arizona Department of Commerce (ADOC) to perform the Arizona Recycling Market Development Study. This study analyzed Arizona's recycling activities among communities, collectors, processors, brokers, and end-users. The purpose of the study included the following four objectives:

- Development of primary research into the State's recycling activities among the entities mentioned above;
- Identification of present and future business opportunities and economic impacts of the recycling industry in Arizona;
- Provision of a Statewide directory and survey of recycling collectors, processors, and end-users that can be used by public, private, and non-profit organizations;
- Presentation of recommendations to the ADOC and the Arizona Department of Environmental Quality on ways to further promote recycling market development in Arizona.

Key Services

- Market Supply/Demand Analysis
- Market Barrier & Inefficiency Analysis
- Market Development Institutional Development
- Database Development/Modeling
- Solicit Stakeholder Input

The study resulted in a variety of tools that can be used by the State in encouraging capital investment and job creation in the recycling industry. An interactive database, which includes communities, processors, and end-users in Arizona, was created. This database serves as a useful tool for the research of supply and service opportunities within the State. In addition, data collected from the research portion of the study was compiled in a recycling resource directory, which lists statewide recycling industry contacts, as well as community recyclable tonnages and collection information. The collected data was further analyzed and summarized in a Recycling Market Prospectus, which outlines specific recycling business opportunities within Arizona.

Multi-Stakeholder Recovery Project

Businesses and Environmentalists Allied for Recycling (BEAR)

The Multi-Stakeholder Recovery Project (MSRP) was a high profile, national project intended to promote national, voluntary initiatives to boost the national beverage container recycling rate. The project was launched in spring 2001 by Businesses and Environmentalists Allied for Recycling (BEAR), a project of Global Green USA. Boisson & Associates was retained to manage the project and facilitate a dialog among beverage and recycling industry companies, public agencies, and environmental advocacy organizations. R. W. Beck was retained as the prime consultant for all aspects of project research.

Key Services

- Generation Estimates
- Market Supply/Demand Analysis
- Market Barrier & Inefficiency Analysis
- Recycling Market Development Facilitation
- Solicit Stakeholder Input
- Public Education/Program Promotion

The project had two key goals. The first goal was to secure agreement by major stakeholders on the market trends, benefits, costs and effectiveness of alternative beverage container recycling programs. R. W. Beck led the preparation of a “value chain” analysis documenting recycling market trends and the costs, benefits and effectiveness of alternative beverage container recycling programs, including:

- Deposit and Redemption Programs;
- Curbside Recycling Programs;
- Drop-Off Recycling Programs; and
- Other Non-Residential Recycling Programs.

For each program, R. W. Beck and its subconsultants performed a detailed economic analysis to provide an understanding of the costs and revenues at each stage of the collection and processing system. R. W. Beck used a "Systems Thinking" approach as a means to analyze existing and alternative PET, aluminum, and glass beverage container recovery methods for maximizing recovery. “Systems Thinking” facilitates broad-based stakeholder support that is consistent with the initiative taken by BEAR to form the Multi-Stakeholder Recovery Project (MSRP) Task Force. Through a sensitive and sometimes contentious stakeholder dialog facilitated by Edward Boisson, this project goal was achieved, with the project’s final report ultimately endorsed by the entire multi-stakeholder task force.

The second project goal was to use the value chain analysis as a basis for reaching agreement on a national, voluntary initiative that could achieve over time an 80 percent beverage container recycling rate. The Project Team lead by Edward Boisson and R. W. Beck analyzed how existing recovery programs could be optimized or adjusted to best satisfy the MSRP’s guiding principles. Although substantial progress was made towards developing new, innovative recovery programs that could serve as the foundation for a national, voluntary multi-stakeholder initiative, the goal of securing multi-stakeholder agreement and commitments to launch such an initiative was not achieved.

Recycled PET-End Use Study

NAPCOR/ Charlotte, North Carolina

Since 1998, the National Association for PET Container Resources (NAPCOR) has retained R. W. Beck to perform a Recycled PET End-Use Study, which includes quantifying the annual amount of post-consumer recycled PET resin utilized in various end-market applications. NAPCOR's member organizations have found the data to be valuable in order to understand the supply and demand for recycled PET and invest appropriate industry resources to further expand the utilization of recycled PET in end-market applications.

Key Services

- Market Opportunity Analysis
- Program Evaluation
- Solicit Stakeholder Input
- Database Development/Modeling
- Economic Impact Analysis

The scope of this project includes the development of a detailed contact list of potential post-consumer PET end-users (including fiber manufacturers, sheet producers, etc.), conducting a survey of the companies included on the contact list, developing a database to house the data, and developing a project report to summarize the findings of the study.

Select Project Experience for Ed Boisson, Program Manager (prior to R. W. Beck)

Regional Recycling Investment Forums

Various Clients/United States

As Executive Director of the Northeast Recycling Council, and as Principal of Boisson & Associates, Mr. Boisson co-managed and provided technical assistance to three annual Northeast Recycling Investment Forums (held between 1996 and 1998), the Midwest Recycling Investment Forum (held in September, 1999), and the Southwest Recycling Investment Forum (held in August 1999). Mr. Boisson's role included:

- Recruiting and coordinating investment organizations as partners;
- Recruiting and screening prospective recycling business participants;
- Organizing and facilitating training sessions for selected recycling businesses seeking equity financing; and
- Overseeing the logistics of promoting and conducting the events.

During these events, Mr. Boisson reviewed and critiqued the business plans of more than 80 recycling manufacturers. The Forums were highly successful. In the Northeast Forums alone, 43 firms made presentations before 93 potential investors, with at least 14 firms citing their experience as instrumental to their securing a combined total of over $20 million in equity capital. Clients included the Northeast Recycling Council, Mid-America Council of Recycling Officials, and the Southwest Public Recycling Associations.

Evaluation of Feedstock Conversion Opportunities in Massachusetts

Chelsea Center for Recycling Economic Development/Chelsea, Massachusetts

As Principal of Boisson & Associates, Edward Boisson designed and conducted an evaluation of opportunities to encourage Massachusetts manufacturers to use recycled materials as raw material feedstock. Six criteria were established for use in prioritizing opportunities:

- Is conversion to recycled feedstock likely to be customer driven?
- Will recycled feedstock improve production economics?
- Are proven technologies available?
- Is there a proven supply infrastructure?
- Are candidate firms likely to be committed to investigating conversion to recycled feedstock?
- Is a feedstock conversion program likely to yield significant, positive results?

The project investigated ten separate feedstock conversion opportunities, including use of scrap tire shreds and chips in civil engineering projects, use of ground rubber in asphalt products, and use of ground rubber in molded products. In Phase 2 of the project, Mr. Boisson implemented a feedstock conversion program targeting use of recycled textiles by shoddy (a cotton insulation material) manufacturers in Massachusetts.

Recycling Industry Economic Information Research

Northeast Recycling Council and the US Environmental Protection Agency/Brattleboro, Vermont

As Executive Director of the Northeast Recycling Council, Mr. Boisson conceived, designed and managed several projects to document and promote investment opportunities in the recycling industry, including:

- The Recycling Economic Information Study Final Report included a summary of all available sources of information on recycling industry firms, a recommended categorization scheme for the industry, and a recommended methodology for documenting basic industry statistics. The recommended methodology was subsequently implemented by R. W. Beck, on behalf of the Northeast Recycling Council, the National Recycling Coalition and several states, yielding the first ever estimates of national recycling industry size.
- The Recycling Industry Financing Seminars program provided training to recycling firms in seeking investments. Partners included the Wharton School of Business.
- The Library of Recycling Industry Financial Transactions documented a number of investments in recycling firms and compiled select industry performance data.
- The Fostering Economic Development through Recycling project included development and deployment of a training curriculum for local economic developers to promote recycling industry opportunities.

Additional Team Experience

Corporation for Manufacturing Excellence (Manex)

Gates Rubber Business Planning

Gates/Denver, Colorado

Founded in 1911, Denver-based Gates had 10 hose and belt plants in the United States, two in Canada, and three in Mexico, as well as another 15 facilities around the world.

Markets served by Gates include the industrial and automotive original equipment and replacement markets, agriculture, transportation, mining, forestry, construction, office equipment, computer, and the food processing and handling markets.

Key Services

- Provided a comprehensive external business assessments of the business operations of recycling companies in eight states

The overall objective of the Gates project was to enhance the operating systems and business position by focusing on key principles of quality systems and lean manufacturing excellence. Manex produced the following deliverables:

- Assessment of the current level of lean implementation in the organization using a Lean Level Assessment
- Organization culture and systems assessment using surveys, interviews and shadowing of selected representative team members at all levels and in all functions of the organization
- Current State Mapping of the material and information flow of the plant and / or process level for a mutually agreed upon process
- Current State Mapping of the administrative support systems using a policy deployment flowchart method and mutually agreed on process(s)
- Time studies and data collection of plant floor operational processes to identify constraints and waste utilizing Production Capacity Charts, Standardized Work Charts, Standardized Work Combination Tables and Work Balance Charts
- Reviews of systems and processes using check sheets in the areas of Maintenance, Production Control, 5S, Quality, Operations, and Error-Proofing
- Work with a select group of plant personnel in the preparation and evaluation
- Value Stream Mapping from a lean perspective so they can understand the process
- Prepare a PowerPoint presentation for Gates Rubber that details the current state of lean implementation and identifies future opportunities, constraints / potential barriers and required activities to drive improvement and move forward in implementation at the operational, tactical and organizational levels
- Development and execution of enhanced operating system and Lean Manufacturing excellence over a 12 month period across multiple facilities

AMPros Corporation

Business Assessment

Wyoming Machine, Inc./Stacy, Minnesota

Wyoming Machine, Inc.(WMI) a sheet metal fabrication company that first undertook a Business Assessment in 1999 followed up on the recommended business assistance critical success factors actions. AMPros provided a comprehensive operational analysis and strategic plan development followed by process and material flow improvement via more efficient plant layout. Information system requirements definition, selection and implementation followed analysis and restructuring of processes. AMPros also determined product and customer profitability drove product re-pricing as well as re-alignment of overhead costs and rates. AMPros also assisted WMI in preparation for and attainment of ISO 9000:2000 certification. Overall productivity increased nearly 50 percent and profitability by 300 percent over the past five years. The company is now in the next iteration of its strategic plan.

Business Assessment

Minnesota Office of Environmental Assistance, Minnesota

Minnesota Office of Environmental Assistance (MOEA; now part of Pollution Control Agency) retained AMPros to apply the Business Assessment Protocol specifically to Minnesota recycling companies. Companies participated in the assessment process and received individual 50 to 75 page report detailing critical success factors and recommended actions. Several companies requested subsequent business assistance. AMPros under funding from the US-EPA and MOEA sponsorship, adapted its Business Assessment Protocol to conduct a first of its kind Recycling Industry Benchmarking and Financial Performance project. Businesses from eight states were invited to participate in the project.

Business Assessment

Asset Recovery Corporation/St. Paul, Minnesota

Asset Recovery Corporation is an electronics recycling company based in Minnesota that requested a business assessment. AMPros performed a review of existing business plans, strategic materials, marketing materials, financial statements, quality assurance plans, and improvement activity documents and prepared market and business growth strategies. Several opportunities and critical success factors were identified. Subsequent business assistance focused on customer and product profitability, and realignment of processes with business goals resulting in substantial growth in both revenue and profit.

Key Services

- Identified market opportunities
- Assessment focused on goals, customer and product profitability, and the realignment of processes with business goals

Riester-Robb Pacific, Inc.

"It's Good for The Bottle, It's Good for the Can" Recycling Campaign

California Department of Conservation, Division of Recycling, California

To support the new public outreach campaign, Riester~Robb and the California Department of Conservation staff planned and deployed a comprehensive media campaign to motivate Californians to recycle more. The trashed aluminum, glass, and plastic represented an estimated $158 million in unredeemed CRV deposits.

After Riester~Robb conducted focus groups throughout California, a series of intercept interviews and a statewide telephone survey, the firm gained significant insight into consumer recycling behavior. Television and radio reporters were the primary focus of the initial media pitch. Statewide print, wire services and trade publications were involved in final pre-event pitching and same-day pitching.

Key Services

- Coordinated a media campaign to promote recycling within the State of California
- As a result of the campaign, the public's intention to recycle increased dramatically 19 percentage points to 80 percent leading to an increased recycling rate throughout the state of California

Secondary media outreach was conducted to ensure coverage in trade publications such as Recycling Today, and RecycleScene. At the annual California Resource Recovery Association, the trade organization comprised mostly of local municipal recycling program administrators, the Riester~Robb public relations team led seminars to teach local recycling programs "How to Cut through the Media Clutter

In July, the Riester team worked with local Bay Area recycling programs to declare July 25 "Bay Area Bottle and Can Recycling Day." Uniform proclamations were drafted and distributed throughout the region. Local newspapers and media outlets were contacted about the regional coalition formed behind the key concept of beverage container recycling. The California Department of Conservation's public outreach launch was carried on radio and television in the four primary markets that hosted the media events. Local newspapers of record also covered the story. Coverage was tracked in both ethnic and mainstream media.

The campaign resulted in people's intention to recycle increased dramatically 19 percentage points to 80 percent leading to an increased recycling rate throughout the state of California. This is particularly impressive in view of the amazing proliferation of new containers that have been introduced into the California market over the past year, demanding a clearer and more strategically correct educational message.

The Carderock Group

Business Planning Services

Invensys Goodwatts/Richmond, Virginia

Both Principals (Richard Chow and Chris Schofield) worked with Invensys, an energy technology and services company focused on conservation, on general business planning services. Carderock advised and assisted the Management team with the company's general strategy, business model refinement, and long term financial planning. In addition, Carderock helped with the response to an energy conservation RFP issued by a publicly owned utility. The assignment ended when the RFP was submitted and the business plan was developed to the degree that allowed Management to pursue funding options.

Sierra Lake Group

Recycled Market Development Zones Business Assistance

California Integrated Waste Management Board/California

Mike Tinney, senior partner of the Sierra Lake Group and Tinney Associates he contracted with the Recycled Market Development Zones (RMDZ) program. The RMDZ program combines recycling with economic development to fuel new businesses, expand existing ones, create jobs, and divert waste from landfills

Mr. Tinney provided business assistance to RMDZ financed companies that needed business planning, marketing, and sales assistance. These companies included SafePath Products and 3D Traffic Works, both companies producing products from recycled California tires.

The project included the development of a marketing plan for product presentation and acceptance by the State of California through the Department of General Services.

Underwriters Laboratory

Certification of Tire Derived Roof Covering Materials

Engineered Rubber Products/Northbrook Illinois

Underwriters Laboratory (UL) provided developmental testing to refine formulations for roof covering materials derived from recycled tire rubber and recycled plastics. UL went on to test the products for compliance to the relevant building code standards. UL has provided continuous certification of the products and has provided follow-up services to verify performance for four years.

Consulting Project

GE Invision/Newark California

The focus of this project was two-fold. The first portion of the project was to educate key personnel on the various global green initiatives, including European Directives on Packaging Waste, WEEE, and RoHS; China WEEE and RoHS; California Proposition 65 and other US-based legislation; and Central/South American proposals in this arena.

The second portion and majority of the project was focused on assisting the core GE team in developing a RoHS compliance plan for their products. As the facilitator, UL's role was to lead discussions on the various aspects of compliance (i.e., what groups within the company are involved, marking requirements, documentation, supply chain management, and testing). At the conclusion of the project, GE was provided with a "roadmap" containing the steps necessary to reach product compliance. GE is currently engaging UL in additional consulting business, as well as testing services, based on their satisfaction with the initial project.

Testing of Plastic Composite Pallets

3M/Northbrook Illinois

This project involved the development of a new fire test for idle pallets stored on racks and protected using control mode sprinklers. UL staff, after reviewing the code requirements, developed a test program to enable storage of idle pallets on racks. The customer will continue their work at UL with non-destructive testing as well as fire and structural performance tests.

Innovative Distribution & Manufacturing LLC (IDM)

Tire Chipping System

En-Tech Inc./White Pigeon, Michigan

En-Tech contracted with IDM to custom build a large tire shredder. The shredder was completed and installed in August of 2002. Additionally, En-Tech has retained IDM to provide subsequent consulting services and tire equipment customization to meet general design, drafting, and mechanical oversight.

Crumb Rubber Plant

Buckeye Tire/Youngstown, Ohio

Buckey Tire purchased a non-operational crumb rubber plant. IDM was contracted to complete the installation, train all employees, set up general practices, and manage the facility. The system consisted of several brands and types of tire recycling equipment, some of the equipment was usable and some was not. The system was made capable of producing mid-range sizes of crumb rubber. The system was in the process of being reworked to produce ultra-fine products when the project was terminated due to corporate issues at another location.

Crumb Rubber Production

Fennell Recycling/Elmira, New York

IDM provided consultation to assist Fennell Recycling begin crumb rubber production. IDM has additionally been retained to evaluate the addition of used tire shredders to their company.

California Manufacturing Technology Consulting (CMTC)

Mission Rubber Case Study

Mission Rubber Company/Corona, California

Mission Rubber Company has fully embraced the Lean Manufacturing philosophies, and their top-level management team had already been trained by CMTC in the various building blocks of the Lean Enterprise. They wanted to start the implementation by introducing 5S concepts (Workplace organization and standardization – Sort, Set in Place, Shine, Standardize, and Sustain) at all levels of management, and to demonstrate its impact through implementation on a pilot basis in their Adjustable Repair Coupling (ARC) Cell. Mission Rubber Company engaged CMTC in April 2002 to start on a series of workshops that included 1) A 5S Workshop for their mid-level management team, a 5S workshop for ARC Cell Shop personnel, 2) A Lean Workshop (training in identifying and eliminating inefficiencies) for the No-Hub Shop personnel, and 3) implementation project involving facilitating deploying 5S in the ARC Cell.

Key personnel in Management and all of the pilot cell employees received classroom training in recognizing the need for 5S, conducting audits, taking corrective actions and creating policies to sustain the effort. This was followed with hands-on training through active participation in implementing the 5S concepts in the ARC cell. Other areas of the plant witnessed the positive impact on employee morale and productivity and on their own initiative embraced the concept by implementing 5S and other Lean techniques.

Mission Rubber Company realized a cost savings of $60,000 from a 30 percent increase in productivity (in the ARC cell) and a one-time savings of $30,000 in contribution margin from additional sales of $200,000. Plans are underway to add a third shift due to increase in demand (resulting from shorter lead times) and to hire 5 additional operators by July 2003.

California Integrated Waste Management Board
Tire-Derived Product Business Assistance Program
Contract #IWM05030

SECTION 6
References

JANUARY 2006

R·W·BECK

SECTION 6

REFERENCES

R. W. Beck and our proposed subcontractors have a record of providing responsive and tailored services to our clients. We encourage you to contact the following client references to verify our capabilities and the quality of our work. This section includes references for R. W. Beck and all proposed subcontractors.

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: R.W. Beck, Inc.

REFERENCE 1

Name of Firm: California Integrated Waste Management Board

Street Address	City	State	Zip Code
1001 I Street	Sacramento	CA	95814

Contact Person	Telephone Number
Shirley Willd-Wagner	916-341-6451
Dates of Service: August, 2005 - Present	Cost of Service: $49,000

Brief Description of Service Provided: Developed cost reporting forms and guidance document for approved collectors and recyclers participating in the Board's electronics recycling program under the Waste Electronics Recycling Act.

REFERENCE 2

Name of Firm: New York State Department of Economic Development

Street Address:	City	State	Zip Code
400 Andrews Street, Suite 710	Rochester	NY	14614

Contact Person	Telephone Number
Jim Gilbert	585-325-1944 ext. 299
Dates of Service September 2004 - Present	Cost of Service $307,000

Brief Description of Service Provided
Prepared a comprehensive scrap tire market analysis, including quantification of flows, and a strategic plan for scrap tire recycling market development. Currently preparing the first of five annual updates. (Mr. Gilbert is also knowledgeable of R. W. Beck's Plastics Quality and Optimization Project, conducted for NY DED. This project included working with NY plastic manufacturers to promote use of recycled feedstocks.)

REFERENCE 3

Name of Firm: Pennsylvania Department of Environmental Protection, Bureau of Land Recycling and Waste Management, Division of Waste Minimization and Planning

Street Address	City	State	Zip Code
400 Market Street, 14th Floor	Harrisburg	PA	17105

Contact Person	Telephone Number
Larry Holley,	717-787-7382
Dates of Service May 2001 - Present	Cost of Service More than $1 million total

Brief Description of Service Provided
Conducted a statewide waste characterization study; analyzed supply and demand for multiple recyclable material commodities; identified recycling market development barriers and opportunities through stakeholder forums and independent research; performed an institutional capacity analysis with respect to recycling market development; developed statewide strategic plan for recycling market development; prepared a business plan for establishing the recently-formed PA Recycling Markets Center (RMC); providing ongoing recycling market development assistance to PA DEP and the RMC.

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: The Corporation for Manufacturing Excellence (Manex)

REFERENCE 1

Name of Firm: Rabit Semi Conductor

Street Address	City	State	Zip Code
2900 Spafford St	Davis	CA	95616

Contact Person	Telephone Number
Jesus Vargas CEO	916-712-6145
Dates of Service	**Cost of Service**
December 2004 – December 2005	$80,000

Brief Description of Service Provided
Implementation of Lean Manufacturing methodologies from Hoshin Strategic Planning to Kaizen Implementation

REFERENCE 2

Name of Firm Del Monte Foods

Street Address	City	State	Zip Code
1 Market Plz, Suite 600	San Francisco	CA	94055

Contact Person	Telephone Number
Scott Butler, Vice President of Engineering	925-944-7277
Dates of Service	**Cost of Service**
March 2005- Present	$250,000

Brief Description of Service Provided
Corporate Strategy and Business Planning.

REFERENCE 3

Name of Firm Production Technologies

Street Address	City	State	Zip Code
17350 Commerce Way	Tracy	CA	95377

Contact Person	Telephone Number
Carl Banks, CEO	209-814-5725
Dates of Service	**Cost of Service**
2002 - 2003	Confidential

Brief Description of Service Provided
Manex Implemented the Lean Manufacturing methodologies and improved operational efficiencies resulting in an average cost savings of $47,000/year.

If three references cannot be provided, explain why:

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: California Manufacturing Technology Consulting (CMTC)

REFERENCE 1

Name of Firm: Trojan Battery Company

Address	City	State	Zip Code
12380 Clark St	Santa Fe Springs	CA	90670

Contact Person	Telephone Number
Mr. Chad Bentley, Manager, Manufacturing Technology	562-946-8381 ext. 3006
Dates of Service: January 2005 - Present	Cost of Service: $39,342

Brief Description of Service Provided

VESM Project Implementation

REFERENCE 2

Name of Firm: Mission Rubber Company

Street Address	City	State	Zip Code
1660 Leeson Lane	Corona	CA	92879

Contact Person	Telephone Number
Mr. Richard Posiviata, Plant Manager	951-736-1313 ext. 237
Dates of Service January 2001 – Present	Cost of Service $77,555

Brief Description of Service Provided
Strategic Planning, Factory Workflow Improvement, Kaizen Events, Lean Training, VESM

REFERENCE 3

Name of Firm: Aluminum Precision Products

Street Address	City	State	Zip Code
3333 West Warner Avenue	Santa Ana	CA	92704

Contact Person	Telephone Number
Dennis Dougherty, Industrial Engineer	714-445-3284
Dates of Service July 2001 – Present	Cost of Service $249,000

Brief Description of Service Provided
Factory Workflow Improvement, Lean Implementation and Training, VESM Implementation

If three references cannot be provided, explain why:

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: AMPros Corporation

REFERENCE 1

Name of Firm Wyoming Machine, Inc			
Street Address 30680 Forest Blvd	City Stacy	State MN	Zip Code 55079
Contact Person Lori Tapani		Telephone Number (651) 462-4156	
Dates of Service May – 2005 to ongoing 2006		Cost of Service $24,000 to date	

Brief Description of Service Provided
Current – Strategic Planning with customer & product profitability, key performance measures.
Prior (1999 – 2005) plant layout, process improvements, financial analysis, strategic planning, overhead & pricing restructure, capital investment strategy, information system selection

REFERENCE 2

Name of Firm: Minnesota Pollution Control Agency (was Minnesota Office of Environmental Assistance)			
Street Address 520 Lafayette Rd North	City St. Paul	State MN	Zip Code 55155-4100
Contact Person Tina Patton or Wayne Gjerde		Telephone Number (651) 215-0214 or (651) 215-0270	
Dates of Service Feb 2003 – Jan 2005		Cost of Service $65,000	

Brief Description of Service Provided
Recycling Industry Benchmarking and Financial Performance
Prior (1993 – 2004) Numerous recycling company business assessments, fiber-re-enforced plastics recycling feasibility, recycling technology assessments

REFERENCE 3

Name of Firm: Asset Recovery Corporation			
Street Address 2299 Territorial Road	City St. Paul	State MN	Zip Code 55107
Contact Person Cort Jerome		Telephone Number (651) 602-0789	
Dates of Service Dec 2002 – Jul 2003		Cost of Service $24,000	

Brief Description of Service Provided
Product and customer profitability, re-alignment of pricing strategies, process flow and cost assessment

If three references cannot be provided, explain why:

CLIENT REFERENCES

List at least three (3) client references that can attest to the Proposer's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Proposer's response. Duplicate and attach additional pages as necessary.

PROPOSER'S / SUBCONTRACTOR'S NAME: Riester~Robb Pacific, LLC

REFERENCE 1

Name of Firm **California Department of Conservation**

Street Address	City	State	Zip Code
801 K. Street	Sacramento	CA	95814

Contact Person	Telephone Number
Ed Wilson, Communications Director	(916) 324-0864
Dates of Service	**Cost of Service**
2000 - Current	$5,000,000

Brief Description of Service Provided
Riester~Robb is currently contracted with the State of California's Department of Conservation to motivate Californians to recycle. Riester~Robb provides full-service advertising and public relations to promote California's bi-lingual recycling campaign.

REFERENCE 2

Name of Firm **Arizona Department of Environmental Quality**

Street Address	City	State	Zip Code
1110 West Washington Street	Phoenix	AZ	85007

Contact Person	Telephone Number
Tammy Shreeve, Recycling Program Manager	(602) 771-4171
Dates of Service	**Cost of Service**
2004 - Current	$100,000

Brief Description of Service Provided
Riester~Robb is currently contracted with the Arizona Department of Environmental Quality to provide full-service advertising support for their recycling campaign.

REFERENCE 3

Name of Firm **River Rock Casino**

Street Address	City	State	Zip Code
16003 Healdsburg Ave.	Geyserville	CA	95448

Contact Person	Telephone Number
Tony Averitt, Marketing Director	(707) 857-2703
Dates of Service	**Cost of Service**
2002 - Current	$9,000,000

Brief Description of Service Provided
Riester~Robb currently is contracted with River Rock Casino to provide full service advertising and public relations to promote the entertainment destination in Northern California.

If three references cannot be provided, explain why:

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: Sierra Lake Group

REFERENCE 1

Name of Firm: California Integrated Waste Management Board

Street Address	City	State	Zip Code
1001 I Street	Sacramento	CA	95812

Contact Person	Telephone Number
Corky Mau	916-341-6533
Dates of Service	**Cost of Service**
November 2004- September 2005	$75,000

Brief Description of Service Provided
Provided marketing and sales planning assistance to promote growth of RMDZ companies.

REFERENCE 2

Name of Firm: Wax Box Firelog Corp.

Street Address	City	State	Zip Code
4801 Feather River Road	Oroville	CA	95965

Contact Person	Telephone Number
Myles Decker	530-570-2032
Dates of Service	**Cost of Service**
December 2004- December 2005	$25,000

Brief Description of Service Provided
Prepared a marketing plan, sales force development, and developed a strategic plan.

REFERENCE 3

Name of Firm SafePath Products

Street Address	City	State	Zip Code
820 West 7th Street	Chico	CA	95928

Contact Person	Telephone Number
Tim Vander Heiden	800-497-2003
Dates of Service	**Cost of Service**
December 2004 - October 2005	$15,000

Brief Description of Service Provided
Provided strategic marketing planning for sales to State of California agencies.

If three references cannot be provided, explain why:

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: The Carderock Group

REFERENCE 1

Name of Firm Prospectus Entertainment Ventures, LLC			
Street Address Virtual Company with no street address	City	State	Zip Code
Contact Person Nate Silver		Telephone Number 773-425-7562	
Dates of Service April 2003 to April 2005		Cost of Service Ownership Interest in Company	

Brief Description of Service Provided
Chris Schofield (Principal) served as Interim CFO. Tasks included setting up accounting system, control systems, and cleaning up outstanding structural and tax issues.

REFERENCE 2

Name of Firm Invensys			
Street Address 928 Waverly St.	City Palo Alto	State CA	Zip Code 94301
Contact Person Geoff Williamson		Telephone Number 650-575-9572	
Dates of Service April 2005 – October 2005		Cost of Service $55,791	

Brief Description of Service Provided
The Principals provided a wide range of business assistance including: business model refinement, market analysis, rfp preparation, and financial planning.

REFERENCE 3

Name of Firm Knowledge Ventures			
Street Address 2338 Immokalee Rd, 292	City Naples	State FL	Zip Code 34110
Contact Person Michael Lissack		Telephone Number 239-254-9648	
Dates of Service August 2003 - January 2004		Cost of Service Confidential	

Brief Description of Service Provided
Richard Chow (Principal) served as interim lead executive and board member. Engagement focused on refocusing the company's business plan, and ended with the sale of the company's assets to a Fortune 500 company.

If three references cannot be provided, explain why:

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: Underwriters Laboratory (UL)

REFERENCE 1

Name of Firm: General Electric Global Asset Protection Solutions

Street Address	City	State	Zip Code
20 Security Drive, Suite 201	Avon	CT	06001

Contact Person	Telephone Number
Paul Willse	(860) 507-1423
Dates of Service	**Cost of Service**
1996 - Present	Average $250,000/year

Brief Description of Service Provided
Consulting and customized solutions to address chemical composition, material and product performance, and processing needs for a wide range of products (alcoholic beverages, pallets, semi-conductor materials and commodity sprinkler systems).

REFERENCE 2

Name of Firm: Elk Composite Building Products

Street Address	City	State	Zip Code
9600 Lachman	Lenexa	KS	66219

Contact Person: Dave Porter Mike Bryson	Telephone Number: (913) 599-5300 (816) 350-1982
Dates of Service	**Cost of Service:**
1980 - Present	Approximately $100,000/year

Brief Description of Service Provided
Consulting, compliance testing and certification of roofing, decking and other building products and materials for use in the USA. Also perform UL Listing and follow-up services.

REFERENCE 3

Name of Firm: Rehrig Pacific Company

Street Address:	City:	State:	Zip Code
8875 Commerce Drive	De Soto	KS	66018

Contact Person:	Telephone Number
Mike Riola	(866) 265-4108
Dates of Service	**Cost of Service**
2001 - Present	Average $30,000/year

Brief Description of Service Provided
Physical and mechanical performance testing of polymer load carrying platforms.

If three references cannot be provided, explain why:

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: Alan Moreland, Independent Contractor

REFERENCE 1

Name of Firm: Rouse Polymerics

Street Address | City | State | Zip Code

Contact Person	Telephone Number
Michael Rouse, Founder of Rouse Polymerics	(541) 610-9900
Dates of Service:	Cost of Service:

Brief Description of Service Provided

REFERENCE 2

Name of Firm: Rubber Manufacturers Association

Street Address: | City | State | Zip Code

Contact Person	Telephone Number
Michael Blumenthal	(202) 682-1882
Dates of Service	Cost of Service

Brief Description of Service Provided

REFERENCE 3

Name of Firm: ACS Rubber Division

Street Address | City | State | Zip Code

Contact Person	Telephone Number
Ed Miller, Executive Director of ACS Rubber Division	(330) 972-6527
Dates of Service	Cost of Service

Brief Description of Service Provided

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: Recycled Tire Engineering and Research Foundation (RTERF)

REFERENCE 1

Name of Firm: Arizona Department of Environmental Quality

Street Address	City	State	Zip Code
1110 W. Washington	Phoenix	AZ	85007

Contact Person:	Telephone Number
Lamar Brown	602-771-4134
Dates of Service:	Cost of Service:
2005	$45,000

Brief Description of Service:

Conducted a one year study to develop a Research report and Users Manual, Designed Guidelines and Specifications on how to design and build crumb rubber concrete.

REFERENCE 2

Name of Firm: Northern California Rubberized Asphalt Concrete Technology Center

Street Address:	City	State	Zip Code
Sacramento Department of Public Works	Sacramento	CA	95814

Contact Person:	Telephone Number
Theron Roschen	800-373-1113
Dates of Service	Cost of Service
2005	$25,000

Brief Description of Service:
Organized and conducted a bus tour of asphalt rubber pavements and asphalt in Northern California and also organized and conducted one day workshop on the design and use of asphalt rubber for Northern California highway agencies.

REFERENCE 3

Name of Firm: Southern California Rubberized Asphalt Technology Center

Street Address	City	State	Zip Code
Los Angeles County Dept. of Public Works	Los Angeles	CA	91803

Contact Person:	Telephone Number
Raza Izadi	888-777-4775
Dates of Service	Cost of Service
2005	$25,000

Brief Description of Service: Conducted a bus tour of asphalt rubber pavements and asphalt rubber pavements in Southern California and also conducted a one day workshop on the design and use of asphalt rubber for Southern California highway agencies.

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: Bottom Line Consulting, Inc.

REFERENCE 1

Name of Firm: Charles Industries, Ltd.

Street Address	City	State	Zip Code
5600 Apollo Drive	Rolling Meadows	IL	60008

Contact Person	Telephone Number
Walter Harwood	(847) 258-8347
Dates of Service:	**Cost of Service:**
1999 - 2005	Private Client

Brief Description of Service Provided

Retained as technical expert on formulating, processing, and introducing new technology including the potential use of tire crumb in several industrial products.

REFERENCE 2

Name of Firm: Empire State Development, Environmental Services Unit

Street Address:	City	State	Zip Code
400 Andrews Street, Suite 410	Rochester	NY	14604

Contact Person	Telephone Number
James Gilbert	(585) 325-1944
Dates of Service	**Cost of Service**
2004 - 2005	Private Client

Brief Description of Service Provided

Market development and technical assistance to R. W. Beck project team to identify value-added markets, establish partnerships, and determine commercial viability.

REFERENCE 3

Name of Firm: Solar Oven Society

Street Address	City	State	Zip Code
3225 East Hennepin Ave., Suite 200	Minneapolis	MN	55413

Contact Person	Telephone Number
Michael Port	(612) 623-4700
Dates of Service	**Cost of Service**
2000 – 2006	Private Client

Brief Description of Service Provided

Retained to assist in all aspects of successful commercialization of solar cookers, including identifying qualified manufacturers, developing low cost formulation, and fine-tuning.

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: Innovative Distribution & Manufacturing, LLC

REFERENCE 1

Name of Firm: En-Tech Inc

Street Address	City	State	Zip Code
69676 M-103	White Pigeon	MI	49099

Contact Person	Telephone Number
Lavon Detweiler, Alternate Contact: Craig Detweiler	Lavon: 574-536-7691, Craig 574-596- 9243
Dates of Service:	**Cost of Service:**
April 2002 – Present	$270,000+

Brief Description of Service Provided

En-Tech contracted with Mr. Branson's company to custom build a large tire shredder. En-Tech has subsequently contracted for other projects ranging from consulting and customizing tire equipment to general design, drafting, and mechanical oversight.

REFERENCE 2

Name of Firm: Fennel Rubber

Street Address:	City	State	Zip Code
108 Stephens Place	Elmira	NY	14901

Contact Person	Telephone Number
Marty Fennell (United Dividers):	607-733-6693
Dates of Service	**Cost of Service**
July 2005 - Present	$10,000+

Brief Description of Service Provided
Mr. Branson provided consultation to help Fennel Rubber get started in crumb rubber production. Mr. Branson has also been asked to evaluate used tire shredders for addition to their company.

REFERENCE 3

Name of Firm: Delaney Construction

Street Address	City	State	Zip Code
2736 Street Highway 30	Gloversville	NY	12078

Contact Person	Telephone Number
Bob Finkle	518-365-6021
Dates of Service	**Cost of Service**
October 2005 – Present	TBD

Brief Description of Service Provided
Mr. Branson is currently assisting Delaney in the process of an eight million tire clean up for the State of New York.

Client References

List at least three (3) client references that can attest to the Bidder's qualifications to fulfill the requirements of the Scope of Work. List the most recent first. Client references must also be provided for any subcontractors identified in the Bidder's response. Duplicate and attach additional pages as necessary.

BIDDER / SUBCONTRACTOR'S NAME: TL & Associates

REFERENCE 1

Name of Firm: Lakin Tire West, Inc.

Street Address	City	State	Zip Code
15305 Spring Avenue	Santa Fe Springs	CA	90670

Contact Person	Telephone Number
Randal Roth	800-488-2752
Dates of Service:	**Cost of Service:**
2003- Present	$1000/Month

Brief Description of Service Provided

Providing business consulting and lobbying services.

REFERENCE 2

Name of Firm: BAS Recycling, Inc.

Street Address:	City	State	Zip Code
1400 North "H" Street	San Bernardino	CA	92405

Contact Person	Telephone Number
Hratch Sarkis	909-383-7050
Dates of Service	**Cost of Service**
2003- Present	$500/Month

Brief Description of Service Provided
Providing business consulting, lobbying, and grant writing services.

REFERENCE 3

Name of Firm: California Tire Dealers Association - South

Street Address	City	State	Zip Code
10240 Petit Avenue	Granada Hills	CA	91343

Contact Person	Telephone Number
Ed Cohn	818-363-8028
Dates of Service	**Cost of Service**
1994- Present	$250/Month

Brief Description of Service Provided
Providing business consulting and lobbying services.

California Integrated Waste Management Board
Tire-Derived Product Business Assistance Program
Contract #IWM05030

SECTION 7
Samples of Written Work

JANUARY 2006

R·W·BECK

SAMPLES OF WRITTEN WORK

As requested in the RFP, the R. W. Beck team has included, under separate cover, samples of written work demonstrating our success counseling/advising businesses in the recycling industry, and providing recycling market development services. Our written work samples include the reports listed in the table below.

Additional R. W. Beck written work samples can be accessed at:

http://www.dep.state.pa.us/dep/deputate/airwaste/wm/recycle/market/docs/studies.htm

Exhibit	Prepared for	Prepared by
Exhibit I Pennsylvania Recycling Markets Center Three-Year Business Plan	Pennsylvania Department of Environmental Protection	R. W. Beck, Inc., August 2003
Exhibit II Business Assessment Conclusions	Minnesota Office of Environmental Assistance	AMPros Corporation, January 2002
Exhibit III Recycling Industry Benchmarking and Performance Measurement	U.S. Environmental Protection Agency and the Minnesota Office of Environmental Assistance	AMPros Corporation, January 2005

California Integrated Waste Management Board

Tire-Derived Product Business Assistance Program

Contract #IWM05030

SECTION 8

Forms & Additional Documentation

JANUARY 2006

R·W·BECK

This section includes the following attachments and supporting documentation:

- Commitment to Terms and Conditions
- Contract Eligibility
- License Information
- 100% Post Consumer Paper Utilization
- Contractor Certification Form
- Attachment G – Contractor Status Form
- Attachment D – SB/DVBE Demonstration of Good Faith Efforts
- Attachment C – SB/DVBE Participation Summary

Commitment to Terms and Conditions

We have conducted a limited review of the [Agreement][Terms] included with the Request for Proposal and are in general agreement with the terms and conditions. However, we would like to reserve the right to discuss modifications if our proposal is accepted.

Contract Eligibility

R. W. Beck, Inc., and all subcontractors (Corporation for Manufacturing Excellence [Manex]; California Manufacturing Technology Consulting [CMTC]; AMPros Corporation; Riester-Robb Pacific, Inc.; Sierra Lake Group; The Carderock Group; Underwriters Laboratory, Inc.; Recycled Tire Research and Engineering Foundation; Alan Moreland, Ph.D.; Bottom Line Consulting, Inc.; Innovative Distribution and Manufacturing LLC; TL & Associates) are eligible to contract with the State of California pursuant to PCC Section 10286.

License Information

The requirement for a contractor's license as specified in California Business and Professional Code Section 7028.15 does not apply to this proposal, as the services being proposed and which will be performed do not fall within the statutory definitions of "contractor" pursuant to Code Sections 7026, 7026.1, 7028.2 or 7028.3. "Contractor" is generally defined in Code Section 7026 who submits a bid to construct, improve or demolish any building, highway, or similar facility, which is not within the proposed scope of this proposal. Likewise, none of R. W. Beck subcontractors will be engaged in services or work within the statutory definition of "contractor".

R. W. Beck, Inc. is a corporation organized under the Washington Business Corporations Act. Under the California Professional Engineering Act, Section 6738 and California Code of Regulations, Title 16, Division 5, Section 463, corporations offering engineering services are not "licensed". No "license" is issued and there is no expiration date. Disclosure statements are filed when there are changes in a company's roster of California-licensed professional engineers. R. W. Beck, Inc. first filed a disclosure statement in California on March 17, 1996 and continues to file periodic statements if circumstances require.

All subcontractors proposed in this submittal are not subject to licensing requirements since they do not engage in the activities that require a license under California Business and Professional Code.

Proposed subcontractors include:

- Corporation for Manufacturing Excellence (Manex)
- California Manufacturing Technology Consulting (CMTC)
- AMPros Corporation
- Riester-Robb Pacific, Inc.
- Sierra Lake Group
- The Carderock Group
- Underwriters Laboratory, Inc.
- Alan Moreland, Ph.D.
- Recycled Tire Research and Engineering Foundation
- Bottom Line Consulting, Inc.
- Innovative Distribution and Manufacturing LLC
- TL & Associates

100% Post-Consumer Paper Utilization Statement

All documents included in this submittal were printed on Environment brand paper containing 100% post-consumer recycled content fiber.

SECTION 8

CONTRACTOR CERTIFICATION FORM

CCC-1005

CERTIFICATION

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY that I am duly authorized to legally bind the prospective Contractor to the clause(s) listed below. This certification is made under the laws of the State of California.

Contractor/Bidder Firm Name (Printed)	*Federal ID Number*
R. W. Beck, Inc.	[redacted]
By (Authorized Signature) [redacted]	
Printed Name and Title of Person Signing	
Patricia K. Corbin, Vice President of Business Operations	
Date Executed	*Executed in the County of*
1-16-06	King

CONTRACTOR CERTIFICATION CLAUSES

1. STATEMENT OF COMPLIANCE: Contractor has, unless exempted, complied with the nondiscrimination program requirements. (Gov. Code §12990 (a-f) and CCR, Title 2, Section 8103) (Not applicable to public entities.)

2. DRUG-FREE WORKPLACE REQUIREMENTS: Contractor will comply with the requirements of the Drug-Free Workplace Act of 1990 and will provide a drug-free workplace by taking the following actions:

a. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations.

b. Establish a Drug-Free Awareness Program to inform employees about:

1) the dangers of drug abuse in the workplace;
2) the person's or organization's policy of maintaining a drug-free workplace;
3) any available counseling, rehabilitation and employee assistance programs; and,
4) penalties that may be imposed upon employees for drug abuse violations.

c. Every employee who works on the proposed Agreement will:

1) receive a copy of the company's drug-free workplace policy statement; and,
2) agree to abide by the terms of the company's statement as a condition of employment on the Agreement.

Failure to comply with these requirements may result in suspension of payments under the Agreement or termination of the Agreement or both and Contractor may be ineligible for award of any future State agreements if the department determines that any of the following has occurred: the Contractor has made false certification, or violated the

certification by failing to carry out the requirements as noted above. (Gov. Code §8350 et seq.)

3. NATIONAL LABOR RELATIONS BOARD CERTIFICATION: Contractor certifies that no more than one (1) final unappealable finding of contempt of court by a Federal court has been issued against Contractor within the immediately preceding two-year period because of Contractor's failure to comply with an order of a Federal court, which orders Contractor to comply with an order of the National Labor Relations Board. (Pub. Contract Code §10296) (Not applicable to public entities.)

4. CONTRACTS FOR LEGAL SERVICES $50,000 OR MORE- PRO BONO REQUIREMENT: Contractor hereby certifies that contractor will comply with the requirements of Section 6072 of the Business and Professions Code, effective January 1, 2003.

Contractor agrees to make a good faith effort to provide a minimum number of hours of pro bono legal services during each year of the contract equal to the lessor of 30 multiplied by the number of full time attorneys in the firm's offices in the State, with the number of hours prorated on an actual day basis for any contract period of less than a full year or 10% of its contract with the State.

Failure to make a good faith effort may be cause for non-renewal of a state contract for legal services, and may be taken into account when determining the award of future contracts with the State for legal services.

5. EXPATRIATE CORPORATIONS: Contractor hereby declares that it is not an expatriate corporation or subsidiary of an expatriate corporation within the meaning of Public Contract Code Section 10286 and 10286.1, and is eligible to contract with the State of California.

6. SWEATFREE CODE OF CONDUCT:

a. All Contractors contracting for the procurement or laundering of apparel, garments or corresponding accessories, or the procurement of equipment, materials, or supplies, other than procurement related to a public works contract, declare under penalty of perjury that no apparel, garments or corresponding accessories, equipment, materials, or supplies furnished to the state pursuant to the contract have been laundered or produced in whole or in part by sweatshop labor, forced labor, convict labor, indentured labor under penal sanction, abusive forms of child labor or exploitation of children in sweatshop labor, or with the benefit of sweatshop labor, forced labor, convict labor, indentured labor under penal sanction, abusive forms of child labor or exploitation of children in sweatshop labor. The contractor further declares under penalty of perjury that they adhere to the Sweatfree Code of Conduct as set forth on the California Department of Industrial Relations website located at www.dir.ca.gov, and Public Contract Code Section 6108.

b. The contractor agrees to cooperate fully in providing reasonable access to the contractor's records, documents, agents or employees, or premises if reasonably required by authorized officials of the contracting agency, the Department of Industrial Relations,

or the Department of Justice to determine the contractor's compliance with the requirements under paragraph (a).

7. DOMESTIC PARTNERS: For contracts executed or amended after July 1, 2004, the contractor may elect to offer domestic partner benefits to the contractor's employees in accordance with Public Contract Code section 10295.3. However, the contractor cannot require an employee to cover the costs of providing any benefits which have otherwise been provided to all employees regardless of marital or domestic partner status.

DOING BUSINESS WITH THE STATE OF CALIFORNIA

The following laws apply to persons or entities doing business with the State of California.

1. CONFLICT OF INTEREST: Contractor needs to be aware of the following provisions regarding current or former state employees. If Contractor has any questions on the status of any person rendering services or involved with the Agreement, the awarding agency must be contacted immediately for clarification.

Current State Employees (Pub. Contract Code §10410):

1). No officer or employee shall engage in any employment, activity or enterprise from which the officer or employee receives compensation or has a financial interest and which is sponsored or funded by any state agency, unless the employment, activity or enterprise is required as a condition of regular state employment.

2). No officer or employee shall contract on his or her own behalf as an independent contractor with any state agency to provide goods or services.

Former State Employees (Pub. Contract Code §10411):

1). For the two-year period from the date he or she left state employment, no former state officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any state agency.

2). For the twelve-month period from the date he or she left state employment, no former state officer or employee may enter into a contract with any state agency if he or she was employed by that state agency in a policy-making position in the same general subject area as the proposed contract within the 12-month period prior to his or her leaving state service.

If Contractor violates any provisions of above paragraphs, such action by Contractor shall render this Agreement void. (Pub. Contract Code §10420)

Members of boards and commissions are exempt from this section if they do not receive payment other than payment of each meeting of the board or commission, payment for preparatory time and payment for per diem. (Pub. Contract Code §10430 (e))

2. LABOR CODE/WORKERS' COMPENSATION: Contractor needs to be aware of the provisions which require every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions, and Contractor affirms to comply with such provisions before commencing the performance of the work of this Agreement. (Labor Code Section 3700)

3. AMERICANS WITH DISABILITIES ACT: Contractor assures the State that it complies with the Americans with Disabilities Act (ADA) of 1990, which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA. (42 U.S.C. 12101 et seq.)

4. CONTRACTOR NAME CHANGE: An amendment is required to change the Contractor's name as listed on this Agreement. Upon receipt of legal documentation of the name change the State will process the amendment. Payment of invoices presented with a new name cannot be paid prior to approval of said amendment.

5. CORPORATE QUALIFICATIONS TO DO BUSINESS IN CALIFORNIA:

a. When agreements are to be performed in the state by corporations, the contracting agencies will be verifying that the contractor is currently qualified to do business in California in order to ensure that all obligations due to the state are fulfilled.

b. "Doing business" is defined in R&TC Section 23101 as actively engaging in any transaction for the purpose of financial or pecuniary gain or profit. Although there are some statutory exceptions to taxation, rarely will a corporate contractor performing within the state not be subject to the franchise tax.

c. Both domestic and foreign corporations (those incorporated outside of California) must be in good standing in order to be qualified to do business in California. Agencies will determine whether a corporation is in good standing by calling the Office of the Secretary of State.

6. RESOLUTION: A county, city, district, or other local public body must provide the State with a copy of a resolution, order, motion, or ordinance of the local governing body which by law has authority to enter into an agreement, authorizing execution of the agreement.

7. AIR OR WATER POLLUTION VIOLATION: Under the State laws, the Contractor shall not be: (1) in violation of any order or resolution not subject to review promulgated by the State Air Resources Board or an air pollution control district; (2) subject to cease and desist order not subject to review issued pursuant to Section 13301 of the Water Code for violation of waste discharge requirements or discharge prohibitions; or (3) finally determined to be in violation of provisions of federal law relating to air or water pollution.

8. PAYEE DATA RECORD FORM STD. 204: This form must be completed by all contractors that are not another state agency or other governmental entity.

S:\ADMIN\HOMEPAGE\CCC\CCC-1005.doc

State of California
Secretary of State

CERTIFICATE OF STATUS
FOREIGN CORPORATION

I, BRUCE McPHERSON, Secretary of State of the State of California, hereby certify:

That on the **20th day of December, 1995, R. W. BECK, INC.,** a corporation organized and existing under the laws of **Washington**, complied with the requirements of California law in effect on that date for the purpose of qualifying to transact intrastate business in this State; and

That the above corporation is entitled to transact intrastate business in the State of California as of the date of this certificate, however, subject to any licensing requirements otherwise imposed by the laws of this State; and

That no information is available in this office on the financial condition, business activity or practices of this corporation.

IN WITNESS WHEREOF, I execute this certificate and affix the Great Seal of the State of California this day of January 4, 2006.

BRUCE McPHERSON
Secretary of State

bi

SECTION 8

ATTACHMENT G

CONTRACTOR STATUS FORM

ATTACHMENT G
Revised 12/23/05

Contractor Status Form

Contractor's Name R. W. Beck, Inc. County Sacramento County

Address 2710 Gateway Oaks Drive, Suite 310 South, Phone No. 916-929-3653

Sacramento California, 95833 Fax No. 916-929-1710

Federal Employer Identification No. [redacted]

STATUS OF CONTRACTOR PROPOSING TO DO BUSINESS:

☐ Individual ☐ Limited Partnership ☐ General Partnership ☒ Corporation ☐ Other

INDIVIDUAL:

If a sole proprietorship, state the true name of sole proprietor: _____

PARTNERSHIP:

If a partnership, list each partner, including limited partners, stating their true name and their interest in the partnership:

_____ _____

_____ _____

CORPORATION:

If a corporation, place and date of Incorporation: Washington, August 25, 1969

Date corporation was authorized by Secretary of State: August 25, 1969

President: Russell J. Stepp Vice-President: _____

Secretary: Jeffrey F. Clunie Treasurer: Elaine M. Clark

Other Officers: See attached list

OTHER: (Explain)

SMALL BUSINESS PREFERENCE

Are you claiming preference as a small business? ☐ YES –Attach approval letter from Office of Small Business Certification and Resources ☒ NO

Are you claiming preference as a non-small business? ☐ **YES –Attach approval letter from Office of Small Business Certification and Resources for all subcontractors** ☒ **NO**

Date you filed for small business preference **(if applicable)**: _____ Your small business ID No. _____

NOTE: THIS FORM MUST BE COMPLETED OR YOUR BID MAY BE REJECTED

OFFICERS

R. W. Beck, Inc.

Officers	Name
Chairman of the Board	Albert B. Malmsjo, III
President	Russell J. Stepp
Executive Vice President	Timothy R. Corrigan
	Albert B. Malmsjo, III
	Edward D. Wetzel
Senior Vice President	Stephen Gates
	William W. Reynolds
Vice President	James W. Baxter
	Neil V. Callahan
	Patricia K. Corbin
	Robert W. Craggs
	Christopher M. Dull
	Ann R. Ferland
	Francis P. Gaffney
	Paul J. Harmon
	David A. Jochim
	Joseph A. Mancinelli
	Michael W. Noga
	Kyle B. Rhorer
	Jeffrey L. Schulz
	Brown D. Thornton
	David S. Yanke
Assistant Vice President	Robert A. Brune
	Karl R. Hufnagel
	Peter J. Robertshaw
	Jennifer B. Tripp
Secretary	Jeffrey F. Clunie
Treasurer	Elaine M. Clark
Chief Financial Officer	Albert B. Malmsjo, III
Chief Operating Officer	Albert B. Malmsjo, III
Assistant Secretary	Lin Ross
Assistant Treasurer	William G. LaBonte
	Ellen Namba
	Connie Segel

SECTION 8

ATTACHMENT D

SB/DVBE DEMONSTRATION OF GOOD FAITH EFFORTS

ATTACHMENT D
Revised 12/23/05

Small Business Demonstration of Good Faith Efforts

1	Contact made with California Integrated Waste Management Board to identify potential SB/DVBE firms.

Name of Person Contacted: _____Carol Baker_____ Title:__CIWMB Contact for RFP IWM05030__

Date of Contact: _____1/12/06_____

2	Contact made with other State agencies, including the Department of General Services, to identify potential SB/DVBE firms.

Agencies Contacted:

Name of Agency	Person	Date of Contact
1. Department of General Services	http://www.pd.dgs.ca.gov/smbus/default.htm	1/12/06

3	Advertisements published in trade papers or other publications focusing on SB/DVBE firms. **Proposers must publish advertisements in trade and focus publications at least 14 calendar days before the date the Proposal is due, unless a different timeline has been identified.**

Name of Paper or Publication	Date Published
1. Eldridge Bid Reporter/ Trade and Focus (see attached ad)	12/21/05
2. Small Business Exchange/ Trade and Focus (see attached ad)	12/29/05

Note: Attach a copy of each advertisement. Planholder lists are not acceptable.

4	Invitations to bid sent to potential SB/DVBE firms.

FIRM	CONTACT	DATE SENT
1. The Sierra Lake Group	Mike Tinney, MikeTinney@aol.com 916-849-2114/OSDC#0037388	1/12/06
2. Designed Internet Solutions	Dan Biggs, dbiggs@designedinternet.com, (619) 421-2107	1/12/06
3. EllerStone D'Paul, Inc.	Richard Steen, richard.steen@esdpconsulting.com, (916) 773-3768	1/12/06
4. OHSO! DESIGN	sbc@ohsodesign.com, (562) 787-9444 1/12/06	1/12/06

Demonstration of Good Faith Efforts (Cont'd)

5	**SB**/DVBE firms which were available and considered.

Name of Firm: __The Sierra Lake Group_____ Person Contacted: _Mike Tinney_____

Nature of Work: ___ Market Planning, General Business Assistance, Industry/Sector Wide Assistance
Telephone No.: _916-849-2114_____

Results of Contact: _Selected to join team._____

Reasons if Rejected:
___N/A_____

Name of Firm: ___ **No other R. W. Beck invitations sent to potential small businesses received serious responses.**

Person Contacted: _____

Nature of Work: _____ Telephone No.: _____

Results of Contact:
_____

Reasons if Rejected:
_____

Name of Firm: _____ Person Contacted: _____

Nature of Work: _____ Telephone No.: _____

Results of Contact:
_____

Reasons if Rejected:
_____

ATTACHMENT D
Revised 12/23/05

DVBE Demonstration of Good Faith Efforts

1	Contact made with California Integrated Waste Management Board to identify potential SB/DVBE firms.

Name of Person Contacted: _____Carol Baker_____ Title:__CIWMB Contact for RFP IWM05030__

Date of Contact: _____1/12/06_____

2	Contact made with other State agencies, including the Department of General Services, to identify potential SB/DVBE firms.

Agencies Contacted:

Name of Agency	Person	Date of Contact
1. Department of General Services	http://www.pd.dgs.ca.gov/smbus/default.htm	1/12/06
2. Disabled Veterans.com	http://www.bedaily.com	1/12/06

3	Advertisements published in trade papers or other publications focusing on SB/DVBE firms. **Proposers must publish advertisements in trade and focus publications at least 14 calendar days before the date the Proposal is due, unless a different timeline has been identified.**

Name of Paper or Publication	Date Published
1. Eldridge Bid Reporter/ Trade and Focus (see attached ad)	12/21/05
2. Small Business Exchange/ Trade and Focus (see attached ad)	12/29/05

Note: Attach a copy of each advertisement. Planholder lists are not acceptable.

4	Invitations to bid sent to potential SB/DVBE firms.

FIRM	CONTACT	DATE SENT
1. Designed Internet Solutions	Dan Biggs, dbiggs@designedinternet.com, (619) 421-2107	1/12/06
2. SDV/ACCI	Alex Norton, anorton@sdvacci.com, (510) 538 4280	1/12/06
3. EllerStone D'Paul, Inc.	Richard Steen, richard.steen@esdpconsulting.com, (916) 773-3768	1/12/06

Demonstration of Good Faith Efforts (Cont'd)

5	SB/DVBE firms which were available and considered.

Name of Firm: **R. W. Beck invitations sent to potential DVBE firms received no serious responses.**

Person Contacted: _____

Nature of Work: _____ Telephone No.: _____

Results of Contact:

_____

Reasons if Rejected:

_____

Name of Firm: _____ Person Contacted: _____

Nature of Work: _____ Telephone No.: _____

Results of Contact:

_____

Reasons if Rejected:

_____

Name of Firm: _____ Person Contacted: _____

Nature of Work: _____ Telephone No.: _____

Results of Contact:

_____

Reasons if Rejected:

_____

:: Online Sub-bid Advertisements ::
(Advertisements from The California Bid Bulletin, MWDVBE Weekly and California Bid Register Daily)

Posted: 12/21/05

Requesting Website development services from qualified SB/DVBE firms for:
California Integrated Waste Management Board
Tire-Derived Product Business Assistance Program due 1/13/06
Statewide

Website development services for small- and medium-sized manufacturing firms.

R. W. Beck, Inc.

2710 Gateway Oaks Drive, Suite 300
Sacramento, CA 95833
Contact: Ed Boisson
415.499.0919
eboisson@rwbeck.com

Published In The:
California Bid Register 12/21/05

SMALL BUSINESS EXCHANGE

PROOF OF PUBLICATION

(2015.5 C.C.P)

STATE OF CALIFORNIA, SS
County of San Francisco

I am a citizen of the United States and a resident of the County aforesaid. I am over the age of eighteen years, and not a party to or interested in the above matter. I am the principal clerk of the printer and publisher of The Small Business Exchange, Inc., a newspaper of general circulation printed and published weekly in the City and County of San Francisco, State of California on the date of January 29, 1988, that the notice of which the annexed is a printed copy (set in type not smaller than non pareil), has been published on sbeinc.com on the following date(s), to wit:

12.27.05 01.03.06 _____ _____

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 12.29.05 at San Francisco, California.

_____
(Signature)

Insertion # _____

Corporate Office

P. O. Box 190668 • San Francisco, CA 94199-0668 Phone (415) 778-6250 Toll Free (800) 800-8534 FAX (415) 778-6255

R.W. Beck, Inc - Tire Derived Product Business Assistance ProgramSeeking DVBE / SBE with Manufactoring Business Consulting Experience and/or Commercial Web Site Design Experience.Tire Derived Product Business Assistance ProgramProject No: CIWMB RFP# IWM05030Location: StatewideBid Date: January 13, 2006 @ 2:00 PMRespond By: January 11, 2006R.W. beck, Inc48 Cushing Ave. " San Rafael, CA 94903Phone: (415) 499-0919 " Fax:(866) 286-8682Contact: Edward BoissonEmail: eboisson@rwbeck.comAEOE

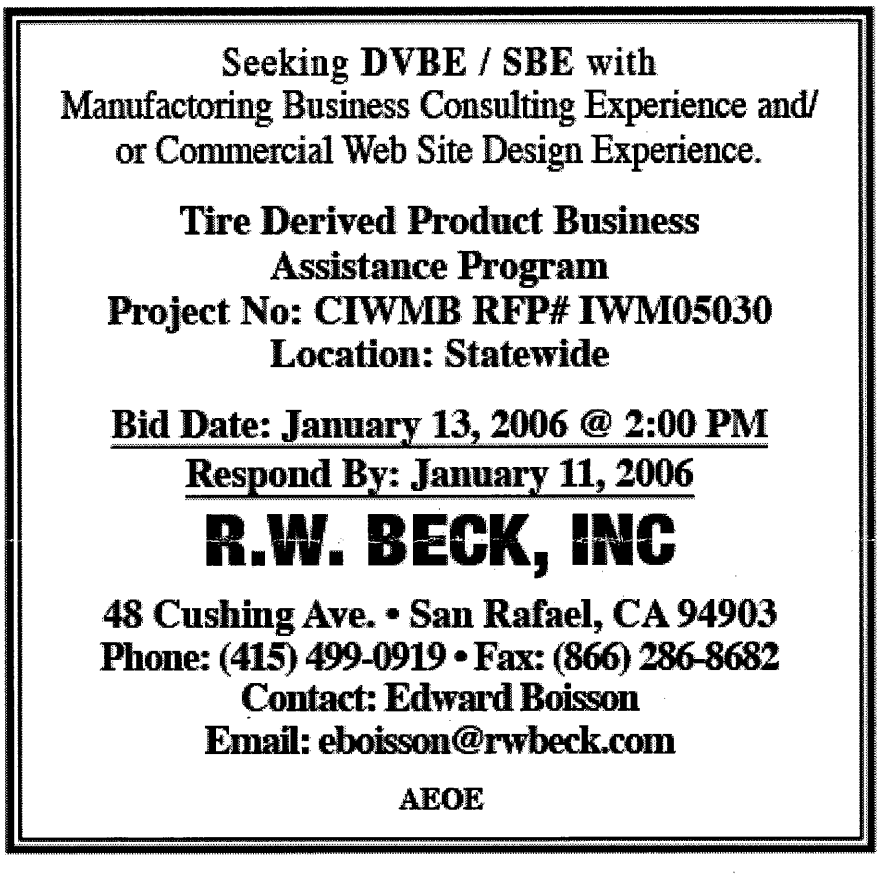
Name of ad: 05-2442.gif

Date added: December 27, 2005 10:44 AM

Expires: January 3, 2006

Project Name: R.W. Beck, Inc - Tire Derived Product Business Assistance Program

Keywords: *R.W. Beck, Inc - Tire Derived Product Business Assistance ProgramSeeking DVBE / SBE with Manufactoring Business Consulting Experience and/or Commercial Web Site Design Experience.Tire Derived Product Business Assistance ProgramProject No: CIWMB RFP# IWM05030Location: StatewideBid Date: January 13, 2006 @ 2:00 PMRespond By: January 11, 2006R.W. beck, Inc48 Cushing Ave. " San Rafael, CA 94903Phone: (415) 499-0919 " Fax:(866) 286-8682Contact: Edward BoissonEmail: eboisson@rwbeck.comAEOE*



REQUESTS FOR BIDS & SUB-BIDS

Request for Qualified **DBE** Subcontracctor & Suppliers

Caltrans
10-SJ-5,205-R20.0/R22.0, R3.8/R21.6
10-300164
Widen Route 205 in Tracy

Bid Date: Jan 10, 2006 at 2:00 pm

Subcontractor and Supplier opportunities include all aspects of highway construction, including but not limited to Misc. Highway Removals, Clear & Grub, Excavation, Signs & Markers, Sign Structures, Traffic Control, MBGR, Lead Compliance, Minor Structures, Retaining Walls, Bridge work, AC Dike, Replace PCC Pavement, Aggregate Base, Asphalt Concrete, Pavement Reinforcing Fabric, Cold Planning, Storm Drain, Fencing, Concrete Barriers, Rebar, Trucking, Erosion Control, Striping, Signals & Lighting, Traffic Monitoring Station, Weigh-in-Motion

Bonding required: 100% Payment & 100% Performance.
Assistance with bonding, credit, insurance, equipment, supplies, plans & specs available upon request (see phone number below). Additional information available at www.dot.ca.gov/hq/esc/oe

Teichert Construction, Heavy & Highway Division

PO Box 276830 • Sacramento, CA 95827-6830
Phone: (916)386-5900 • Fax : (916)386-2940

AEOE

Request for Qualified DBE Subcontractors & Suppliers

Caltrans
10-SJ-5,205-R20.0/R22.0, R3.8/R21.6
10-300164
Widen Route 205 in Tracy

Bid Date: Jan 10, 2006 at 2:00 pm

Please contact Teichert at (916) 386-5900 or fax (916) 386-2940 for the following: Subcontractor and Supplier opportunities include all aspects of highway construction, including but not limited to Misc. Highway Removals, Clear & Grub, Excavation, Signs & Markers, Sign Structures, Traffic Control, MBGR, Lead Compliance, AC Dike, , Aggregate Base, Asphalt Concrete, Pavement Reinforcing Fabric, Cold Planning, Crack PCC Pavement, Storm Drain, Fencing, Trucking, Erosion Control, Striping, Signals & Lighting, Traffic Monitoring Station, Weigh-in-Motion

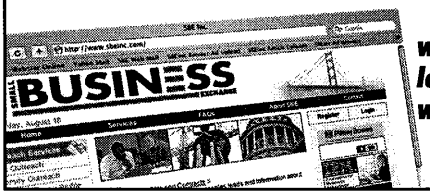
Please contact FCI at (707) 742-6053 or fax (707) 746-1603 for the following: Subcontractor and Supplier opportunities include all aspects of bridge construction, including but not limited to Bridge Removal, Piling and CIDH, Joint Seal Assembly, Rebar, Shotcrete, O/H Signs, Painting, Concrete Barrier, Minor Structures, Masonry Soundwall, Retaining Walls, Replace PCC Pavement, Precast Concrete Girders, Polyester Concrete, Ready Mix, Concrete Pumping, Structural Steel, Misc. Metals and Restrainer, Tie-Back Anchors, Trucking.

Bonding required: 100% Payment & 100% Performance.
Assistance with bonding, credit, insurance, equipment, and supplies available upon request (see phone number below). Plans and specs available in Teichert's Sacramento office, FCI's Benicia office at 2100 Goodyear Rd. Benicia, CA 94510 and local plan rooms. Additional information available at www.dot.ca.gov/hq/esc/oe

Teichert Construction / FCI Constructors A Joint Venture
PO Box 276830
Sacramento, CA 95827-6830
(916) 386-5900 Fax (916) 386-2940
An Equal Opportunity Employer

Need More Information?

Click into the Small Business Exchange's bank of business information...



www.sbeinc.com
louisianabusinessjournal.com
www.sbelosangeles.com

Request for Qualified **DBE** Subcontractors & Suppliers

Caltrans
03-Gle-32-9.5/17.4
03-1A8304
Reconstruct AC Pavement and Cold Foam Recycled Base

Bid Date: Jan 4, 2006 at 2:00 pm

Subcontractor and Supplier opportunities include but not limited to SWPPP, Construction Area Signs, Traffic Control, Striping, Lead Compliance, Shoulder Backing, Cold Foam Recycle, Asphalt Concrete, Cold Plane Pavement, Trucking, Erosion Control, Striping, Modify Traffic Monitoring Station and Signal

Bonding required: 100% Payment & 100% Performance.
Assistance with bonding, credit, insurance, equipment, supplies, plans & specs available upon request (see phone number below). Additional information available at www.dot.ca.gov/hq/esc/oe

Teichert Construction, Heavy & Highway Division

PO Box 276830
Sacramento, CA 95827-6830
(916) 386-5900 Fax (916) 386-2940
An Equal Opportunity Employer

Request for Sub Bids From Qualified
MBE / WBE
Subcontractors and Suppliers
Medical Cost Review and
Cost Containment Services
Project Location: LA DWP

Bid Date: January 18, 2006 @ 3:00 PM
Respond By: January 6, 2006

CompIQ
5 Tesla Way, Suite 100 • Irvine, CA 92618
Phone: (949)923-4057 • Fax: (949) 923-4957
Contact: Darlene Uriarte
Email: edarleneuriarte@compiq.com

AEOE

Request for Sub Bids From Qualified
DVBE
Subcontractors/Supplier

Installation and Maintenance of California Highway Patrol Scales

WEST COAST SCALES
1335 Wagstaff Road
Paradise, CA 95969
Phone: (530) 876-0733
Fax: (530) 876-0458
Contact: Mike Cameron
AEOE

Seeking **DVBE / SBE** with
Manufactoring Business Consulting Experience and/ or Commercial Web Site Design Experience.

Tire Derived Product Business Assistance Program
Project No: CIWMB RFP# IWM05030
Location: Statewide
Bid Date: January 13, 2006 @ 2:00 PM
Respond By: January 11, 2006

R.W. BECK, INC
48 Cushing Ave. • San Rafael, CA 94903
Phone: (415) 499-0919 • Fax: (866) 286-8682
Contact: Edward Boisson
Email: eboisson@rwbeck.com

AEOE

Visit www.sbeinc.com & www.sbelosangeles.com for more Bids and Sub-Bid requests

****

Bid Updates available to Subscribers through Daily Fax, Email or Internet Access

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Request for Certified DBE Subcontractors & Suppliers for:
CA Dept. of Transportation
CT 10-300164
10-SJ-5,205-R20.0/R22.0,R3.8/R21.6
San Joaquin County in and near Tracy Rte 205 from Hansen Rd O/C to Rte 205/Rte 5 Connector Separation and on Rte 5 from Tom Paine Slough Bridge To South of Paradise Cut Overflow Bridge.
Bid Date: January 10, 2006 @ 2:00 PM

OCJ is soliciting quotes for Road Work Items (including but not limited to) Traffic Control System (8,11,13-17), Pavement Delineation (9,10,19-22,191-194), Signal and Electrical Systems (195-203), AC Dike (86-88), Erosion Control (64-70), Irrigation & Planting (63,71-73), Overhead Signs, (147-149), Guard Barriers (18, 25-27, 175-185), Chain Link Railing (173-174), Road Signs (7, 23, 28, 150-153, 168-170), Clearing & Demolition (35-49), Crack Sealing (78), Crack & Seal Concrete (92), Pavement Fabric & Emulsions (83, 84, 90), Underground Storm (156-162), Minor Concrete (31, 32, 121, 163-164) and Hauling
Contact: Greg Souder @ OCJ 510-526-3424

CC Myers is soliciting quotes for Structural Concrete Items (including but not limited to): Material Hauling, Deck Treatment (36,130,131), Bridge Demolition (38-48), PCC Pavement Replacement (91), CIDH Piling (94-95), Drives Piling (96-108), Tieback Anchors (109), Precast Girders (126-129), Joint Seals (125, 133-136), Bar Reinforcing Steel (94-95, 116-118, 122, 137-141, 186-190), Masonry (132), Shotcrete (142), Structural Steel (144-146), Painting (154-155), Misc. Metals (165-167), and Concrete Barriers (186-190),
Contact: Steve Francis @ CC Myers, Inc. 916-635-9370

O.C. Jones & Sons, Inc. and C.C. Myers, Inc. a Joint Venture
1520 Fourth Street • Berkeley, CA 94710
Phone: (510) 526-3424 • Fax (510) 526-0990
Contact: Greg Souder
An Equal Opportunity Employer

100% Performance & Payment Bonds may be required. Please call OCJ/CCM for assistance with bonding, insurance and lines of credit. Plans & Specs are available for viewing at our office.

REQUESTS FOR BIDS & SUB-BIDS

Seeking **DVBE / SBE** with
Manufactoring Business Consulting Experience and/
or Commercial Web Site Design Experience.

Tire Derived Product Business
Assistance Program
Project No: CIWMB RFP# IWM05030
Location: Statewide

Bid Date: January 13, 2006 @ 2:00 PM
Respond By: January 11, 2006

R.W. BECK, INC

48 Cushing Ave. • San Rafael, CA 94903
Phone: (415) 499-0919 • Fax: (866) 286-8682
Contact: Edward Boisson
Email: eboisson@rwbeck.com

AEOE

Request for Certified DBE
Subcontractors & Suppliers for:
CA Dept. of Transportation
CT 10-300164
10-SJ-5,205-R20.0/R22.0,R3.8/R21.6
San Joaquin County in and near Tracy
Rte 205 from Hansen Rd O/C to Rte 205/Rte 5 Connector Separation and on Rte 5 from Tom Paine Slough Bridge To South of Paradise Cut Overflow Bridge.
Bid Date: January 10, 2006 @ 2:00 PM

OCJ is soliciting quotes for Road Work Items (including but not limited to) Traffic Control System (8,11,13-17), Pavement Delineation (9,10,19-22,191-194), Signal and Electrical Systems (195-203), AC Dike (86-88), Erosion Control (64-70), Irrigation & Planting (63,71-73), Overhead Signs, (147-149), Guard Barriers (18, 25-27, 175-185), Chain Link Railing (173-174), Road Signs (7, 23, 28, 150-153, 168-170), Clearing & Demolition (35-49), Crack Sealing (78), Crack & Seal Concrete (92), Pavement Fabric & Emulsions (83, 84, 90), Underground Storm (156-162), Minor Concrete (31, 32, 121, 163-164) and Hauling
Contact: Greg Souder @ OCJ 510-526-3424

CC Myers is soliciting quotes for Structural Concrete Items (including but not limited to): Material Hauling, Deck Treatment (36,130,131), Bridge Demolition (38-48), PCC Pavement Replacement (91), CIDH Piling (94-95), Drives Piling (96-108), Tieback Anchors (109), Precast Girders (126-129), Joint Seals (125, 133-136), Bar Reinforcing Steel (94-95, 116-118, 122, 137-141, 186-190), Masonry (132), Shotcrete (142), Structural Steel (144-146), Painting (154-155), Misc. Metals (165-167), and Concrete Barriers (186-190),
Contact: Steve Francis @ CC Myers, Inc. 916-635-9370

O.C. Jones & Sons, Inc. and C.C. Myers, Inc. a Joint Venture
1520 Fourth Street • Berkeley, CA 94710
Phone: (510) 526-3424 • Fax (510) 526-0990
Contact: Greg Souder

An Equal Opportunity Employer

100% Performance & Payment Bonds may be required. Please call **OCJ/CCM** for assistance with bonding, insurance and lines of credit. Plans & Specs are available for viewing at our office.

Sub-Bids Requested From
Qualified DBE Subcontractors & Suppliers

YEAGER SKANSKA INC.

Caltrans
SR14 Widening
Contract No. 06-408404
Mojave, CA

Bid Date: JANUARY 4, 2006 @ 2:00 PM

Quotes requested for supplies and services including, but not limited to:
Asphalt, Clearing & Grubbing, Erosion Control, Furnish & Drive Piling, Joint Seal – Water Stop, Sign Structure, Alternative Pipe Culvert, Rock Slope Protection, Misc. Iron & Steel Frame, Cover & Grate, Thermoplastic Traffic Stripe & Marking, Message Signs, Lighting & Sign Illumination, Construction Area Signs, Highway Planting, Aggregate Base, Prestressing Concrete Cast in Place, Reinforcing Steel, Roadside Sign, Reinforced Concrete Pipe, Fencing, Concrete Barrier, Heavy Equipment Rental.

YEAGER SKANSKA INC.

1995 Agua Mansa Road • Riverside, CA 92509-2405
Phone: (951) 684-5360 • Fax: (951) 788-2449
Contact: Bill Miller

Plans and Specifications are available for view at our main office in Riverside or at the Department of Transportation by calling (916) 654-4490
100% Performance & Payment Bonds will be required. **Yeager Skanska Inc.** will assist in bonding and insurance and will pay the cost of bonds up to 1.5%

AEOE

Request for Qualified DBE Subcontractors & Suppliers

Caltrans
10-SJ-5,205-R20.0/R22.0, R3.8/R21.6
10-300164
Widen Route 205 in Tracy

Bid Date: Jan 10, 2006 at 2:00 pm

Please contact Teichert at (916) 386-5900 or fax (916) 386-2940 for the following: Subcontractor and Supplier opportunities include all aspects of highway construction, including but not limited to Misc. Highway Removals, Clear & Grub, Excavation, Signs & Markers, Sign Structures, Traffic Control, MBGR, Lead Compliance, AC Dike, , Aggregate Base, Asphalt Concrete, Pavement Reinforcing Fabric, Cold Planning, Crack PCC Pavement, Storm Drain, Fencing, Trucking, Erosion Control, Striping, Signals & Lighting, Traffic Monitoring Station, Weigh-in-Motion

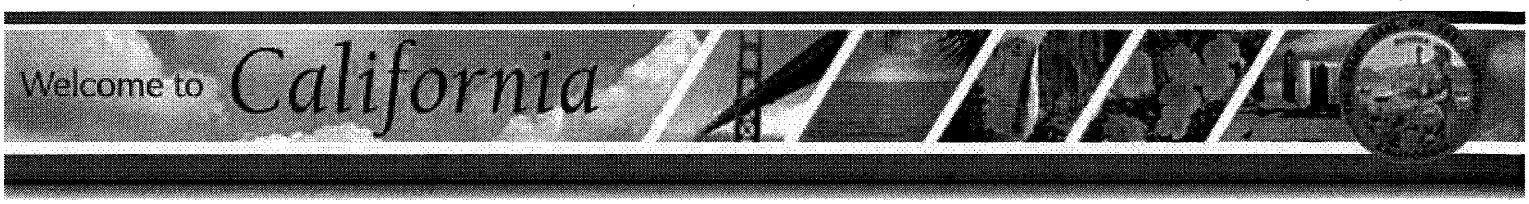
Please contact FCI at (707) 742-6053 or fax (707) 746-1603 for the following: Subcontractor and Supplier opportunities include all aspects of bridge construction, including but not limited to Bridge Removal, Piling and CIDH, Joint Seal Assembly, Rebar, Shotcrete, O/H Signs, Painting, Concrete Barrier, Minor Structures, Masonry Soundwall, Retaining Walls, Replace PCC Pavement, Precast Concrete Girders, Polyester Concrete, Ready Mix, Concrete Pumping, Structural Steel, Misc. Metals and Restrainer, Tie-Back Anchors, Trucking.

Bonding required: 100% Payment & 100% Performance.
Assistance with bonding, credit, insurance, equipment, and supplies available upon request (see phone number below). Plans and specs available in Teichert's Sacramento office, FCI's Benicia office at 2100 Goodyear Rd. Benicia, CA 94510 and local plan rooms. Additional information available at www.dot.ca.gov/hq/esc/oe

Teichert Construction / FCI Constructors A Joint Venture

PO Box 276830
Sacramento, CA 95827-6830
(916) 386-5900 Fax (916) 386-2940
An Equal Opportunity Employer

California Home Thursday, January 12, 2006



Certified Firms Search

Certification Status Search

Certified Firm Profile Login

Suspended Firms

Suspension Definition

DVBE and Small Business Program Violations and Sanctions

SB/DVBE Services Home

Search Results

Search Criteria
Certification Type(s): *Small Business, DVBE,* **Business Type(s):** *Service,* **Keywords=** *website,*

Your search found a total of 44 record(s).
Click on firm's name to display their certification information.

New Search Modify Search Export all 44 Search Result Records

ENTERPRISING SOLUTIONS SB/MB
1051 CENTURY DR
NAPA, CA 94558
Email: gweinerth@earthlink.net
Web Page:
OSDS Ref# 30270
Phone: (707) 337-8187
FAX:

THOMAS/FERROUS INC SB/MB
1900 6TH ST
SACRAMENTO, CA 95814
Email: info@thomasferrous.com
Web Page: http://www.thomasferrous.com/
OSDS Ref# 36344
Phone: (916) 440-9600
FAX: (916) 447-0234

NETSTAR COMPUTER SERVICE SB/MB
7805 TEMPLE LN
CITRUS HEIGHTS, CA 95610
Email: elliot@netstarcs.com
Web Page: http://www.netstarcs.com/
OSDS Ref# 39530
Phone: (916) 708-0888
FAX: (208) 361-4742

SOFT-TRAIN INC SB/MB
1820 E. FIRST STREET, SUITE 200
SANTA ANA, CA 92705
Email: bill.pasqualino@soft-train.com
Web Page: http://www.soft-train.com/
OSDS Ref# 11699
Phone: (714) 973-7100
FAX: (714) 973-7144

ISLAND BREEZE WEB SOLUTIONS SB/MB
1611 POMONA RD #B
CORONA, CA 92880
Email: sales@islandbreeze.com
Web Page: http://www.islandbreeze.com/
OSDS Ref# 36399
Phone: (909) 737-5264
FAX: (909) 737-2882

PEOPLE INFORMATION EARTH SERVICES LLC DVBE
1551 SAN LUCAS ST
SEASIDE, CA 93955
Email: cary.pie@gmail.com
Web Page: http://www.pieservices.net/
OSDS Ref# 41419
Phone: (831) 915-9449
FAX: (831) 242-7091

ACCENT ON LANGUAGES INC SB/MB
2418 5TH ST STE B
BERKELEY, CA 94710
Email: francine@accentolanguages.com
Web Page: http://www.accentonlanguages.com/
OSDS Ref# 28175
Phone: (510) 644-9470
FAX: (510) 644-9581

JUNGLE COMMUNICATIONS INC SB/MB
OSDS Ref# 18005

TMA STUDIO SB/MB
2233 MARTIN ST #113
IRVINE, CA 92612
Email: info@tmastudio.com
Web Page:
OSDS Ref# 39222
Phone: (949) 724-8899
FAX: (949) 724-9731

THE BRICK GROUP SB/MB
P O BOX 3018
CULVER CITY, CA 90230
Email: dmdavis@thebrickgroup.com
Web Page: http://www.thebrickgroup.com/
OSDS Ref# 27718
Phone: (310) 306-1300
FAX: (310) 821-1723

KIMTECH COMPUTER SERVICES SB/MB
4903 W PICO BLVD #201
LOS ANGELES, CA 90019
Email: kcscomputers@aol.com
Web Page:
OSDS Ref# 30735
Phone: (323) 937-4322
FAX: (323) 735-5066

HIQUE ENTERPRISES SB/MB
P O BOX 14113
FREMONT, CA 94539
Email: bestman@hique.com
Web Page: http://www.hique.com/
OSDS Ref# 25266
Phone: (510) 795-1329
FAX: (202) 318-7130

PACIFIC MEDIA SB/MB
3100 CORONADO DR
SANTA CLARA, CA 95054
Email: knelson@pacificmedia.com
Web Page: http://www.pacificmedia.com/
OSDS Ref# 29139
Phone: (408) 987-4000
FAX: (408) 987-4014

O'BRIEN HIGH TECH INDUSTRIES SB/MB
5902 FRANMAR CIR
HUNTINGTON BEACH, CA 92649
Email: ohtind@obrienhightech.com
Web Page: http://www.obrienhightech.com/
OSDS Ref# 35306
Phone: (714) 943-3759
FAX: (714) 377-7503

GLOBAL LANGUAGE SOLUTIONS SB/MB
1101 DOVE ST STE 250
NEWPORT BEACH, CA 92660
Email: info@globallanguages.com
Web Page: http://www.globallanguages.com/
OSDS Ref# 26325
Phone: (949) 798-1400
FAX: (949) 798-1410

INFO 2 EXTREME INC SB/MB
5777 W CENTURY BLVD STE 1680
LOS ANGELES, CA 90045
Email: arnie@i2x.net
Web Page: http://www.i2x.net/
OSDS Ref# 30627
Phone: (310) 641-6551
FAX: (310) 641-8113

ESCOE BLISS COMMUNICATION INC SB/MB
1442 IRVINE BLVD STE 209
TUSTIN, CA 92780
Email: aescoe@escoebliss.com
Web Page: http://www.escoebliss.com/
OSDS Ref# 4637
Phone: (888) 814-3633
FAX: (714) 505-0239

LJU DESIGN SB/MB
1815 PREUSS RD
LOS ANGELES, CA 90035
Email: ljudes@ljudesign.com
Web Page: http://www.ljudesign.com/
OSDS Ref# 34380
Phone: (310) 558-3753
FAX: (310) 558-4908

INTERSTREAMER MEDIA INC SB/MB
9415 CULVER BLVD
CULVER CITY, CA 90232
Email: info@DOGMASTUDIOS.com
Web Page: http://www.dogmastuidos.com/
OSDS Ref# 38169
Phone: (310) 838-2973
FAX: (340) 318-5307

Web Page: http://www.blancavaldez.com/

TECHXPRESS SB/MB
3450 BROAD ST STE 108
SAN LUIS OBISPO, CA 93401
Email: bsarlitt@techxpress.net
Web Page: http://www.techxpress.net/

OSDS Ref# 35695
Phone: (805) 541-4400
FAX: (805) 541-4494

HURD & ASSOCIATES SB/MB
1250 PINE ST STE 102
WALNUT CREEK, CA 94596
Email: info@ihurd.com
Web Page: http://www.ihurd.com/

OSDS Ref# 27844
Phone: (925) 930-8580
FAX: (925) 930-6691

AW PRODUCTION INC SB/MB
932 S SAN PEDRO ST
LOS ANGELES, CA 90015
Email: info@apparelwest.com
Web Page: http://www.apparelwest.com/

OSDS Ref# 35536
Phone: (213) 228-8975
FAX: (213) 228-8976

EARTHBOUND INTERACTIVE LLC SB/MB
14988 SAND CANYON AVE, STUDIO 5
IRVINE, CA 92618
Email: info@earthboundmedia.com
Web Page: http://www.earthboundmedia.com/

OSDS Ref# 27046
Phone: (949) 857-4000
FAX: (949) 857-4004

SECTION 8

ATTACHMENT C

SB/DVBE PARTICIPATION SUMMARY

Small Business/Disabled Veteran Business Enterprises (DVBE) Participation Summary

MARK ONE FOR EACH FIRM USED			NAME OF FIRM	NATURE OF WORK	TOTAL AMOUNT OF WORK (Mark one for each firm used)		IS CERTIFICATION FORM ATTACHED?
PRIME BIDDER	SUBCON-TRACTOR	SUPPLIER			SMALL	DVBE	
	X		**The Sierra Lake Group**	**Market Planning, General Business Assistance, Industry/Sector Wide Assistance**	**SB 3%**	**$**	**Yes**
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	
					$	$	

The appropriate certification letter issued by the Office of Small Business and Disabled Veteran Business Enterprise Certification (OSDC) should be attached for each small and DVBE business identified

State of California • Department of General Services • Arnold Schwarzenegger, Governor
PROCUREMENT DIVISION
Office of Small Business and DVBE Certification
707 Third Street, 1st Floor, Room 400 • PO Box 989052
West Sacramento, California 95798-9052 • (800) 559-5529

SB APP 20041227

December 27, 2004

REF# 0037388
SIERRA LAKE GROUP INC
PO BOX 784
ESCONDIDO CA 92033

Dear Business Person:

Congratulations on your certified small business status with the State of California. Your certification entitles you to benefits under the state's Small Business Participation Program within state contracting, including a five percent bidding preference and special provisions under the Prompt Payment Act.

Certification period

Your certification period for each business type is:

Industry	
NON-MANUFACTURER	[illegible]

Annual Submission Requirement

To maintain your certified status, you must annually submit to the Office of Small Business and DVBE Certification (OSDC), proof of annual receipts and proof of employees for your firm and each of your affiliates (if any).

Proof of Annual Receipts

Submit to OSDC, a copy of your firm's and any affiliate firm's ENTIRE federal tax return each year following your certification. Include ALL accompanying schedules, forms, statements, and any other support documents filed with that specific tax return.

If you request a tax filing extension with the Internal Revenue Service, submit to our office a copy of the extension form. When your tax returns are filed, submit a copy of the entire federal tax return to our office.

Proof of Employees

If you have employees whose taxable wages are reported to the California Employment Development Department (EDD) on a quarterly basis, you must annually submit to our office along with your proof of annual receipts, proof of employees for your firm and any affiliates.

We will accept a copy of the EDD's "Quarterly Wage and Withholding Report" (Form DE6) or other format accepted by the EDD. Your employee documents must cover the same four quarters as the tax return you submit for your proof of annual receipts.

If you have out-of-state employees, submit the employee documentation comparable to EDD's "Quarterly Wage and Withholding Report" for the same four-quarter period.

Maintain Your Online Certified Firm Profile

California Integrated Waste Management Board

Tire-Derived Product Business Assistance Program

Contract #IWM05030

APPENDIX A

Sample Information Request Form

JANUARY 2006

R·W·BECK

California Tire-Derived Product Business Assistance Program

INFORMATION REQUEST FORM – REQUIRED FOR BUSINESS ASSESSMENTS

DRAFT

Note: The R.W. Beck Team proposes to work with the Board to prioritize and refine this information request form through a facilitated work plan retreat to be held within two weeks of receiving the Board's notice-to-proceed.

1. Contact Information

Business Name _____
Address1 _____
Address2 _____
City _____ **County or Province** _____ **State**_____
Contact Person _____
Telephone1 _____ Telephone2 _____ Fax Number _____
Email Address _____ Web Site _____
Other Contact Information _____

2. Check List of Required Financial and Operations Information

- ❑ Business Assistance Application Submitted to CIWMB with All Attachments
- ❑ Business Organization Type (partnership, "C", etc) _____
- ❑ NAICS Classification _____ or SIC Code _____
- ❑ Financial Reports for fiscal periods 2005, 2004 and 2003 (Preferably in EXCEL or ACCESS format)
- ❑ Accountants notes to each Financial Report Period
- ❑ Descriptive Chart of Accounts
- ❑ 3 to 5 Year Revenue, Profit, Material Processing and Asset Growth Goals
- ❑ Most Recent Business Plan, Strategic Plan, Marketing Plan & Quality Plan
- ❑ Examples of Marketing Materials, Brochures & Advertisements
- ❑ Major Equipment list with Associated Capacity in Wt Material Processed or PTE for Each Item.
- ❑ Number of Operating Shifts & Number of People by Job Classification each Shift
- ❑ Diagram of Plant Layout & Illustration of Material Flow, and Process Flow diagrams
- ❑ Type & Name of Business Management & Information Systems Include Planned Enhancements
- ❑ Illustration of Information flow
- ❑ List of Current or Recent Productivity Improvement Actions and Status
- ❑ Identify / List Certifications & Business Achievements such as ISO 9000:2000 etc.
- ❑ Number of Facilities Included within Financial Reports _____
- ❑ List Number of Facilities by State Outside of California Included in the Financial Reports.
  _____

Table 4 Products Sold

Identify & Provide breakout of material by category and approximate sales by category.	Material Processed and Sold as Product					
	Revenue Contribution per Year (specify $ or % of Total Sales)					
Material Category	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Whole Tires						
Shred or Chips (Typical Size:)						
Ground Rubber (Typical Size)						
Manufactured Products (Please Itemize)						
TOTAL REVENUE per Year						

Table 5 Products Sold by Market Segment

Identify Target Market Segment or Customer by NAICS code & Portion of Sales for each Material Category. (Separate company Listing acceptable) Include prior 3 year Actual and 3 year Plan		Material Processed and Sold as Product					
		Revenue Contribution per Year (specify $ or % of Total Sales)					
Material Category	**Sold to, NAICS Code**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Whole Tires							
Shred or Chips							
Crumb							
Manufactured Item (Please Itemize)							
TOTAL REVENUE per Year							

California Integrated Waste Management Board

Tire-Derived Product Business Assistance Program

Contract #IWM05030

APPENDIX B
Resumes

JANUARY 2006

R·W·BECK

APPENDIX B

TEAM RESUMES

R. W. Beck, Inc.

Edward Boisson

Karl R. Hufnagel, P.E.

Robert W. Craggs

Kyle B. Rhorer

Jeffrey B. Lissack

Tony Georgis, P.E.

Elizabeth (Betsy) Dorn

Susan Bush

Cassandra M. Childs

Ronald A. Perkins, P.E.

Dr. Herbert M. Kosstrin

Corporation for Manufacturing Excellence (Manex)

Brent Meyers

Isidro (Izzy) Galicia

Michael Honeycutt

Bruce Macurda

David Vaughn

Will Dedman

California Manufacturing Technology Consulting (CMTC)

Scott Freauf

Geoff Downer

Saeed Madjidi

Enrique Mora

AMPros Corporation

Dan Hauschild

William Laxson

Riester-Robb Pacific, Inc.

Darryl Young

Tom Burnham

Mirja Peterson-Riester

Stacy Witkowski

Tom Ortega

Ben Dveirin

Laurie Godfrey

Troy Pottgen

D.J. Patternoster

Susan E. Watt

Anthony T. Piccini

Sierra Lake Group

Mike Tinney

The Carderock Group

Chris Schofield

Gary Huckabay

Richard Chow

Underwriter Laboratory

John Resing

Thomas Fabian

Pravinray Gandhi

Karen Dubiel

Daniel Steppan

Independent Consultant

Alan Moreland

Recycled Tire Engineering & Research Foundation

Gene Morris

George Way

Kamil Kaloush

Bottom Line Consulting

John Fearncombe

Innovative Distribution & Manufacturing LLC

Steve Branson

TL & Associates

Terry Leveille

R·W·BECK

Edward Boisson

Mr. Boisson has more than 18 years' experience in the private, government, and non-profit sectors within California and throughout the nation. He specializes in the management of environmental industry development, recycling market development, scrap tire management, product stewardship, facilitation, environmental and economic impact research, and environmental business development. Mr. Boisson's recent experience includes the preparation of a five-year scrap tire market analysis and strategic market development plan for the New York State Department of Economic Development. Mr. Boisson has designed and managed numerous large, complex projects involving the coordination of multiple team members and multiple clients. For example, for the Multi-Stakeholder Recovery Project in 2001 (sponsored by Businesses & Environmentalists Allied for Recycling), he secured active participation and support from over 35 beverage industry, recycling industry, government agencies and environmental organizations, coordinated a four-firm research team and facilitated written endorsement of a controversial analysis of beverage container recycling programs from a 14-member Task Force.

Prior to joining R. W. Beck, Mr. Boisson was Principal of Boisson & Associations (1998 – 2004), where he provided consulting services related to recycling market development, product stewardship, environmental and economic impact research, and environmental business development initiatives.

Mr. Boisson's past experience also included working as the executive director of the Northeast Recycling Council (NERC, 1994 – 1998). At NERC, Mr. Boisson managed a coalition of thirteen state environmental agencies dedicated to expanding the Northeast recycling industry, conducted regional and national research on recycling markets, and coordinated regional initiatives including three Recycling Investment Forums and the Recycling Economic Information Project.

Mr. Boisson's past experience also includes working at the California Integrated Waste Management Board (1990 – 1994). While employed at the Board, Mr. Boisson served successive periods as manager of the Board's Policy Office, manager of the Recycling Market Development Zone Loan Program, and Recycling Market Analyst.

Relevant Project Experience

Tire Market Assessment and Strategic Plan

New York State Department of Economic Development/New York

Assistant Project Manager. Mr. Boisson coordinated a team of more than 10 consultants, assessed current and potential markets for scrap tires generated in New York State, toured key facilities, and facilitated input from more than 80 New York scrap tire management firms and stakeholders. He then prepared a five-year scrap tire market analysis and

Humboldt State University

M.S. in Environmental Resources Engineering

University of California

B.A. in Physics, Minor in Politics

Licensing

Not Applicable

Tasks to Be Performed

- Program Management
- Work Plan
- Business Assessments
- Business Assistance
- Industry and Sector Wide Assistance
- Reporting

strategic market development plan for use by the New York State Department of Economic Development. This plan analyzed the technical, financial, institutional, regulatory, and perceptual barriers to develop recommendation on how the State can overcome these barriers, build market capacity, and address new market inefficiencies as they appear over time.

Electronics Recycling Cost Analysis

California Integrated Waste Management Board/Sacramento, California

Project Manager. Mr. Boisson is managing this current project to develop a cost reporting system for use in analyzing private and public electronics collection and processing operations. Mr. Boisson designed and coordinated a survey of more than 300 firms and government agencies, oversaw a literature review, and drafted cost reporting forms and a Guide to facilitate their use. The final stage of the project involves providing training to participating firms to facilitate their use of the forms to comply with regulations under the California Waste Electronics Recycling Act.

Regional Recycling Investment Forums

Various Clients/United States

Co-Project Manager. As Executive Director of the Northeast Recycling Council, and as Principal of Boisson & Associates, Mr. Boisson co-managed and provided technical assistance to three annual Northeast Recycling Investment Forums, the Midwest Recycling Investment Forum, and the Southwest Recycling Investment Forum. Mr. Boisson's role included:

- Recruiting and coordinating investment organizations as partners
- Recruiting and screening prospective recycling business participants
- Organizing and facilitating training sessions for selected recycling businesses seeking equity financing
- Overseeing the logistics of promoting and conducting the events

During these events, Mr. Boisson reviewed and critiqued the business plans of more than 80 recycling manufacturers. The Forums were highly successful. In the Northeast Forums alone, 43 firms made presentations before 93 potential investors, with at least 14 firms citing their experience as instrumental to their securing a combined total of over $20 million in equity capital. Clients included the Northeast Recycling Council, Mid-America Council of Recycling Officials, and the Southwest Public Recycling Associations.

Evaluation of Feedstock Conversion Opportunities in Massachusetts

Chelsea Center for Recycling Economic Development/Chelsea, Massachusetts

Project Manager. Mr. Boisson designed and conducted an evaluation of opportunities to encourage Massachusetts manufacturers to use recycled materials as raw material feedstock. Mr. Boisson developed economic, technical and market criteria for use in prioritizing opportunities. The project investigated ten separate feedstock conversion opportunities, including use of scrap tire shreds and chips in civil engineering projects, use of ground rubber in asphalt products, and use of ground rubber in molded products. In Phase 2 of the project, Mr. Boisson implemented a feedstock conversion program targeting use of shoddy (a cotton insulation material) by textile manufacturers in Massachusetts.

Recycling Industry Economic Information Research

Northeast Recycling Council and the US Environmental Protection Agency/Brattleboro, Vermont

Project Manager. As Executive Director of the Northeast Recycling Council, Mr. Boisson conceived, designed, and managed several projects to document and promote investment opportunities in the recycling industry.

- The Recycling Economic Information Study Final Report included a summary of all available sources of information on recycling industry firms, a recommended categorization scheme for the industry, and a recommended methodology for documenting basic industry statistics. The recommended methodology was subsequently implemented by R.W. Beck, on behalf of the Northeast Recycling Council, the National Recycling Coalition, and several states, yielding the first ever estimates of national recycling industry size.
- The Recycling Industry Financing Seminars program provided training to recycling firms in seeking investments. Partners included the Wharton School of Business.
- The Library of Recycling Industry Financial Transactions documented a number of investments in recycling firms and compiled select industry performance data.
- The Fostering Economic Development through Recycling project included development and deployment of a training curriculum for local economic developers to promote recycling industry opportunities.

California Glass Feedstock Conversion Project

California Department of Conservation/Sacramento, California

Project Manager. Mr. Boisson managed this project and coordinated a team including an engineer and several analysts, with the objective of promoting use of recycled glass by California brick, tile and artistic product producers. Mr. Boisson analyzed California glass markets, and oversaw research to identify and prioritize candidate firms for conversion to recycled feedstocks. Mr. Boisson managed and participated in site visits and other outreach to candidate firms, and facilitated discussions with potential suppliers. Mr. Boisson also oversaw a series of six training workshops designed to educate artisans and small-scale commercial art product producers about opportunities and benefits of using recycled glass as a raw material. The project is ongoing and has identified at least four brick and tile facilities that are actively considering use of recycled glass as raw material.

Expert Witness, Recycling Industry Finance

US Department of Justice, Tax Division/Washington DC

Recycling Industry Financial Analyst. Mr. Boisson evaluated the impacts of market volatility and competitive pressure on the cash flow needs of recycling collection and processing firms, to support the US Department of Justice in a case involving tax obligations of a particular firm.

Spire, Inc. Business Plan

South Providence Development Corporation/Providence, Rhode Island

Recycling Business Planning Consultant. Mr. Boisson researched markets and business opportunities involving a start-up manufacturer of high-end, recycled wood office furniture. He prepared pro forma financial statements and worked with the firm's principals to develop a business plan and recommendations on financing.

Recycling Entrepreneurship: Creating Local Markets for Recycled Materials

Gainer & Associates/Arcata, California

Project Co-Manager. Mr. Boisson researched and co-authored a landmark study of more than 40 business opportunities involving the manufacture of products from recycled materials in a rural, five-county region of California. He developed a model for local recycling economic development and prepared two business plans for potential ventures. The project provided early ground work for Fire & Light, a successful producer of high-end pressed glass products made with recycled glass.

Conversion Technology Environmental and Market Evaluation

Subcontractor to Research Triangle Institute/Raleigh, North Carolina

Manager, Stakeholder Input. As a subcontractor to Research Triangle Institute, for the California Integrated Waste Management Board, Mr. Boisson managed stakeholder input on a project that evaluated the life-cycle environmental impacts and the potential impacts on recycling markets of newly emerging conversion technologies, including gasification, acid hydrolysis, and catalytic cracking. Mr. Boisson organized and facilitated two workshops, compiled technical comments and suggestions, and provided critical review of draft work products. The results of the project contributed to the Board's legislative report on conversion technologies completed in 2005.

Multi-Stakeholder Recovery Project

Businesses and Environmentalists Allied for Recycling and Global Green USA/Pittsboro, NC

Project Manager. Mr. Boisson designed and managed a project that resulted in a consensus report documenting the comparative costs, performance, and environmental benefits of alternative beverage container recycling programs, including curbside programs and deposit-return programs. Mr. Boisson first secured the support and involvement of lead organizations in a task force that oversaw the project and endorsed the final report. He then recruited more than 25 firms to serve on an advisory committee, reviewing drafts and providing critical data and information. He managed a four-firm research consulting team and contributed substantial research services. The project resulted in the unanimous endorsement of a highly controversial analysis by such firms and organizations as Coca-Cola North America, Southeast Container, Puretech Plastics, Waste Management, Inc., the Container Recycling Institute, the Grassroots Recycling Network, Global Green USA, and the Minnesota Office of Environmental Assistance.

Connecticut Statewide Solid Waste Management Plan

Connecticut Department of Environmental Protection

Recycling Strategist. Mr. Boisson assisted in the research and preparation of the Connecticut State Solid Waste Management Plan. This plan had an emphasis on significantly expanding source reduction and recycling levels. Mr. Boisson facilitated stakeholder involvement and lead analysis of waste diversion opportunities. The draft plan is currently in review by Connecticut Department of Environmental Protection staff and will go through a public review process in early 2006.

Karl R. Hufnagel, P.E.

Mr. Hufnagel is a civil engineer with more than 35 years of experience specializing in managing large project teams for major solid waste facility siting, planning, environmental review, design, and construction projects with budgets in excess of $25 million. Mr. Hufnagel is also experienced in defining design criteria, estimating costs, scheduling, and implementing methods to control project budgets. His background includes the technical review of major state-of-the-art facilities throughout the United States.

Relevant Project Experience

On-Call Solid Waste Planning and Civil Engineering

King County, Washington

Project Manager. Mr. Hufnagel is currently managing a three year, on-call solid waste planning engineering services agreement for the Solid Waste Division. This is the third consecutive three year on-call contract with the County. King County currently disposes of over 1,000,000 tons of MSW each year at their Cedar Hills Landfill. The landfill is slated to close around 2015. Mr. Hufnagel is managing a team of 16 subconsultants for this project. The primary focus of the contracted services is to provide support to the county staff in developing a waste export plan and preliminary planning for upgrades to their existing eight transfer stations and development of new facilities, including transfer stations and a truck-to-rail intermodal facility. In addition, services will include support for an update of the county's integrated solid waste management plan.

Airport Road Recycling and Transfer Station

Snohomish County Solid Waste Management Division/Washington

Project Manager. Mr. Hufnagel was the project manager for this $22 million project for the siting, environmental review, conceptual and detailed design, permitting, and construction of a 1,500-tpd solid waste transfer station and recycling facility. He managed the 10-firm team of consultants whose efforts resulted in the October 2003 opening of this world-class facility. The transfer facility included two of the latest preload compactors for MSW and a top-load bay that is used for yard waste and hard-to-handle waste as emergency backup for the compactors. Under Mr. Hufnagel's management, the team was able to deliver the completed ARTS facility in 37 months.

Regional Solid Waste Transfer and Disposal System Competitiveness Evaluation

Confidential Client/New York

Project Manager. Mr. Hufnagel is currently managing the conceptualization and development of cost and financial models for various sizes of a regional transfer facility and hauling and disposal

University of Idaho
B.S. in Civil Engineering

Licensing
Registered Professional Engineer

Tasks to Be Performed

- Assistant Program Management

R·W·BECK

system in a large metropolitan area in New York State. Mr. Hufnagel conceptualized a new transfer facility with capacity options ranging from 500 to 1,500-tpd using top-load and stationary pre-compaction transfer technologies. Based on the conceptualized system, he developed a detailed cost model for capital and operation and maintenance costs for each combination of transfer station size, transfer technology, and disposal point (24 different model options). Each model looked at all possible cost elements. Detailed user guides were developed for both the cost and financial models.

Snohomish County On-Call Solid Waste Civil Engineering

Snohomish County, Washington

Project Manager. Mr. Hufnagel is currently managing the third of three consecutive on-call engineering services agreements, totaling eight years, for the Snohomish County Solid Waste Management Division. Services for 35 separate projects provided to date cover a wide range of facility feasibility, conceptual planning, design, and rehabilitation projects including the following representative project work:

- Concrete repairs to the top of the waste pit walls at the Southwest Recycling and Transfer Station
- Structural, mechanical, and electrical modifications to the Everett Recycling and Transfer Station to retrofit preload type solid waste compactor
- Retrofitting the North County Recycling and Transfer Station with a knuckleboom refuse crane
- Feasibility study for a new 1,200 tpd intermodal recycling and transfer station to replace the Everett Recycling and Transfer Station
- Design, assistance with environmental review and permitting, and construction management assistance for a 700-tpd temporary recycling and transfer station located at the Cathcart Landfill site

Mr. Hufnagel will continue to manage an additional two year extension of the on-call contract through 2008.

Skagit County Resource Recovery Facility Audit

Skagit County and Wright Schuchart Harbor Company/Washington

Project Engineer. Mr. Hufnagel was a technical lead in the physical inspections and preparation of a report to document the existing condition of this privately owned and operated waste-to-energy facility. After two years of continual operation, the ownership of the facility was being transferred to Skagit County. Mr. Hufnagel is currently providing a technical audit to both the County and the Wright Schuchart Harbor Company, Mr. Hufnagel verified the condition of the facility's equipment, structures, inventory, and ancillary systems, and made recommendations for repairs.

Victor Valley Materials Recovery Facility

Mojave Desert and Mountain Solid Waste Authority/California

Technical Reviewer. Mr. Hufnagel assessed the technical feasibility of this proposed, 1,000-tpd materials recovery facility for the municipalities that financed its development. He reviewed the developer's technical proposal for potential performance and operations problems and analyzed the $24.6 million construction cost estimate for reasonableness.

Robert W. Craggs

Mr. Craggs specializes in recycling and integrated solid waste systems analysis, emphasizing a business planning perspective while assisting private industry and local, regional, and state governmental organizations with their solid waste management needs. To promote practical solutions, he has directed several studies to document program baselines, analyze system cost and performance and develop optimization strategies. These evaluations include review of services including collection, processing and markets. Evaluation components typically include management, financial, and operations reviews; specific program recommendations; and implementation of improvements.

Relevant Project Experience

Solid Waste Efficiency Study

Minneapolis, Minnesota

Mr. Craggs performed an evaluation of the City's collection (solid waste and recycling) services and recommendations for program improvements.

Needs Assessment and Rate Study

Brentwood, California

Mr. Craggs Evaluated the City's solid waste, yard waste, and recyclable materials collection and transfer program. He also provided recommendations for program improvement.

Bulk Waste Efficiency Study

Phoenix, Arizona

Mr. Craggs evaluated the City's bulk waste collection program and its use of equipment, staffing, scheduling and overall program parameters. Benchmarked other municipalities' bulk waste collection programs as part of this study.

Solid Waste Efficiency Study

Phoenix, Arizona

Mr. Craggs evaluated of the city's collection (solid waste, bulky, yardwaste, and recycling) and disposal services. He also assisted the City with implementation of program improvements.

Solid Waste Assessment Privatization

Dallas, Texas

Evaluation of the City's Sanitation Services landfill disposal program, business model review, and procurement of privatization options.

Augustana College

B.A. in Political Science and Public Administration, Cum Laude

University of Iowa

M.A. in Urban and Regional Planning
Emphasis: Environmental Policy and Planning

University of Iowa

Juris Doctorate

Licensing

Not Applicable

Tasks to Be Performed

- QA/QC

R·W·BECK

System Evaluation and Alternative Funding Study

Horry County Solid Waste Authority, South Carolina

Mr. Craggs assisted in conducting a comprehensive review of financing alternatives and options for funding, the Authority's programs and facilities to ensure sufficient funds are available over the long term.

R. W. Beck conducted project briefings with key stakeholders and reviewed the existing financing structure and assessed its adequacy and sustainability in meeting the Authority's long-term plans and objectives. Several options were identified and evaluated. R. W. Beck conducted a workshop at the completion of the initial evaluation to further discuss the options with stakeholders in preparation for presenting a recommendation to County Council.

Materials Recovery Facility (MRF) Options

McLeod County, Minnesota.

Senior Technical Lead. Mr. Craggs assisted the County in planning, designing, and procuring a recyclable materials processing and marketing facility. He assisted with an initial feasibility study to project the quantities and types of recyclable materials to be collected and transported within the County for processing. Based on the feasibility study, R. W. Beck led several workshops with the County Board of Commissioners and Solid Waste Advisory Committee to address recycling and planning issues critical to moving forward with the development of a MRF.

Materials Recovery Market Development

Mr. Craggs has directed several studies evaluating the potential markets for recyclable, compostable, and combustible materials. These studies typically include gathering data via survey instruments, evaluating materials supply and demand, and developing recommendations as to market development. Provided below are some examples of these projects.

- Economic Impacts of Recycling - Recycle Iowa Program. Assisted in a landmark study and a subsequent update which measures the economic impacts of recycling activities in the State of Iowa.
- Northeast Minnesota Compost Markets Feasibility Study - Western Lake Superior Sanitary District and St. Louis County, Minnesota. Evaluated the potential of both primary and secondary markets (i.e. mineland reclamation, reforestation, nurseries) for municipal solid waste compost in Northeast Minnesota.

Kyle B. Rhorer

Kyle Rhorer specializes in the areas of strategic planning, capital financing, financial management and controls, and the development of public-private partnerships for utility infrastructure. Mr. Rhorer also has more than 16 years of experience marketing to municipalities, regulatory agencies, solid waste utilities, publicly- and privately-owned drinking water, wastewater, and other environmental services providers.

He provides business consulting services concerning innovative opportunities for clients, including revenue enhancement strategies; capital and operating cost optimization; conventional and alternative service delivery approaches and other analyses concerning the current and future competitive role within regional solid waste services markets. He also manages performance assessments for both public and private clients to identify potential alternatives to achieve cost reductions while maintaining or improving the current level of service provided.

Relevant Project Experience

Utility Performance Audit

Santa Clara Valley Water District/San Jose, California

Project Manager. Mr. Rhorer managed this comprehensive review of the District's water utility. The scope included a review of operations, the capital improvements program, water quality, the public/government relations program, and the financial management and business operators of the utility. The audit produced a series of practical recommendations, many of which the District is now implementing. Recommendations included a cost-of-service study; implementation of performance measures; and organizational realignment. He also led the financial performance assessment task, made recommendations to improve the District's fiscal management programs and capital planning functions.

Logistics and Financial Advisory Team

County of Sacramento, Department of Waste Management and Recycling/California

Client Advisor. Mr. Rhorer served on a four-person advisory team to provide long-term strategic and financial planning and guidance to the Director of the Department of Waste Management and the Sacramento County Board of Supervisors. He provided analysis and direction concerning innovative opportunities for the Department, including revenue enhancement strategies; capital and operating cost optimization; conventional and alternative service delivery approaches and other analyses concerning the current and future competitive role of Sacramento County in the northern California solid waste services market.

University of California, Davis
MBA Environmental and Natural Resources Management

University of California, San Diego
BA in Quantitative Economics

Licensing
Not Applicable

Tasks to Be Performed

- QA/QC, Resource Allocation

R·W·BECK

Biosolids Recycling Facility DBOO Procurement

Sacramento Regional County Sanitation District/California

Project Manager. Mr. Rhorer managed the procurement process for the Sacramento Regional County Sanitation District (SRCSD) for the design, construction, ownership and long-term operation of a biosolids recycling facility. In this capacity, he managed the procurement strategy development, process, developing a design-build-own-operate (DBOO) approach that will minimize District risk. Mr. Rhorer managed the development of all bidding documents and designed and led the proposal evaluation process. He assisted SRCSD in developing a long-term management plan based on per-unit costs of solids treatment alternatives and successfully negotiated a 20-year DBOO service agreement.

Performance Assessment

City of Midland, Texas

Project Manager. Mr. Rhorer managed a performance assessment of the City's Water and Wastewater Utility to identify potential alternatives to achieve cost reductions while maintaining or improving the current level of service provided by the Utility. Based on the results of the assessment, alternative service delivery opportunities for the City were evaluated. These alternatives include contract operations of all or some of the existing facilities; DBOF contracts for new capital facilities; outsourcing of selected management or administrative functions such as utility billing and customer service; sale of selected Utility assets or systems; or sale of the entire Utility system.

CIP Strategic Business Plan

San Francisco Public Utilities Commission/ California

Project Manager. Mr. Rhorer managed a high-level engagement to develop an overall strategy for SFPUC's implementation of a $4-billion capital improvement program. Mr. Rhorer also served as key architect of the utility-wide planning process to develop a new organizational design and associated mission, vision and performance measures against which the large utility will evaluate the feasibility of implementing the largest CIP in the history of San Francisco. In addition to all day-to-day project management responsibilities, he developed an overall directional plan and strategy to involve all SFPUC stakeholders including customers, management, staff, and elected officials.

Strategic Planning Assistance

Municipal Water District of Orange County/California

Project Manager. Mr. Rorer oversaw this comprehensive review of the District's water utility. The scope included a review of operations, the capital improvements program, water quality, the public/government relations program, and the financial management and business operators of the utility. The audit produced a series of practical recommendations, many of which the District is now implementing. Recommendations included; a cost-of-service study, implementation of performance measures, and organizational realignment. He also led the financial performance assessment task, as well as made recommendations to improve the District's fiscal management programs and capital planning functions.

California AB 939 Quality Assurance

Alameda County Waste Management Authority (ACWMA)/ California

Project Manager. Mr. Rhorer managed a project with ACWMA to determine the sufficiency and accuracy of solid waste management data provided to ACWMA from its member agencies. The purpose of this engagement was to ensure that Alameda County jurisdictions are in compliance with the solid

waste diversion goals of California AB 939 and was progressing towards meeting the diversion goals established by ACWMA. Additionally, he oversaw the preparation of quarterly reports submitted by ACWMA to the California Integrated Waste Management Board.

Procurement of Design-Build-Operate (DBO) Services

City of Woonsocket, Rhode Island

Mr. Rhorer worked with the City to develop a public-private partnership strategy, including a long-term analysis of capital financing options and user rate impacts. He led the financial review of proposal finalists for the long-term DBO engagement and developed a cost-risk methodology to determine the financial implications of various risk allocations. Mr. Rhorer determined the ability of the proposers to provide financial considerations and competitive service fees, while maintaining a stable and affordable user-rate structure.

Analysis of Consolidation of Three Water Production Systems

Cities of Bryan & College Station and Texas A & M University/College Station, Texas

Project Manager. Mr. Rhorer managed strategic planning and consulting services to the cities of Bryan and College Station and Texas A&M University as the three drinking water utilities considered consolidating their water production infrastructure. Specifically, this engagement involved the identification and assessment of all water production assets throughout the three utility service areas, resulting in a comprehensive inventory and relative valuation for each contributing entity. Additionally, the project involved the development of a proposed organizational structure and user rate schedule for the consolidated utility, which will take advantage of the economy of scale inefficiencies the proposed merger would provide.

Landfill Financial Feasibility Study

University of California, Davis

Project Analyst. Mr. Rhorer performed a comprehensive economic modeling analysis to compare a variety of disposal alternatives with the University's proposed landfill expansion. He assisted the University by modeling the costs of each disposal alternative over the proposed project period. This analysis yielded information, such as the annual cost of each disposal alternative, the corresponding tipping fees and service fees on a per-ton basis for each option, and the present value of each multiyear alternative based on a discounted cash flow analysis. Sensitive analyses were performed to identify the impacts of changes in tonnage, operating costs, etc. Once the financial analysis was completed, the disposal alternatives were ranked and compared to the University's landfill expansion option.

Solid Waste Program Strategic Planning and Procurement Services

City of Citrus Heights, California

Project Manager. Mr. Rhorer managed a comprehensive solid waste services procurement process, on behalf of the City of Citrus Heights, to award a long-term exclusive residential franchise service agreement. He was responsible for the development of the procurement strategy; financial strategy; public education efforts; the preparation of all procurement documents, the development of selection criteria; the construction of the services agreement document; and the review and evaluation of the proposers' submittals. He also assisted the City in negotiating a long-term service agreement between the City and its selected contractor, while performing financial analyses to determine the long-term fiscal impacts of the public/private partnership.

Comparative Landfill Economic Feasibility Study

Confidential Client/ California

Project Manager. Mr. Rhorer managed the evaluation of the long-term financial feasibility of a proposed municipal solid waste (MSW) landfill in northern California. This project involved the construction of a comprehensive revenue-cost model that will be used to measure the profitability of the landfill over the facility's life. Mr. Rhorer also managed the research process to support the assumptions of this analysis, including a comprehensive review of all available MSW disposal options in northern California, their associated direct and indirect costs, and the availability of capacity of each facility. To further support this project, he led a market assessment analysis.

Privatization of Commercial Recycling Program

City of Pleasanton, California

Program Manager. Mr. Rhorer assisted the City of Pleasanton in developing and implementing a comprehensive commercial recycling program to be provided by the City's private-sector waste hauler under a long-term agreement. He worked closely with the City to ensure the program included a number of financial and legal considerations to protect the City's interests while providing enhanced services to the commercial customers.

Jeffrey B. Lissack

Mr. Lissack has been working as an R. W. Beck contract employee since September 2005. He brings a unique mixture of experience, having worked as a management consultant, as an executive for small expanding businesses, and as a state government official developing recycling markets.

For the past three years, Mr. Lissack has worked as a freelance management consultant. Many of these projects have involved both strategic planning and tactical implementation across a range of businesses, including:

- Representing a $500K per year sports interactive media company in its negotiations to be acquired by a much larger company. Mr. Lissack's roles have included leading the negotiations, defining the sales pitch, refining the financial model to come up with reasonable valuation levels, and getting the company's employee owners to sign an agreement not to independently go to work for the potential acquirer.
- Helping refine the business plan and investor presentation for a start-up company planning to build "green" modular housing, helping them win awards and follow-up investor interest at two investor forums.
- Writing a business plan and building the financial model to enable a non-profit focused on sustainable agriculture to decide to acquire a working farm to raise and market grass-fed beef.
- Helping an environmental consulting firm evaluate and prioritize a number of product development initiatives.
- Serving on an international team of independent evaluators judging the viability of business plans submitted to ICANN (the non-profit that oversees the Internet addressing system) to create new top level domain names to expand the Internet.

During this same time period, Mr. Lissack worked on a number of recycling-related consulting projects, including:

- Leading workshops to facilitate public input into a study for CIWMB to assess the likely impacts of permitting emerging technologies capable of creating fuel and electricity from municipal wastestreams.
- Interviewing a broad range of industry players and drafting an action plan for a Washington State environmental agency to hold a forum with players from all parts of the value chain to increase recycling of carpet in the Pacific Northwest.

Mr. Lissack also has experience working as a business development and operations executive for several early stage technology companies, where his accomplishments included securing the first strategic partnerships for a biotech (Nanoplex Technologies) developing its first non-life science related markets for its patented technology; rationalizing

Yale School of Management
Master's degree in Public and Private Management

Williams College
B.A. in Political Science, Magna Cum Laude

Licensing
Not Applicable

Task to Be Performed
- Co-Lead for Business Assessments and Business Assistance
- Industry and Sector Wide Assistance

product development and leading an asset sale enabling an Internet company focused on the higher education market (Knowledge Ventures) to survive an industry downturn; and taking an Internet company focused on the automotive market (The Cobalt Group) public, growing annual revenues from $1 million to $40 million, and managing organizational change stemming from growing staff from 30 to 550 and the customer base from 1000 to 10,000 business clients.

Mr. Lissack spent the first phase of his career in Massachusetts state government. From 1990 to 1997, he served as the Director of Recycling Market Development for the Massachusetts Department of Environmental Protection. His accomplishments there included creating a multi-million dollar loan fund to assist recycling-related manufacturers, working with the state's industrial extension service to provide assistance to dozens of recycling businesses, boosting state purchases of recycled products from $3 million to $27 million, and creating a program to assist businesses in buying recycled products (winner of a 1996 National Recycling Coalition Award for best state program). During this time, Mr. Lissack also served first as Vice-Chair and then Chair of the Northeast Recycling Council, where he negotiated voluntary agreements with publishers to spur demand for recycled paper and partnered with Ed Boisson to launch a series of recycling investment forums to spur increased investment in recycling. From 1989 to 1990, Mr. Lissack was an assistant to the Executive Director of the Massachusetts Water Resources Authority, where he served as a liaison to investment banks, law firms, and rating agencies for the first $836 million bond deal to finance the clean-up of Boston Harbor. Earlier, Mr. Lissack spent four years consulting to electric utilities, regulators, and trade associations with Temple, Barker, and Sloane (now part of Mercer Management Consulting).

Tony Georgis, P.E.

Mr. Georgis is an engineering and economic analyst experienced providing financial analyses, cost of service and rate analysis, system efficiency evaluations, strategic planning studies, procurements, asset evaluation, market research, and appraisals.

Mr. Georgis assists in developing and reviewing financial models to determine projected revenue and costs associated with various projects, support revenue bond financing for utilities, and financing for commercial bank financings of privately developed projects. He develops cost/benefit studies, reviews pro forma financial models for technical and economic feasibility, and supports cost of service studies.

Relevant Project Experience

Financial Analysis for Solid Waste Programs

El Paso County, Texas

Project Analyst. Mr. Georgis conducted financial analysis of solid waste programs including support of municipal solid waste rate analysis and studies; evaluated solid waste program operations and identified opportunities for improvement; analyzed costs/benefits of multiple solid waste recycling collection programs and impact on rates; researched and evaluated best management practices

Risk Management and Assessment

American Savings Bank/Reno, Nevada

Project Manager. Mr. Georgis performed risk management and assessment for Commercial Lender in a construction development project; reviewed contracts, costs, scope, construction documents for possible risks to the lender.

Energy Use and Cost Study

Sheridan School District/Sheridan, Colorado

Project Analyst. Mr. Georgis analyzed school district's facilities' energy use and associated costs; inspected existing building and systems conditions, proposed projects to reduce energy use and costs, estimated costs and savings associated with projects, performed cost/benefit analysis of each project to recommend a plan to reduce energy use and costs with an appropriate funding vehicle (bonds, contractor financed, state grants, etc).

Cost-of-Service and Rate Design

Confidential Client, Texas

Project Analyst. Mr. Georgis assisted in cost of service analysis and rate design for municipal electrical utility in Texas.

Texas A&M University
MBA, Finance Specialization

Texas A&M University
B.S. in Mechanical Engineering

Licensing
Not Applicable

Tasks to Be Performed

- Data Coordination and Verification for Business Assessments

R·W·BECK

Elizabeth (Betsy) Dorn

University of NC at Chapel Hill
M.S. in Public Health, Environmental Sciences, and Engineering

Licensing
Not Applicable

Tasks to Be Performed

- Co-Lead for Industry and Sector Wide Assistance

Ms. Dorn has 20 years of solid waste and market development experience and is recognized as a leading expert on recycling market development. She provides public and private sector clients with strategic planning, supply/demand analyses, materials sourcing, funding and economic analyses, public outreach, and other related services. Ms. Dorn also provides consultant services related to plan development, operational evaluations, launching new programs, developing new or expanded markets, and training solid waste and recycling professionals.

Most recently, Ms. Dorn served as project manager on the New York Scrap Tire Market Assessment and Strategic Business Plan and has been working with the Commonwealth of Pennsylvania Department of Environmental Protection on the development and implementation of a Statewide Recycling Market Development Center. Ms. Dorn has provided similar services in strategic planning for recycling market development of Massachusetts, Texas, and North Carolina.

Prior to becoming a consultant, Ms. Dorn managed Mecklenburg County, North Carolina's Recycling Division with a 21 person staff and an operating budget of more than $1 million. Operations under her purview included a multi-material curbside recycling and drop-off center program, wood and yard waste composting and mulch production, office paper collection, county-wide promotion of recycling, and marketing of all recovered materials.

Relevant Project Experience

Recycling Market Development

Ms. Dorn has assessed the relationship between secondary materials supply and demand, evaluated recycling business development opportunities, and prepared strategy recommendations and plans for developing new or expanded markets for recyclable materials for communities and state governments.

Tire Market Assessment and Strategic Plan

New York Department of Economic Development/New York

Project Manager. Ms. Dorn analyzed the disposition and markets for both stockpiled and annually generated tires originating in New York. She also managed private market development and helped promote the use of recycled tire products.

Recycling Markets Center Project

Pennsylvania Department of Environmental Protection/Pennsylvania

Project Manager. Ms. Dorn managed the assessment of recyclable materials supply and demand. She analyzed recycling market development needs, barriers and opportunities, and developed a comprehensive strategic for recycling market development in

Pennsylvania. She also managed the development of a business plan for the creation of a statewide recycling market development center.

Evaluation of Arizona Recycling Market Development Program

State of Arizona/Phoenix, Arizona

Task Leader. Ms. Dorn reviewed the State's recycling market development program mission, staffing, and accomplishments to date. She led interviews with stakeholders to determine perceptions regarding recycling market development needs and state's approach to addressing them. Ms. Dorn also led the preparation of letter report documenting evaluation results and recommendations for improving the State's recycling market development program.

Strategic Recycling Market Development Plan

Chelsea Center for Recycling and Economic Development on behalf of Commonwealth of Massachusetts/Massachusetts

Project Manager. Ms. Dorn managed the assessment of the supply and demand of eight recycling commodities. She also led the evaluation of recycling market development opportunities, the development of a comprehensive strategic plan to create the institutional and programmatic structure in Massachusetts for addressing current and future recycling market development needs and opportunities.

Strategic Planning

U.S. Environmental Protection Agency

Task Leader. Ms. Dorn led the assessment of needs and opportunities for the U.S. EPA Jobs Through Recycling Program to better assist state recycling market development interests. This project included the completion of a survey of state recycling market development program managers to determine their perspectives regarding key barriers and opportunities for overcoming them.

Community Recycling Market Development Study

Salvaging Rhode Island's Future Partnership/Rhode Island

Task Leader. Ms. Dorn led the exploration of recycling market development opportunities, with particular emphasis on community-based approaches for implementation in Rhode Island.

Strategic Recycling Market Development Plan

Texas Natural Resource Conservation Commission (TNRCC)/Texas

Task Leader. Ms. Dorn led a detailed markets assessment and preparation of a comprehensive statewide recycling market development strategic plan for the State of Texas.

Strategic Plan for Recycling Market Development

North Carolina Department of Commerce

Task Leader. Ms. Dorn led the assessment of recyclable materials supply and demand and preparation of strategic plan for the development of recyclable materials markets for the State of North Carolina.

Two-Year Operational Plan

Chelsea Center for Recycling & Economic Development/Massachusetts

Project Manager. Ms. Dorn provided facilitation of a two-day planning retreat and development of two-year work plan for the Chelsea Center, a nonprofit university-affiliated recycling market development organization in Massachusetts.

Community Recycling Market Development Study

City of Taunton, Massachusetts

Task Leader. Ms. Dorn surveyed regional businesses to identify recycling business development opportunities. She also provided recommendations on how to realize the identified opportunities as well as make use of other findings resulting from the study.

Recycling Program Development and Evaluation

Ms. Dorn works with cities and counties to evaluate their existing recycling programs and identify potential changes to improve the performance and cost-effectiveness of services being offered. In addition, she has developed implementation plans for new recycling services, assessed recyclable materials markets, and provided guidance on recycling service procurement, contract development, and contract administration.

PET Bottle Supply and Demand Assessment

South Carolina Department of Health & Environmental Control and Clemson University/South Carolina

Project Manager. Ms. Dorn managed the assessment of PET bottle supply and demand and development of recommendations for increasing PET recycling in South Carolina.

Construction and Demolition Debris Recycling Feasibility Study

North Carolina Department of Environment, Health and Natural Resources/North Carolina

Project Director. Ms. Dorn directed the evaluation of construction and demolition (C&D) debris generation and disposal practices, recycling options, and recycling market development opportunities for four North Carolina counties.

State Recycling Program Implementation Assistance

Texas Natural Resource Conservation Commission (TNRCC)/Texas

Project Manager. Ms. Dorn provided technical assistance to eight communities in establishing comprehensive waste reduction and recycling programs; guidance to TNRCC in developing its Clean Cities 2000 Program.

Task Leader. Ms. Dorn led the evaluation of state buy-recycling programs and development of buy recycling program recommendations for Texas.

Facilitation, Consensus Building, and Training

Ms. Dorn has facilitated complex strategic planning processes involving multiple stakeholders and has trained hundreds of recycling and solid waste professionals on behalf of various states and professional associations, including North Carolina and South Carolina, Texas, the National Recycling Coalition, SWANA, and the U.S. EPA.

Funding Study (underway)

Horry County Solid Waste Authority, South Carolina

Project Manager/Client Liaison. Ms. Dorn conducted stakeholder meetings, interviews and surveys to gather stakeholder input and build consensus regarding a funding plan for the Authority's solid waste management programs and services. She provided a review of financing alternatives to ensure sufficient funds are available to finance the Authority's programs and facilities over the long term.

Recycling Coordinator Training Course

Texas Natural Resource Conservation Commission (TNRCC)/Texas

Project Manager. Ms. Dorn managed the design, lead instruction, and provided educational tools development for of the Texas Training Course on Municipal Waste Reduction, a three-day training program for recycling coordinators held in three Texas locations.

Recycling Commodity Workshop

Moore & Associates/Atlanta, Georgia

Task Leader. Ms. Dorn co-led the conduction of a half-day workshop on plastics and paper recycling, in cooperation with the National Association of Plastic Container Recovery.

Materials Marketing Workshop

North Carolina Department of Commerce/North Carolina

Task Leader. Ms. Dorn led the development and conduction of a one-day workshop on marketing recyclable materials, held in six North Carolina locations.

Susan Bush

Ms. Bush has 11 years of experience in research and analysis specializing in the recyclable materials market development and other environmental issues. She has a strong background in data collection from both primary and secondary sources. Ms. Bush is experienced in all aspects of research projects including the development of survey instruments, telephone interviews, and facilitation of public involvement sessions and focus groups.

Ms. Bush is a skilled technical writer and has authored numerous reports, manuals, and articles for trade publications.

Relevant Experience

Tire Market Assessment and Strategic Plan

New York Department of Economic Development/New York

Project Consultant. Ms. Bush assisted in the analysis of the disposition and markets for both stockpiled and annually generated tires originating in New York. She also assisted with private market development, and promoted the use of recycled tire products.

Recycling Markets Center Study

Pennsylvania Department of Environmental Protection, Pennsylvania

Project Consultant. Ms. Bush researched the state of recyclables marketing in Pennsylvania. She analyzed which materials were being disposed that had the potential for recovery, as well as substantial gaps in the processing infrastructure that impeded the movement of materials into the marketplace. Regional differences were also examined. In addition, the state database of materials processors was updated. Ms. Bush also interviewed representatives of various organizations involved in recycling and market development issues, and developed an understanding of the roles these organizations play in market development.

MRF Efficiency Studies

Ohio Department of Natural Resources, Ohio

Project Analyst. Ms. Bush analyzed the processing efficiency of three material recovery facilities (MRFs) for the State of Ohio's grant application process. Information from site visits was analyzed, as well as data gathered directly from MRF managers. A MRF efficiency model was utilized to evaluate the extent to which each commodity type was sorted efficiently. Capital and operating costs were analyzed, and recommendations were made to help the facilities operate more efficiently. Ms. Bush also conducted a site visit at one of the facilities.

University of Rhode Island
M.S. in Resource Economics

Wake Forest University
B.A. in Economics

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance

Recyclable Materials Marketing Plan

Hamilton County, Ohio

Project Analyst. Ms. Bush analyzed recyclable materials markets in Hamilton County and estimated materials being landfilled. Based on her analysis, Ms. Bush recommended materials that the County should focus their market development activities on. Materials markets considered included glass, tires, organics, plastics, fiber, wood and other organics, textiles, and metals.

Market Research and Development

Confidential Client

Project Consultant. Ms. Bush studied non-ferrous metal markets including current status, market prices, volatility of markets, factors expected to affect the supply and demand for these secondary materials. She gathered and analyzed cost, price data, researched metal processing/refining company financial records, analyzed world events, and estimated U.S. market share for non-ferrous secondary metals.

Benchmarking Solid Waste Services

County Utilities Commission/Winston-Salem, North Carolina

Project Manager. Ms. Bush managed this benchmarking study of CCUC-provided solid waste management services. The goal of the benchmarking project was to obtain key benchmark statistics to evaluate the efficiency of CCUC's programs and services. CCUC facilities and programs evaluated included: MSW disposal at the Hanes Mill Road Landfill; C&D disposal at the Old Salisbury Road Landfill; Yard waste composting and processing at the Reynolds Park Road and Overdale Yard Waste Facilities; Household hazardous waste (HHW) collection/management program; and Recycling drop off programs.

Solid Waste Management Plan Builder Instructional Guide

Georgia Department of Community Affairs, Georgia

Project Consultant. Ms. Bush assisted the Georgia Department of Community Affairs (GADCA) in developing and implementing an online, interactive solid waste planning tool, the Solid Waste Plan Builder (SWPB). SWPB is a tool that local governments can use to prepare and submit their state required solid waste management plans to the GADCA for review and approval.

Solid Waste Management Plan Update

Chester County, Pennsylvania

Project Consultant. Ms. Bush helped Chester County, Pennsylvania update their solid waste management plan. The County was particularly interested in types of industries and institutions to target to enhance their recycling. Ms. Bush researched entities by SIC code, focusing on the largest employers. The County was provided with critical information to prioritize their commercial recycling efforts.

Solid Waste Management Plan Update

McKean County, Pennsylvania

Project Consultant. Ms. Bush also assisted with a solid waste management plan update for McKean County, Pennsylvania. This County was also interested in enhancing recycling in their commercial/industrial sectors. Ms. Bush was able to provide the County with a list of major commercial establishments by SIC code to help the County prioritize the sectors they should focus on for cost-effective results.

Solid Waste Management Plan

City of Cincinnati, Ohio

Project Consultant. Ms. Bush conducted research for multiple areas of this comprehensive master planning effort including:

- **Automated Collection:** Ms. Bush researched communities using automated refuse and or recyclables collection. She developed a questionnaire to solicit information from municipal officials. She also analyzed results, quantifying where possible, the recommendations of municipalities that have implemented automation. Information solicited included motivating factors for implementing automated collection, increases/decreases in cost due to implementing automation, changes in productivity, and recommendations to communities considering implementing automated collection.
- **Automated Collection Equipment:** Ms. Bush researched automation equipment, including carts, automated collection vehicles, and cart tippers. She met with some equipment manufacturers for product demonstrations, toured a cart manufacturing facility, and interviewed several equipment representatives, as well as users of the equipment. She developed product comparison grids so the client could compare features of available products at a glance.
- **Alternative Fuels:** Ms. Bush researched the feasibility of alternative fuels for use in refuse collection vehicles. She found examples of such use, and analyzed the advantages and disadvantages of using alternative fuels for heavy on-road uses.

Solid Waste Management Plan

Sarasota County, Florida

Project Consultant. Ms. Bush conducted research for multiple areas of this comprehensive master planning effort including:

- **Collection:** Ms. Bush updated research regarding automated collection. She developed case studies of communities using different types of collection methods, including automated, split-cart, and semi-automated collection.
- **Processing:** Ms. Bush researched single-stream recyclables processing programs extensively to gain insights about the benefits and challenges associated with single stream collection and processing of recyclable materials. She interviewed various stakeholders including municipal leaders, MRF managers, hauling representatives, and processing equipment representatives.
- **Electronics Recycling Programs:** Ms. Bush researched and developed case studies of municipal electronics recycling programs. Her research included collection events, permanent drop off locations, and curbside collection programs. She analyzed the benefits and disadvantages associated with each type of collection program. Ms. Bush also interviewed program managers to gain insights and recommendations for communities considering implementing or expanding their electronics recycling program.
- **Mandatory Recycling:** Ms. Bush researched communities that have mandatory recycling for residents and/or commercial entities. She interviewed municipal leaders to understand if and how these mandates are enforced. Ms. Bush also analyzed the effectiveness of various types of mandates and enforcement tools.

Cassandra M. Childs

Ms. Childs has more than 18 years of experience in the private, government, and non-profit sectors specializing in the analysis and implementation of policies, programs, and facilitated agreements designed to expand the materials recycling industry. She is also experienced in waste composition analysis, material recovery program design, and solid waste management systems optimization. In addition, Ms. Childs is frequently involved in public speaking and presentations.

Ms. Childs launched her recycling career as a Recycling Manager with Southeastern Container, Inc., specializing in the development and management of multi-material recycling for manufacturing operations and operation of a plastic bottle recycling center.

Relevant Experience

Tires Market Assessment and Strategic Plan

New York Department of Economic Development/New York

Consultant. Ms. Childs analyzed the disposition and markets for both stockpiled and annually generated tires originating in New York. She also assisted with private market development forecasting and technical write-up of current markets for tire-derived products.

MRF Benchmarking Study

Mecklenburg County, North Carolina

Consultant. Ms. Childs provided a comparison of the operational parameters and contractual provisions of several material recovery facilities across the country, to assist Mecklenburg County in evaluating its own agreement with its MRF service provider. She also conducted research, developed the report, and prepared recommendations.

Commercial Waste Assessment

Horry County, South Carolina

Consultant. Ms. Childs analyzed the County's waste streams for an evaluation of the feasibility of expanding the Solid Waste Authority's Material Recovery Facility. Ms. Childs conducted the fieldwork and wrote the report for the commercial and C&D waste assessment.

Solid Waste Business Plan

Wake County, North Carolina

Consultant. The Wake County Solid Waste Division contracted with R. W. Beck to assist with updating its solid waste business plan. Ms. Childs worked with Division staff to revise the Division's goals, objectives and tactics and incorporate these in the new business plan.

University of North Carolina

M.S.P.H. in Environmental Management and Protection

Ramapo College of New Jersey

B.S. in Environmental Science

Licensing

Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance

Composting Feasibility Assessment

Carbon County, Pennsylvania

Consultant. Ms. Childs analyzed the feasibility of yard waste composting in a rural Pennsylvania County using in-vessel technology. Ms. Childs conducted research on the available technologies and markets for the end-products, and developed the report and recommendations.

Regional Compost Facility Feasibility Study

Cumberland County, Pennsylvania

Consultant. Ms. Childs analyzed the feasibility of a regional yard waste composting facility for a county and several municipalities. Ms. Childs is conducting research on permitting issues, operational aspects, and costs and will summarize her findings and recommendations in a final report.

Solid Waste Management Plan Update

Wake County, North Carolina

Consultant. Ms. Childs is currently assisting Wake County to update their 10-Year Solid Waste Management Plan. Specifically, she has been assisting with researching and writing summaries of County and municipal waste reduction and recycling goals, current programs, and intended actions.

Waste Characterization Study

New York City, New York

Crew Supervisor. R. W. Beck conducted a citywide waste characterization study for the City of New York's Department of Sanitation ("DSNY"). The study included three components, a study of residential refuse and recycling, a study of street basket waste, and a study of multi-unit apartment building recycling. Ms. Childs served as a Crew Supervisor for the recycling staff.

Pay-As-You-Throw Study

Spring Township, Pennsylvania

Consultant. Review of the Township's existing solid waste and recycling collection services and evaluation of the potential impact a PAYT program may have on the Township's solid waste program. Ms. Childs assisted with recommendations and report development.

Schools Recycling Study

Mecklenburg County, North Carolina

Consultant. R. W. Beck performed on-site "spot" waste composition audits at various public schools in Mecklenburg County. Ms. Childs was responsible for supervising workers performing the field study on the capture effectiveness and additional diversion potential for the County schools, analyzing the resulting data, and developing strategy recommendations for recovering additional available material.

Ronald A. Perkins, P.E.

Mr. Perkins has 35 years of experience working with international, national, state, and local organizations in the waste management industry. His peers have internationally recognized his skills in the evaluation and design, implementation, and operation of innovative and cost-effective solid waste and recyclables collection and processing systems. Additionally, he worked for 14 years as a private owner/operator of a solid waste management firm that pioneered the use of one man waste collection vehicles and curbside collection of recyclables in the Northeast.

Mr. Perkins has participated in and managed development of solid waste strategic plans, review of management and operational structures, analysis of systems operations and technical performance, analysis of solid waste management system costs, and preparation of technical documents for privatization. His practical experience and commitment to cost-effective management of solid waste have resulted in invitations to make technical presentations to over 150 regulatory and legislative committees, public meetings, and professional conferences.

Mr. Perkins was previously employed with SCS Engineers and developed his solid waste management experience as Director of Recycling Operations with the American Plastics Council, owner/operator of Waste Control Systems, Solid Waste Program Director for the City of Portland, Oregon, and staff engineer with the U.S. Public Health Service.

Relevant Project Experience

Analysis, Design, and Operation of Waste and Recyclables Collection Systems

- Development of collection productivity models for curbside, alley, and backyard collection systems for the U.S. Public Health Service based on field research in twelve municipalities.
- Proved the efficacy of collection system productivity models as owner/operator of Waste Control Systems, a waste management firm that provided contract waste and recyclables collection services to thirteen communities between 1972 and 1991.
- Applied collection productivity models and route optimization techniques in the identification of cost saving waste and recyclables collection strategies in twelve communities.
- Managed nationwide research for the American Plastics Council (APC) designed to identify and model innovative curbside recyclable material collection systems, evaluate ways to increase participation/material recovery, and lead to the publication of a “How to Collect Plastic” manual for curbside collection of all recyclables.

Amos Tuck School, Dartmouth College
Business Administration

University of Maine
Civil Engineering

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance

Analysis of Collection and Processing Systems Operations and Technical Performance

- Evaluated ten single stream processing facilities for their effectiveness in minimizing loss of plastic bottles to paper bales and residue.
- Evaluated system operations and technical performance of thirteen resource recovery facilities across the U.S. while Solid Waste Program Director for the City of Portland, Oregon.
- Designed and managed consultant performance of an in-depth analysis of systems operations and technical performance at seven state of the art material recovery facilities (MRFs) for the American Plastics Council.
- Evaluated the performance of automated and semi-automated refuse collection systems in selected U.S. cities and their applicability for Montgomery County, Maryland.

Analysis of Costs of Solid Waste Management for Municipalities

- Developed scope of work and managed Solid Waste Association of North America (SWANA) consulting team that performed a comprehensive assessment of six integrated waste management systems applying rigorous full cost accounting principals to calculate accurate and defensible system costs.
- Performed economic and technical evaluation of recyclables collection and processing options for the Town of Brunswick and Lincoln County, Maine, resulting in the first curbside (Brunswick) and countywide drop-off collection and processing system (Lincoln County) in the State.
- Performed economic and technical evaluation of waste collection and transfer alternatives for the rural communities of Brunswick, Gorham, Naples and Poland, Maine.
- Performed economic and technical evaluation of waste disposal alternatives for the rural communities of Lincoln County, the Town of Brunswick, and the City of Gardiner, Maine.
- Developed scope of work and managed Solid Waste Association of North America (SWANA) consultant that developed a manual and training course: Getting More for Less: Cost Cutting Strategies for Collecting Solid Waste and Recyclables, based on analysis of the costs from municipalities with cost-effective collection systems.

Waste Management Operations Experience

- Owner/operator of waste management firm (Waste Control Systems) that provided innovative and cost-effective waste and recyclables collection services under contract to 15 municipalities in New Hampshire, Vermont, Massachusetts and Connecticut over a period of fourteen years. Competitiveness was based on use of one-man collection vehicles to optimize driver productivity and minimize collection costs.
- Managed recyclable materials drop-off sites in Lebanon and Hanover, New Hampshire for Waste Control Systems.

Dr. Herbert M. Kosstrin

Dr. Kosstrin has more than 35 years of experience in the development, demonstration, and evaluation of processes to enhance environmental performance, produce alternative fuels, and provide alternative sources of power generation. In recent years he has been involved in a number of assignments involving scrap tire recycling technologies and market analyses.

Dr. Kosstrin has managed evaluations of various alternative scrap tire management and waste conversion technologies for government agencies, private equity investors, and public utilities. These feasibility studies investigated both the technical and potentially commercial aspects of the particular process. The evaluations reviewed all relevant information and typically included conceptual designs, with appropriate cost estimates for site-specific applications in order to obtain unbiased results. Typical technical issues addressed by Dr. Kosstrin include the assessment of the environmental impact of the technology, potential system availability and redundancy requirements, the effect of fuel quality on the process, and constraints based on specific site characteristics.

Dr. Kosstrin has also been involved with the development and demonstration of processes that converted solid waste products to alternative forms of energy and in the review and acceptance of waste combustion systems. During these endeavors he has been responsible for determining the energy value (heating value) of various solid fuels including agricultural waste, municipal solid waste, waste tires, and other waste products.

Dr. Kosstrin holds two patents for alternative technologies.

Relevant Project Experience

Tire Recycling Feasibility Study

PRIDE of Florida, Inc./Tallahassee, Florida

Technical Manager. Dr. Kosstrin assisted in this Tire Management Study. This project involved the evaluation of how PRIDE could become involved in solving the waste tire problem in Florida. A market survey was performed, a tire disposal technology selected, and a business plan prepared.

Tire Management Study

State of New Hampshire

Project Manager. Dr. Kosstrin was responsible for this tire management study, which had the dual purpose of establishing methods to eliminate potential environmental hazards from the Hunt Tire Pile and to establish a mechanism to handle the continuing flow of tires into the State. This study has established the number of tires at the Hunt Site, investigated potential remedial actions, and identified environmental

University of Pittsburgh
B.S. in Mechanical Engineering

Cornell University
M.E. in Aerospace Engineering
Ph.D. in Mechanical Engineering and Aerospace Engineering

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance

concerns. On the general tire issue, Dr. Kosstrin reviewed existing tire disposal technologies, established cost estimates for selected technologies, and identified environmental concerns of these disposal technologies.

American Typlax Systems Feasibility Review

Mellon Bank/American TYPLAX Systems

Project Manager. Dr. Kosstrin managed this Engineering Feasibility Review of a scrap-tire-to-substitute-plastic-resin process. He was responsible for the technical and economic evaluation of this process, which takes whole tires and produces an intermediate, clean crumb rubber product and subsequently makes a plastic/rubber resin for use in the plastics industry.

Tire Pyrolysis Project

Synpro Industries/Alabama

Project Manager. Dr. Kosstrin provided an independent technical review and subsequently performed a complete independent technical and economic analysis of a series of scrap tire pyrolysis projects for Synpro Industries Group (Synpro). The technology to be employed by Synpro is an indirectly heated pyrolysis in which rubber tire pieces are converted via high temperature into a fuel gas, an oil, and carbon-rich char. The gas and oil are intended to be used as energy products and the char as a partial substitute for a range of carbon black products.

Tire Pyrolysis Review

High Street Capital Partners/Boston, Massachusetts

Project Manager. Dr. Kosstrin performed a fatal flaw analysis of the SMS tire pyrolysis technology. SMS uses an indirectly heated pyrolysis furnace to decompose tire chips into an oil, gas, and char (carbon black). R. W. Beck reviewed the technology, the potential markets for the oil and gas, and the quality of the carbon black. Dr. Kosstrin also performed a full Independent Engineer's Report, including a tire supply study, environmental review, cost review and contract review.

Tire Pyrolysis Review

Industrial Research and Technology Group/Columbus, Ohio

Project Manager. Dr. Kosstrin performed an Independent Engineering Review of the IRTG tire pyrolysis technology for a project in Logan, Ohio. Our review consists of a review of technology, environmental aspects, capital and operating cost and contracts. In addition, he reviewed the potential markets for the four products produced by the process; oil, gas, char (carbon black) and recovered steel.

Tire Pyrolysis - Independent Technical Review

Rescon Management, Inc./Baltimore, Maryland

Rescon retained R. W. Beck to perform a technical review of a proposed pyrolysis project to be located in Baltimore, Maryland. The Rescon technology is intended to produce three products from chipped tires. These products are. The process consists of indirectly heating the tires in an inert atmosphere to produce these products. The oil is separated from the gas in a standard petrochemical process. All products are intended to be sold.

Dr. Kosstrin’s services included review of this emerging technology, including its development and demonstration experience, review of performance predictions, assessment of the technology’s potential for commercial operation, and highlighting of any potential problems that may be encountered in scaling up the technology from the pilot plant stage.

Brent Meyers

Mr. Meyers is President and Chief Executive Officer of Manex. He brings twenty years of leadership and consulting success in developing and cultivating profitable businesses across a number of industries, including manufacturing and distribution, retail, hospitality, technology, and services. He has experience in developing corporate strategies and aligning organizations to achieve breakthrough objectives.

Mr. Meyers is a professional member of the American Marketing Association and Association for Manufacturing Excellence (AME) and lectures in Services Marketing and Services Strategy at the Cornell University Hotel School.

Cross-Industry Strategic Consulting Practice

Grant Thornton, LLP

Mr. Meyers developed and led the multi-million dollar, national cross-industry strategic consulting practice for Grant Thornton LLP. In this leadership role, he led his team to achieve 100% annual growth as the most profitable and fastest growing consulting practice for the firm. Mr. Meyers also served as Chief Strategy Officer and was an active member of the Leadership Committee shaping the firm's strategic direction.

Consulting Practice

Andersen

Mr. Meyers held a number of key leadership roles with Andersen, including the development and leadership of its first cross-industry strategy practice. He drove the firm-wide adoption of new consulting methods in the areas of strategy, revenue enhancement, mergers and acquisitions, new product development, and customer satisfaction/retention that resulted in new and expanded client business and improved client satisfaction.

Areas of Expertise

- Corporate Strategy
- Business Transformation and Globalization
- Revenue Enhancement
- Merger and Acquisition Strategy Integration
- New Product Development
- Customer Satisfaction and Retention

Additional Experience

The following bullets discuss Mr. Meyers' additional experience.

- Created aftermarket accessory pricing and bundling strategies for a major auto manufacturer.

Cornell University

M.B.A. Strategy and Marketing

University of California Berkeley

B.A. in Economics and Business Law

Licensing

Not Applicable

Tasks to Be Performed

- Co-Lead for Business Assessments and Assistance

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- Developed corporate positioning and overall strategy for an online industrial exchange, and provided oversight for strategy-design-technology integration from multiple vendors.
- Developed corporate and M&A strategy for a vertical-industry exchange, along with associated operating strategies, global expansion strategies, and financial pro-formas.
- Conducted market and competitive analyses and developed product/brand positioning strategies for an international networking company's e-commerce products.
- Developed affiliate/partner identification and acquisition decision models for a leading on-line alternative payment solution provider.
- Developed corporate and operating-unit e-Business strategies for a leading international entertainment and imaging company.
- Identified and quantified various sources-of-revenue for a demographic-focused portal.
- Created business model and viable revenue growth strategies for a Generation Y portal.
- Evaluated online entertainment/education and television-web convergence opportunities to leverage a children's author's publishing success.
- Facilitated new product/service concept and development, corporate positioning, and ensuing strategic planning for a technology-intensive consumer loyalty program.
- Assessed market viability, appropriate positioning, OEM and retail channel strategies, and developed market launch strategy for an electric motor technology start-up.
- Developed and facilitated a strategic plan to leverage new vertical market opportunities (and brand extensions) for a global electronics and telecommunications company through differentiation and positioning.
- Identified target market segments and customer requirements to create new product development methodology, feature-set, and pricing model for a global telecommunications company, resulting in market leadership.
- Identified and assessed worldwide target markets for a new product from a major computer technology component manufacturer.
- Facilitated a joint European marketing strategy between a global auto manufacturer and electronic components provider.
- Provided strategic advisory services to a leading conductive cable manufacturer and distributor, identifying new channel opportunities and brand creation strategies.
- Identified and prioritized key strategic initiatives for an auto components distributor facing disintermediation by its sole-source manufacturer.
- Designed strategic planning process and developed corporate strategy for an industrial distributor seeking growth opportunities outside of its primary manufacturer product line.
- Developed corporate strategy, organizational structure, and merger integration plan for two leading regional telecommunications companies.
- Assessed gaming revenue improvement opportunities, and appropriate positioning and brand message, for a major casino resort, resulting in market-share growth leadership.

Isidro (Izzy) Galicia

Mr. Galicia is the Vice President of Client Services at Manex. He brings a wealth of experience in driving business enterprise transformation, resourceful cost reduction, and productivity improvement for a wide range of Fortune 100 and 500 businesses (including the 'big three' automotive manufacturers). His expertise includes operational design and restructuring, process optimization and standardization, and performance benchmarking. Mr. Galicia has international experience working with operations in Asia, Europe, and Latin America across the automotive, aerospace, food, military, real estate service, mass transportation, and rail sectors.

Mr. Galicia is the recipient of the distinguished National Association of Manufacturers Shingo prize for manufacturing excellence and is certified in Green Belt Six Sigma, GE/FPS Six Sigma, 2000. He is a contributing member of the American Electronics Association (AEA), The Association for Operations Management (APICS), National Tooling and Machining Association (NTMA), and the Society of Manufacturing Engineers (SME). Mr. Galicia is a frequent lecturer for these associations, delivering best practices seminars.

Areas of Expertise

- Strategic Planning, Policy Deployment, Performance Metrics, Employee Development, and Master Planning.
- Project Management, Infrastructure Design, and Organizational Development.
- Lean Manufacturing Practices, Six-Sigma, Total Quality Management and Toyota Production System Management (NUMMI/Japan).

Representative Clients

- Del Monte Foods
- Safeway
- United Airlines
- Rolls-Royce
- Hormel Foods Corporation
- The Hershey Company
- Bombardier Transportation
- Ford Motor Company
- General Motors (GM Saturn Division)
- DaimlerChrysler
- BMW Group/Saturn (SAI)
- Delphi Packard Electrical Systems
- New United Motor Manufacturing Inc. (NUMMI)

University of Phoenix
B.S. in Business Management

California State University
B.S. in Business Management

Licensing
Not Applicable

Tasks to Be Performed

- Business Assessments
- Business Assistance

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Michael L. Honeycutt

Michael Honeycutt is Chief Financial Officer and Chief Operating Officer of Manex. He leads all financial and operational aspects of the company implementing key business initiatives to maximize the company's financial performance while improving Manex's market responsiveness. Mr. Honeycutt brings to the position financial and operations management expertise in financial strategies, operations management, and top and bottom-line improvement practices. In addition, Mr. Honeycutt provides high-value executive advisory services to clients.

Mr. Honeycutt joined Manex following a fifteen-year career at Hewlett Packard, holding a number of key management positions in which he led strategic financial and operational initiatives that resulted in improved cash flow, profit performance, and process efficiencies throughout the company.

In addition to his wealth of experience with Hewlett-Packard, he also provided consulting services to a variety of small and midsize businesses, including serving as Interim Chief Operating Officer for Production Technologies. In this role, Mr. Honeycutt drove operational improvements with the implementation of integrated systems across manufacturing, engineering, and human resources.

Mr. Honeycutt is a key member of the National Association of Black Accountants (NABA) at both the national level and local level with the San Jose State University Chapter, serving as President previously. In addition, He actively participates in the Credit Managers Association (CMA) and is strongly involved in the community as a mentor to one of the local Bay Area schools and a volunteer for United Way.

Areas of Expertise

- Corporate Finance Strategies
- Profit Improvement & Cost Reduction Practices
- Operations & Asset Management
- Budgeting & Funding

Representative Clients

- Production Technologies
- Core-Mark International.

San Jose State University

B.S. in Accounting

Licensing

Not Applicable

Tasks to Be Performed

- Business Assistance

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Bruce Macurda

Mr. Macurda has 15 years of consulting and industry experience, spanning several sectors, including manufacturing and distribution, financial services, the public sector, transportation, professional services, agriculture, and high tech. He works with clients to develop and deploy enterprise-level business intelligence systems (activity-based cost management, business modeling, forecasting, score-carding and event-management). He has led initiatives in the areas of cost management, operations improvement, business process reengineering (BPR), financial analysis, corporate strategic planning, information technology, strategic planning, and market research to help companies improve performance and achieve profitable growth.

As an expert in cost management, he frequently teaches in-depth , Activity Based Management (ABM), and Balanced Scorecards courses, and has been featured in leading industry publications. Prior to joining Manex, Mr. Macurda was a Principal in SAP's Business Consulting group and began his consulting career at Deloitte & Touche LLP.

Areas of Expertise

- Corporate Strategy, Competitive Analysis & Strategic Positioning
- Process Analysis, Design & Implementation
- Activity-based Cost Management Systems
- Balanced Scorecard Development, Implementation, Training

Representative Clients

- Hughes Network Systems (HNS)
- The Boeing Company
- Rogerson Aircraft Corporation
- Spectrolab
- Cemex
- J.G. Boswell
- EJ Enterprises Worldwide
- Tiernay
- COSMAR
- USANA Health Sciences Inc.
- Petroleos Venezuela S.A.
- World Color Press Inc.
- FedEx Corporation
- U.S. Mint
- U.S. Marine Corporation
- Experian
- Allstate Insurance Company
- WellPoint Inc.
- Blue Cross & Blue Shield Association
- Wells Fargo & Company
- Electronic Data Systems Corporation (EDS)
- American Express Company

University of Pennsylvania
M.B.A., Wharton School of Business

Georgia Institute of Technology
B.S. in Aerospace Engineering

Licensing
Not Applicable

Tasks to Be Performed

- Business Assessments
- Business Assistance

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David Vaughn

Mr. Vaughn is an Engagement Manager at Manex. He is an accomplished, seasoned professional with over twenty-two years of in-depth experience in business process design and improvement methodologies. His expertise spans several sectors, including general manufacturing, food processing, bio-tech, consumer packaged goods, and business services. Mr. Vaughn has a proven track record in delivering innovative solutions for complex process, quality, customer service, and organizational issues.

Mr. Vaughn is a highly regarded university instructor and faculty member in business management at the University of Phoenix and DeVry University Keller Graduate School of Management.
He consistently receives the highest ratings for his courses on quality management and productivity, operations management, and project management.

Areas of Expertise

- Business Process Design and Improvement
- Quality Management Systems
- Lean Enterprise, Six Sigma, and ISO 9000 Quality Systems
- Facilitation, Training, and Leadership Development

Representative Clients

- United Airlines
- Del Monte Foods
- Sunsweet Growers Inc.
- Ceronix Inc.
- Coherent Inc.
- Foster Farms
- McKee Foods Corporation
- Tom's Foods Inc.
- General Mills

Southern Polytechnic State University

M.S. in Quality Assurance

University of Arkansas

B.S. in Natural Science

Certifications

ASQ Certified Quality Engineer
RAB Certified Quality Auditor
ASQ Six Sigma Black Belt Certification

Task to Be Performed

- Business Assessment and Assistance

manex
Business Transformation. Delivered.

Will Dedman

Mr. Dedman is an Engagement Manager at Manex. He has nineteen years of in-depth experience in manufacturing and assembly operations, implementing leading manufacturing methods and improvement strategies in enterprises across North America and Europe.
He specializes in diagnosing production problems, re-engineering production flow, and establishing operational metrics for improved business performance. With experience in the Toyota Production System and Lean Manufacturing Principles, Mr. Dedman excels at identifying and implementing process improvements throughout the manufacturing environment for sustained results.

Mr. Dedman is the recipient of the 1998 North American Manufacturers Award for Workforce Excellence and frequently delivers high-impact manufacturing workshops and customized training sessions on leading practices including Continuous Improvement, Total Predictive Maintenance (TPM/OEE), Lean Principles, Pull Systems, 5S, and Visual Factory.

Areas of Expertise

- Lean Manufacturing Principles
- Toyota Production System Management (NUMMI/Japan)
- Production Problem Diagnosis and Resolution
- Workflow and Production Flow
- Product Design and Pilot Production Problem Diagnosis

Representative Clients

- Ford Motor Company
- Saturn
- DaimlerChrysler
- Del Monte Foods
- United Airlines
- Delphi Packard Electrical Systems
- Vogt Valve
- Argus Valve
- Rexnord Industries Inc.
- Tapco Products Company
- Limitorque
- Tenneco Automotive
- Johns Manville
- Z-World
- TGIF Body Shop
- Applied Engineering Inc.
- A&D Precision
- AMT
- Neil Medical Group
- Travis Airforce Base
- Norfield
- P.K. Selective
- Milbank Manufacturing Company
- Altair Engineering Inc.
- Axia

University of Phoenix
B.S. in Business Management

Licensing
Not Applicable

Task to Be Performed

- Business Assessment and Assistance

manex
Business Transformation. Delivered.

Scott D. Freauf, PMP

Mr. Freauf has more than 25 years of business experience, and is skilled in the application of project management processes and associated tools/techniques in a cross-functional matrix team environment. He is accomplished in the effective initiation, planning, execution, control and closure of projects that implement strategic initiatives for private and public sector organizations across a broad range of industries. Mr. Freauf also has strong interpersonal, analytical and organizational skills. He is experienced in the development and application of project life cycle methodologies. Mr. Freauf has a proven track record in delivering project scope on time, within budget, and to quality specifications. He is practiced in influencing management in the adoption of project management discipline. Mr. Freauf is experienced in the training, coaching, and mentoring of staff.

Work Experience

Amgen, Inc., 2003-2004

Thousand Oaks, California

Associate Director. Amgen is the world's largest biotechnology company. As an Associate Director of a newly established Project Management Office within the R&D Project Management group, my responsibilities included leading the introduction and adoption of generally accepted project management processes; managing the development and standardization of project management methodologies for drug development projects as well as internal process development/improvement projects; coordinating the delivery of project management training programs; and benchmarking and implementing project management best-practices.

- Initiated and led the development of a charter for a Project Management Office
- Coordinated a formal program of four training courses for R&D Project Management staff
- Collaborated with a leading authority on human relations within a project context to tailor a workshop focused on power, influence, and politics in project management to the needs of the organization
- Introduced and led an initiative designed to decompose the program level development life cycle of a new therapeutic compound into its constituent projects and associated major deliverables
- Introduced and led an effort to introduce, develop, and establish a competency model for R&D Project Managers
- Developed and implemented a guide for use by R&D project managers to assist in their development of integrated project plans

George Washington University
Masters Certificate in Project Management

California Lutheran University
MBA Program Course Work

Ohio University
B.A. in Business

Licensing
Not Applicable

Tasks to Be Performed

- Business Assistance

- Introduced the application of a probability based schedule risk management tool
- Introduced the application of a software tools to improve project scope definition and schedule development
- Developed and delivered a workshop to prepare the company's project managers to successfully sit for the examination required to achieve the PMP® credential
- Organized and coordinated an effort sponsored by the company's CIO to establish an enterprise-wide Project Management Advisory Council

IndyMac Bank, 2002-2003

Pasadena, California

Manager. As a senior manager in a newly created position for this technology based mortgage banker with proprietary, award-winning information systems, my responsibilities included providing internal consulting within the IT Application Development group in the areas of project planning, execution and control, as well as benchmarking best practices across multiple projects and/or programs.

- Led an effort to assess problems, determine root causes, and develop a recovery plan for a multi-year, $20 million dollar program undertaken to implement a new Loan Origination System (LOS)
- Established and staffed a Program Support Office
- Guided and mentored multiple project teams in the use of the company's adopted life cycle methodology
- Guided and mentored project team leaders in the application of generally accepted project management processes and associated tools and techniques
- Assisted project teams in the creation of realistic and defensible project plans
- Introduced the application of Earned Value Analysis as a performance measurement tool, receiving highly favorable response from executive stakeholders

Provant Project Management, 1999 – 2001

Atlanta, Georgia

Project Director and Performance Improvement Consultant. Provant Project Management was a professional services firm specializing in the area of project management application, consulting, and training. Provant supported clients in more than 1,000 projects with a total value exceeding $100 billion. As a Project Director / Performance Improvement Consultant, my responsibilities included delivering leadership and consultation to client projects, developing and maintaining client relationships, and facilitating the professional development of client staff.

- Managed a client project to design and deploy wireless LAN technology within a major sports venue to support leading edge e-business initiatives. Major challenges included the expediting of several of the client's procurement processes to meet externally imposed schedule constraint. Project scope was completed within established targets for time, budget, and quality.
- Managed a client project to deploy a telecommunications system designed to support two mission-critical call centers with a total of 1000+ agents. Project scope was completed within established targets for time, budget, and quality.

- Facilitated (as the primary instructor) the delivery of multiple project management training classes to Fortune 500 clients, consistently achieving positive student evaluations

Vanstar, 1997 - 1999

Atlanta, Georgia

Senior Project Manager. Vanstar was a leading provider of services and products designed to build and manage personal computer network infrastructures primarily for Fortune 1000 companies and other large enterprises. As a Senior Project Manager within the company's Program & Project Management practice, Mr. Freauf provided professional services to Vanstar clients in support of projects.

- Managed multiple and concurrent client projects with a combined budget $1.5M budget and a targeted total duration of 7 months, undertaken to design and test components of global open network architecture as part of a migration program. The scope of each project was completed within established targets for time, budget, and quality.
- Negotiated, designed, and delivered an intensive 3-day consultation to assess a client's project management approach for a major project within a large multi-year program, culminating in a presentation to key senior project stakeholders.
- Provided consultation to a client project to remediate and/or replace of financial institution's branch automation applications as well as system hardware components in preparation for Y2K, leading the development of a viable and realistic plan that resulted in the project's scope being attained within targeted cost and imposed schedule constraints.

SPL WorldGroup, 1996 – 1997

San Francisco, California

Project Director. SPL WorldGroup provides proven billing and customer service software solutions to the global utility industry. As a member of SPL's Implementation Services Team, my client focused responsibilities included providing insight into common project issues, offering solutions, and tracking milestones.

- Managed a collaborative effort to define business and technical requirements and produce a functional design for a Customer Information System implementation project.
- Achieved the definition and production of major deliverables within targeted time frame and 10% below targeted cost.
- Introduced the application of probabilistic range estimating for the development of a project schedule that considered uncertainties associated with the duration of component activities.

RAM Mobile Data, 1992 – 1996

Woodbridge, New Jersey

Regional Project Manager. RAM Mobile Data built the nation's first public wireless data network. Reporting to the Director of Project Management, Mr. Freauf was the "pioneer" Regional Project Manager in this start-up environment and was responsible for the management of projects conceived to integrate systems that would extend mission critical information to a client's mobile workforce.

- Managed the development and execution of project plans.
- Introduced key project management deliverables including work breakdown structures, performance baselines for schedule and cost, and risk response plans.

- Directed the production of major proposals, contributing content and performing editorial review; the largest of which represented an opportunity for annual revenue in excess of $2.5 million.

Pacific Telesis, 1980-1991

Los Angeles, CA

System Design Consultant. Pacific Telesis (formerly Pacific Telephone) was the holding company born of the divestiture of AT&T by the federal government. As a System Design Consultant, Mr. Freauf was primarily accountable for all pre- and post-sales technical support as well as post-sales systems implementation project management.

- Collaborated with clients, field sales organization and operations staff to define, develop and deliver opportunities for the application of telecommunications products and services.
- Provided technical leadership to multiple internal teams in the performance of requirements analysis, technical feasibility analysis, solution development & design, proposal development & production, and implementation planning & execution.
- Led a two-year statewide project, with potential $4 million annual revenue, to develop, design, and plan the implementation of local access data transport service for a major national account.
- Coordinated marketing, technical, and regulatory resources from several internal departments as well as multiple outside vendors in the effort to define product specifications and meet overall project objectives.
- Completed a rigorous training and assessment program achieving required internal certification.

Service Manager. As a service manager within a division of Pacific Telesis my responsibilities included pre-sales support of solution development and system design, as well as the management of post-sales systems implementation projects and ongoing customer service.

- Performed system design based upon defined customer requirements.
- Managed multiple contracted service installation teams
- Coordinated post installation customer training.
- Managed and performed post installation maintenance

Sales Support Manager. As a Sales Support Manager within the regulated environment, MR. FREAUFwas the focal point of integrative responsibility and customer interface associated with the support of service configuration, implementation, and maintenance for major commercial accounts.

- Collaborated on business/account plan development
- Served as customer service point of contact for major clients

Geoff Downer

Mr. Downer is a Senior Consultant at CMTC. He has industry familiarity in the following areas: injection molding plastics and rubber, materials testing, aerospace, automotive, mechanical engineering, electromechanical, chemicals, paper and printing, metrology, and service organizations.

Mr. Downer specializes in ISO 9001, AS9100, QS9000, laboratory ISO/IEC 17025, Q1, advanced quality planning, design and process FMEAs, SPC TQM, vendor audits and selection, metrology, materials testing, quality costs, and problem solving.

Mr. Downer's experience includes seven years as a Project Engineer . His work involved machine shop production, injection molding, composite manufacturing, assembly, process treatments and specialist fault detection, and material testing.

Mr. Downer worked for eight years in the automotive and aerospace industries as a Quality Manager including four years as the Corporate Quality Manager of a multi-site organization manufacturing automotive and aircraft parts, and assemblies. He was responsible for all matters concerning quality assurance in the design, manufacture, procurement, and inspection, including the department budget controls and human resources over multiple sites.

As a Consultant, Mr. Downer has provided project managed quality improvement initiatives in a variety of manufacturing and service environments. He has assisted over 50 companies achieve registration to the ISO 9000 series of standards and 12 companies to QS-9000, within the last 10 years. As a Lead Assessor, Mr. Downer has conducted many Lead Assessor, Internal Auditor, and ISO 9000 implementation courses in Europe and the U.S.. Additionally he has practical experience with ISO/IEC17025 and AS 9100.

Work History

Diehl and Associates, Inc

- Quality Management Consultant

H&E Manufacturing Group

- Corporate Quality Manager

Edgely Aircraft, Ltd

- Quality Manager

Westland Helicopters, Ltd.

- Project Engineer

University of Southampton

B.S. in Mechanical Engineering

Licensing

Not Applicable

Tasks to Be Performed

- Business Assistance

Saeed Madjidi

Mr. Madjidi has experience in the following areas: molding process, tooling, plant start up, plant layout, product development, quality programs, training, and manufacturing. His industry familiarity also includes aerospace, and semiconductors.

California Manufacturing Technology Center

Consultant. Mr. Madjidi specializes in plant layout and modernization, process reengineering and improvement, lean manufacturing, equipment selection, team building, and training.

McDonnell Douglas Company

Senior Manufacturing Engineer, Flight Ramp Operations. Mr. Madjidi worked with C-17 Military transport aircraft. His responsibilities included developing new assembly line and process for manufacturing the C-17 forward fuselage section, analyze workflow, improving process and manufacturing methods, and designing work area layouts. Mr. Madjidi also provided technical support to production personnel, prepared conceptual manufacturing tooling plans, developed operational sequence outline and cost summaries, and performed root cause analysis and corrective action programs.

Silicon System Incorporation

Senior Manufacturing Engineer. Mr. Madjidi worked with semiconductor assembly and final test division for CMOS and SmartFlex products. His responsibilities included defining manufacturing operations and equipment required for producing conforming products, evaluating new automated test systems, and redesigning existing test equipment to improve machine throughput a product quality and reliability. He also generated process specifications and maintenance manuals, performed production capacity analysis and scheduling, and performed customer return failure analysis.

International Rectifier

Process Engineer. Mr. Madjidi worked in the high power semiconductor assembly division. His responsibilities included new product and process development for plastic and Hermetic products.

Advanced Micro Devices

Packaging and Process Engineer. Mr. Madjidi worked in the semiconductor division assembly operations. His responsibilities included providing technical support to offshore facilities, coordinating and resolving technical problems between offshore facilities and support group in U.S., and developing new products and process for Plastic and Hermetic packages. Mr. Madjidi traveled extensively in South East Asia and Europe. He evaluated new and automatic assembly equipment for die and wire bonding, molding, trim, and soldering operations and final test.

University of Phoenix, Torrance
M.B.A.

University of Washington, Seattle
B.S. in Industrial Engineering

Certifications
N SPC, Toyota Production System

Licensing
Not Applicable

Tasks to Be Performed
- Business Assistance

Enrique Mora

Mr. Mora is a Senior Consultant with CMTC. As a consultant, Mr. Mora has managed continuous improvement initiatives in a variety of manufacturing environments. Additionally, He has assisted over 40 companies achieve improved productivity within the last 20 years.

Mr. Mora's familiarity with the industry includes the areas of automotive (1st to 3rd Tiers), aluminum die-casting, computer assembly, cold rolled steel lamination, foundry, acrylic and sheet metal fabrication, machining, mining, mechanical engineering, electrical, electromechanical, petrochemicals, pipe shaping, shipbuilding, injection molding plastics, meat and food processing, candy and gum, and vitamins.

Mr. Mora has twelve years of experience as a Plant Engineer in the automotive industry, involving maintenance, installations design and execution, programming, training. Additionally he has two years of experience in the shipbuilding industry as TPM and Continuous Improvement Coordinator organizing the manufacturing of automotive parts and assemblies. He was responsible for all matters concerning quality assurance.

Mr. Mora specializes in lean manufacturing practices through Kaizen Events including:

- TPM (Total Productive Maintenance)
- SMED (Quick Setups)
- VSM (as a culture, not an event)
- 5S (Order and Cleanliness)
- Jidoka (Quality at the Source or Zero Quality Control)

Additionally, Mr. Mora specializes in the following:

- Management Through Leadership
- Customer Service Skills
- Communication – Motivation – Negotiation
- Human Relations and Personal Improvement
- Conflict Management

Work History

CMTC

- Senior Consultant

Methods, Organization, Resources, Achievement, LLC.
Green Bay, Wisconsin

- Lean Manufacturing Consultant.

Marshall Institute
TPM Coordinators Workshop (Certification Process)

Anitech Consulting Services
Certification on Kaizen-5s's SMWD and TPM

Instituto Politencnico Nacional Mexico
Mechanical Engineering

Licensing
Not Applicable

Tasks to Be Performed

- Business Assistance

NASSCO, San Diego, California

- TPM and Lean Coordinator.

ESPAC Querétaro, México

- Computer Assembly Plant, General Manager.

Pan Integral de Querétaro, México

- Bakery Process Manager.

Ford Motor Co. Foundry and Assembly Plants

- Plant Engineering Management.

Dan Hauschild

Mr. Hauschild is President and founder of AMPros Corporation, with 22 years' applicable business, and 15 years' management consulting experience for recycling, manufacturing, and high technology companies. He has a range of experience in business and financial management, plus technical background in materials and process engineering as well as the management of design and production processes. He developed a Business Assessment Protocol and provided Strategic and Operational Business Assistance to numerous businesses in recycling and manufacturing market segments. His Business Assessment Protocol was specifically applied to improving performance at numerous Minnesota recycling companies and adapted to deliver the first of its kind Recycling Industry Benchmarking and Financial Performance report in January 2005.

Mr. Hauschild has trained executive management in strategic planning, provided team leadership in quality improvement processes and developed innovative techniques for integrating Activity Based Costing (ABC) with Total Quality Management. He designed, developed, and marketed two software applications, AcTEAM!TM and Profitize It TM for strategic financial analysis, cost improvement, and computation of over 100 key performance measures including Z-Score & Economic Value Added.

Mr. Hauschild was elected to the Board of Directors for Hi-Tek Rubber, Inc. and served as corporate secretary from July 2001 through December 2004. Hi-Tek Rubber is a development and manufacturing company that converts crumb rubber into simulated slate and cedar shake shingles. Mr. Hauschild provided expertise in financial and operational analysis, business plan development, and documentation in filing for securities exemptions under SEC regulations in the private placement of shares with qualified investors.

Wyoming Machine, Inc.

Wyoming Machine, Inc. (WMI) is a sheet metal fabrication company that first undertook Business Assessment in 1999 followed up on the recommended Business Assistance critical success factors actions. The first initiative was comprehensive operational analysis and Strategic Plan development followed by process and material flow improvement via more efficient plant layout. Information system requirements definition, selection, and implementation followed analysis and restructuring of processes. Determining product and customer profitability drove to product re-pricing as well as re-alignment of overhead costs and rates. Mr. Hauschild assisted WMI in preparation for and attaining ISO 9000:2000 certification. Overall productivity increased nearly 50% and profitability by 300% over the past 5 years and the company is now in the next iteration of its strategic plan.

University of Minnesota
B.S. in Chemistry

Continuing Education
Training as an ISO 9000 Lead Assessor for Quality Systems

Licensing
Not Applicable

Tasks to Be Performed

- Co-Lead for Business Assessments and Assistance

AMPros Corporation

Minnesota Office of Environmental Assistance (MOEA) (now part of Pollution Control Agency)

MOEA engaged AMPros Corporation to apply the Business Assessment Protocol specifically to Minnesota recycling companies. Numerous companies participated in the assessment process and received individual 50 to 75 page reports detailing critical success factors and recommended actions. Several companies requested subsequent Business Assistance. AMPros Corporation, under funding from the U.S.-EPA and MOEA sponsorship, adapted its Business Assessment Protocol to conduct a first of its kind Recycling Industry Benchmarking and Financial Performance project. Businesses from Minnesota, Wisconsin, Illinois, Iowa, Michigan, New York, Pennsylvania, and Ohio were invited to participate.

Asset Recovery Corporation

Asset Recovery Corporation is an electronics recycling company based in Minnesota that requested a Business Assessment. Although a successful company at the assessment time, several opportunities and critical success factors were identified. Subsequent Business Assistance focused on customer and product profitability, and realignment of processes with business goals resulting in substantial growth in both revenue and profit.

Additional Experience:

- **Developed business assessment protocol** for assisting companies to direct and focus improvement activities where financial performance and goals are integrated and validated against operational processes and marketing objectives.
- **Performed business and technology assessments** for recycling & manufacturing companies. Financial, product mix and process analysis resulted in defined goals, prioritized actions to achieve projected revenue growth, process documentation, and recommended business systems improvements. Subsequent Business Assistance derived short and long term goals, performed financial analysis, and established Business Strategic Plans and focused improvements on cost of goods sold. Provided training in marketing strategy resulting in a documented and implemented Marketing Strategy Plan.
- **Lead technical and economic analysis** efforts for a Minnesota Office of Environmental Assistance project in determining the feasibility for recycling fiber glass reinforced plastics materials.
- **Managed the development and implementation of conceptual and detailed facility design** for manufacturing. Implementation included principles of cellular manufacturing, cycle time reduction, pull scheduling, JIT, SPC, Total Quality Management, self directed work teams, kanban and integrated support systems.
- Mr. Hauschild has served as a guest lecturer in the Accounting & Manufacturing MBA programs at the University of St. Thomas in St. Paul, MN on the practical applications of Activity Management. **Conducted workshops** for the Institute of Management Accountants covering the relationships and integration of Activity Management techniques with TQM and Reengineering. Presented papers on **Cost of Capacity** and **Performance Measurement** at national conferences based on accomplishments at client companies. Subsequently selected as a **panelist** for the Society of Management Accountants of Canada to help develop a guideline for managing the cost of capacity.

Mr. Laxson has more than 12 years' relevant business management consulting and 14 years' post-military service in business management, including international experience. He brings a broad base knowledge of business operations to bear on business problems and delivering cost-effective solutions on-time and within customer budget. Mr. Laxson is certified in Economic Development Finance, specializes in operations, HR, OSHA, Business Information Systems and regulatory compliance, and provides leadership for management systems implementation in lean enterprises.

Mr. Laxson has been responsible for developing and managing projects that assist companies in competing in the global marketplace. He has performed functional assessments to determine the effectiveness of installed technology and identify the appropriate technologies to meet the future strategic and tactical needs of the company. Further, Mr. Laxson assists companies in planning, developing, and implementing programs that result in business improvement, job retention/creation, and increased value.

Lake Shirts, Inc.

Lake Shirts, Inc. is a twenty-year-old full service screen printing, embroidery, and dye works company. Having grown from a basement start-up to become a more than $100 million company, Lake Shirts is a nationally recognized resource providing specialty items for prestigious events. Challenged by a long supply chain, unique short-term demands, and off-shore competition, the company engaged Mr. Laxson to identify the best enterprise software available, negotiate its purchase, and manage the implementation.

Micromedics Inc.

Micromedics is a manufacturer of medical devices for various applications including ENT, instrument management, and biomaterials applications. Mr. Laxson was engaged by the company following a full diagnostic assessment to put forward a cost effective end-to-end software solution that supports the EU Medical Device Directive, (MDD) as well as ISO-9001, ISO-14001, ISO-13485 and EN-46001. Mr. Laxson assembled a team of Micromedics employees and accomplished the task in fifteen weeks. The initial investment in software, $170,000, was recovered in the first six months following full implementation through accelerated throughput, improved competitive advantage, and lean processes.

Pier Pleasure, Inc. and Wilson Trailers, Inc.

Pier Pleasure, Inc. and Wilson Trailer, Inc. are to sectors of a privately owned manufacturer of boat lifts, docks, piers, and a wide variety of accessories and a distributor of Wilson trailers. The company found it needed a method to track material, both raw and finished goods as well as a comprehensive financial accounting system that provided a method

William Laxson

University of Maryland, UC
Organizational Management

Grantham College, Slidell, LA
Electronic Engineering Technology (AAS)

University of St. Thomas
Mini MBA in Entrepreneurship and Leading Growing Companies

Certificates
NDC EDFP
Business Valuation and Acquisition

Licensing
Not Applicable

Tasks to Be Performed

- Business Assessments and Assistance

AMPros Corporation

to consolidate or split reporting for the two companies. Mr. Laxson was engaged to help define the needs, develop a profile, and determine the best "off-the-shelf" package that would satisfy the needs of the company and the company owners. Each of the two companies had different needs and expectations that were addressed, analyzed, and differences resolved. A new software system was purchased, customized, and implemented within the company budget and timeline.

Akkerman Inc.,

Akkerman Inc. is an engineering, design, development, and manufacturing firm specializing in micro-tunneling, pipe-jacking, tunnel boring, guided boring, haul systems, and slip-lining equipment to the trench-less industry. Since the company builds and leases a significant number of tunneling machines, capital asset valuation and depreciation, compliance, and reporting became a major issue as the company grew. The company selected Mr. Laxson to find a solution that supports its multifaceted mission, as well as provides for management control of operations. Mr. Laxson assembled a management team and in a project format, developed a plan to accomplish all the company goals. ERP software was identified and implemented along with new accounting processes that streamlined operations, saved time and money, while keeping strategic and operational control in the hands of the owners.

Gorecki Manufacturing, Inc.

Operations Manager. Mr. Laxson directed all operations, Production, Quality Assurance, Safety, Education and Training, and Customer Relations. He developed and implemented a Total Quality System with a customer focus in support of sales and service of multiple product lines for a Fortune 500 company. He also created and implemented an Employee Development, Education, and Training program. Additionally, Mr. Laxson organized Quality and Safety improvement teams throughout four plants; taught Total Quality Management, OHSA safety, and MPCA environmental classes; and Secured certification to ISO-9000, EN46000.

Olivetti Advanced Technology Center

Project Manager. Mr. Laxson developed business relationships for new technology based office systems products with capabilities to customize solutions on a customer identified basis.
Clients engaged included: Fiat for their manufacturing systems, AT&T and Xerox computer systems, and the United States Government for unique military applications.

Olivetti Corporation of America

Systems Manager. Mr. Laxson managed multinational technology projects in the U. S., Europe, Asia, and Africa including infrastructure development, business information systems, quality assurance, safety and environmental, marketing, sales, manufacturing, and client/supplier service. The accounts serviced ranged from 19 million to 132 million per year and included such companies as Sycor, Dassault Aviation Northern Telecom, Erwin International, Lee Data (now Apertus), and International Information Systems of Haifi Israel.

Mr. Young has the following accomplishments associated with this career. He has been a national speaker on recycling, the environmental movement, environmental politics, seismic safety, and landowner based watershed protection. Additionally, he has been interviewed in over 200 electronic and print media outlets including CNN, NBC, CBS, NPR, Wall Street Journal, Los Angeles Times. Mr. Young is a Board member, National Recycling Coalition and LightHawk. Additionally, he is an Advisor for Pet Assistance League of Northern California.

Young Resources Strategies

Davis, California

Principal. Mr. Young was responsible for providing the following services under this contract.

- Responsible for providing businesses and public institutions with services in environmental management, leadership, and sustainable business solutions.
- Responsible for assisting clients in communications, policy, project leadership, and vision development.
- Responsible for assisting clients in transforming markets, business practices, and policy to create economic incentives that yield positive environmental and economic outcomes.

Department of Conservation

Sacramento, California

Director. Mr. Young was responsible for the following services as a Director at the Department of Conservation.

- Responsible for the leadership of 700 people with a nearly $1 billion budget and 16 regional offices.
- Responsible for initiatives that changed DOC into a highly motivated, nationally recognized leader in vital, innovative, resourceful, and cost-effective programs.
- Directed successful effort to increase visibility increase of department programs through coordinated public outreach and media strategy.
- Established award winning social marketing campaigns that are nationally recognized and duplicated.
- Responsible for successful efforts to reverse decline in beverage container recycling and increased the rate of recycling
- Directed restructuring of grant programs to maximize return on investment, and focus on tangible outcomes and accountability.
- Advanced DOC's role as a leader in remote sensing and mapping technologies.

Darryl Young

University of California, Davis
Political Science Coursework, emphasis in environmental policy analysis and planning.

California State University, Sacramento
Environmental Studies Coursework

Licensing
Not Applicable

Tasks to Be Performed

- Co-Lead for Industry and Sector Wide Assistance
- Business Assistance

Riester-Robb

Governor's Office of Planning and Research

Sacramento, California

Acting Director. Mr. Young performed the following services as Acting Director of the Governor's Office.

- Responsible for transition of the office under a new administration.
- Hired and restructured the Office's State Clearinghouse responsible for state level review of CEQA environmental documents and providing technical assistance on land use planning and CEQA matters.
- Directed research into the fiscal implications the state's commitment to fund local government programs.

Senate Natural Resources and Wildlife Committee

Sacramento, California

Chief Consultant. As Chief Consultant, Mr. Young performed the following services.

- Directed the analysis of environmental legislation.
- Supervision of development and coordination of legislation and hearings.
- Responsible for research, investigations, and oversight of agencies and departments under the committee's jurisdiction.
- Directed work on urban environmental issues such as the greening of the Los Angeles River, MTBE groundwater contamination and PM 10 air pollution control measures.
- Worked on wildlife issues such as salmon habitat restoration and protection.

Sierra Club

San Francisco, California

National Media Director. Mr. Young performed the following services for this position.

- Responsible for the development, direction, and fiscal planning of media and public information programs for the Sierra Club.
- As part of the senior management team, participated in the development of policies and positions.
- Directed strategic media campaigns on the NAFTA, Mining Reform, and the Endangered Species Act.
- Directed training in media relations for staff and volunteers.

Sierra Club California

Sacramento, California

Legislative Representative. As Legislative Representative, Mr. Young completed the following services.

- Legislative and administrative advocate on behalf of Sierra Club California.
- Mobilized grassroots activists in statewide advocacy and media.
- Directed grassroots training in electoral, lobbying and media skill.

Mr. Burnham's achievements include creating a failsafe network that achieved 100% uptime for over 2 years, and creating a GPS enabled relational database application that allows clients to search for the nearest recycling center, curbside pickup, or drop-off location for the California Department of Conservation. Mr. Burnham was awarded the Utah Advertising Federation ADDY awards: 3 gold addys / 2 silver addys for his achievements.

Riester~Robb

Salt Lake City, Utah

Interactive Creative Director/Art Director. Mr. Burhman works as the Director of Technology on all of Riester~Robb's Interactive projects. He has developed interactive applications featuring content administration systems and integration with business programs to create a dynamic web presence for clients.

Coastlink

Salt Lake City, Utah

Freelance Graphic Design / Art Direction. In this role, Mr. Burnham managed two divisions of the company involving Network Administration, Systems Programming and Consulting as well as Interactive web applications. Additionally, he worked with high end applications such as Unix/Linux, Microsoft, Oracle, Cisco, and Sun Microsystems and was responsible for all critical hardware and software purchases

Expertise:

- Created a failsafe network that achieved 100% uptime for over 2 years.
- Created a GPS enabled relational database application that allows clients to search for the nearest recycling center, curbside pickup or drop-off location for the California Department of Conservation.

Tony Burnham

University of Utah, Salt Lake City
Computer Science

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

Ms. Riester has the following accomplishments associated with her career.

- Considered a valued resource for the Centers of Disease Control in Atlanta for tobacco control related research.
- Published in the Journal of Medicine on tobacco control related research and marketing.
- Performed speaking engagements and case study representation at the World Health Conference on Tobacco Control.
- Acting as the lead strategic planner on the nationally acclaimed tobacco control campaign, on successful casino and other brand launches resulting in clients' satisfaction and goal achievements.
- Bringing European Brand Planning philosophies and executions to the valley.
- Awarded the Number 1 and 2, Leading Women in Business in Arizona.

Riester~Robb

Los Angeles, California

Executive Director of Brand Planning for a Full Service Advertising and Public Relations Agency. Ms. Riester has completed the following services for Riester~Robb.

- Responsible for the management and supervision of all research, strategy and brand development work on all of the accounts of Riester~Robb.
- Responsible for all pre-and post marketing campaign research including creative development research (investigation of consumer behavior via structured research disciplines – focus groups, one-on-one interviews, and other creative qualitative research tools) and evaluative quantitative research such as phone surveys, online surveys, or self administered questionnaires.
- Directing, designing, supervising, and conducting all of the required elements of the process development such as the development of participant screeners, discussion guides, surveys, and other written instruments designed to gauge consumer attitudes and perceptions. Managing, designing, and conducting concept evaluation, ad testing, and other brand development tools. Conducting executive workshops to understand and reflect clients' internal visions and mission relative to marketing activities.
- Responsible for the analysis of all quantitative and qualitative research results and the distillation into cohesive behavioral profiles of target audiences and strategic marketing plans.
- Managing, supervising, and conducting the development of brand architectures, brand strategies, creative communications work plans,

University of Hamburg, Germany

M.B.A. in Business Administration, Marketing, and Psychology

Management College, Hamburg Germany

B.A. in Marketing and Advertising

Licensing

Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

and creative briefs. Imparting research-supported consumer insights to clients as well as account services, creative, public relations, and media staff.

- Responsible for monitoring the campaign executions relative to strategic accuracy.
- Directing, supervising, and developing all marketing plans within the firm. Further responsible to work closely with Account Service and the Creative Department to ensure strategic relevance of all materials developed on behalf of clients.
- Managing, supervising, and executing all evaluations of campaign activities and implement modifications necessary to improve overall campaign performance.
- Category experiences at Riester~Robb include gaming, tobacco control, social marketing, recycling, transportation, health insurance, convenience stores, tourism, education, charitable organization, high tech, etc.

BHI

Albuquerque, New Mexico

Director of Marketing. As Director of Marketing. Ms. Riester completed the following:

- Responsible for the revitalization of the BHI brand.
- Redesigned, managed and implemented the development of a revised corporate identity and a revised brand image for BHI and the HEEL brands.
- Managed and supervised all communications with European holding corporation HEEL Inc. in Germany.
- Launched BHI to the consumer health food markets and enhanced its representation within the ethical market segments.
- Category experiences include homeopathic, naturopathic and conventional medicines, health food and grocery stores.

Corporate Communication Concepts

Hamburg, Germany

Account Supervisor. Ms. Riester completed the following services for Corporate Communication Concepts.

- Responsible for leading big brand accounts such as Bertelsmann, Guinness, Unilever and Panasonic. She directed, monitored, and implemented all aspects of brand management including research, analysis, execution, production, distribution, and evaluation of marketing materials.
- Category experiences include publishing, art, direct marketing and catalog development, high tech, music and entertainment, consumer goods (margarine, cognac, vine, etc.), and fashion.

DDBNeedham

Hamburg, Germany

- **Account Executive.** As Account Executive, Ms. Riester conducted and analyzed research, and implemented marketing plan components such as direct marketing, promotions, print, television and radio advertisements. She also participated in monitoring campaign effectiveness and implemented required modifications.

Ms. Witkowski specializes in marketing and advertising projects at Riester~Robb. Her relevant experience is detailed below.

Riester~Robb

Los Angeles, California

Account Executive. Ms. Witkowski is the lead contact for one of Riester~Robb's largest accounts. She works directly with clients to fulfill all needs. Her work includes updating and presenting at weekly status meetings; completing status reports and conference reports internally as well as with client; managing quarterly projections/estimates; and maintaining lead on projects and promotions.

Duncan & Associates

Los Angeles, California

Account Executive. Ms. Witkowski ran Albertsons Southern California Division, the largest Division of Albertsons. She worked directly with radio/TV stations as well as with clients and packaged goods vendors. She also managed projects including production for print, online, TV, radio, and out-of-home (outdoor boards). Her copy writer responsibilities included writing item/price inserts for TV (:15) and Radio (:30); Radio Traffic Reports (:10 to: 15); Co-op radio (:15 to: 30), and In-store announcements (:30)

Nordstrom

Department Manager. Ms. Witkowski was responsible for buying, merchandising operations, and sales staffs. She presented merchandising presentations; participated in all promotions and marketing activities; managed multiple tasks and departments including space planning and allocation; and maintained a high level of vendor relations and customer service. Additionally, she employed persuasive selling techniques and negotiating skills; recruited, trained, and developed staff; and compiled sales analysis reports, composed correspondence, and memos. Ms. Witkowski maintained expertise in all aspects of sales floor operations and buying.

Additional Experience

- Retail & Wholesale Apparel Manufacturers
- Guess? INC.
  Senior Distribution Analyst
- Viewpoint International (Tommy Bahama Division)
  Account Manager
- Manhattan Sports
  Store Manager/Associate Buyer

Stacy Witkowski

University of California, Davis
Political Science Coursework

California State University, Sacramento
Environmental Studies Coursework

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

Mr. Ortega has the following achievements.

- Launching the initial PETsMART brand with Phillips Ramsey/McCann-Erickson.
- Writing the highly successful *Bike* TV commercial with Evans Group.
- Launching multi-media campaigns for numerous consumer clients, including Safeway, Doubletree Hotels, Scottsdale CVB, VPI Pet Insurance, and New York City Animal Care and Control.
- Working with Riester~Robb on the Arizona Tobacco Education and Prevention Program, which is recognized as one of the most successful tobacco prevention programs.

Mr. Ortega has been presented with the following awards:

- Numerous local Addys and a National Addy
- Mercury Radio Awards
- Addy Writer of the Year
- Addy Best of Show
- ADWEEK Best 50 Commercials
- Featured in *World's Funniest TV Commercials* television program

Riester~Robb

Los Angeles, California

Creative Director. Mr. Ortega manages the day-to-day operations of the creative department and the development of all creative products. This includes print advertising, radio, and television commercials, outdoor boards, point of purchase, and direct mail. Accounts he has worked on include VPI Pet Insurance, Scottsdale CVB, Arizona Tobacco and Education Program, McDonalds, Popular Outdoor Outfitters, Cliff Castle Casino, Arizona Science Center, 2002 Olympic Games, California Department of Conservation, First National Bank of Arizona, and New York City Animal Care & Control.

Freelance

Phoenix, Arizona

Senior Copywriter. Mr. Ortega worked with a number of local and regional advertising agencies to help develop multi-media campaigns for their clients. These include Arizona Lottery for Evans Group; IMAX and SRP for Cramer-Krasselt; Circle K for Thomas-Tvert; Continental Homes and China Mist Iced Tea for Santy Agency; and Arizona Diamondbacks for SRO.

Tom Ortega

Texas University, Lubbock, Texas
B.A. in Communication, Arts Minor

North Texas State University
Painting and Drawing Major

Columbia School Management Program

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

Phillips Ramsey/McCann-Erickson

Phoenix, Arizona

Senior Copywriter. Mr. Ortega developed print, television, radio, point-of-purchase, and outdoor advertising for a variety of consumer clients. Clients included Doubletree Hotels, Safeway, PETsMART, Del Webb, Western Savings, and Arizona Public Service.

Crume & Associates

Dallas, Texas

Senior Copywriter. Mr. Ortega developed print, television, radio, point-of-purchase, and outdoor advertising for a variety of business-to-business and consumer clients. Clients included Ericsson Telecommunications, Texas commerce Bank, Tyler Pipe, Monarch Tile, and Harrigan's Restaurants.

DBG&H

Dallas, Texas

Copywriter. Mr. Ortega developed print, television, radio, point-of-purchase, and outdoor advertising for a real estate focused client base.

Nebe Communications

Lubbock, Texas

Production Artist. Mr. Ortega developed weekly print and television advertising for Furr's Supermarkets.

Mr. Dveirin specializes in advertising and public relations. He has launched multi-media campaigns for numerous consumer clients, including Scottsdale CVB, VPI Pet Insurance, and New York City Animal Care and Control. He has launched a multi-media campaign for the United Way that brought in record donations for that year. Additionally, Mr. Dveirin's accomplishments include working on the Arizona Tobacco Education and Prevention Program. He is recognized for working completing of the nation's most successful tobacco prevention programs.

Mr. Dveirin is a National Outdoor Advertising Award Finalist. His work is included in the International Award Publication Graphics Poster Annual, Inclusion in Print magazines Design Annual, and he has received an Addy Awards for print, broadcast, and self-promotion.

Riester~Robb

Phoenix, Arizona

Senior Art Director for a Full Service Advertising & Public Relations Agency. Mr. Dveirin is responsible for concept creation, design, and production of print advertising, radio and television commercials, outdoor boards, point of purchase and direct mail, as well as managing timelines and production staff. His clients have included State anti-tobacco campaign, Cliff Castle Casino, United Way, Tribune Newspaper, Valley Metro, Arizona Science Center, California Dept. of Conservation, DevelopOnline, Medicis, BlueCross Blue Shield, Veterinary Pet Insurance, Scottsdale Convention and Visitors Bureau, Flagstaff Chamber of Commerce, New York City Animal Care & Control, JDA Software, Fennemore Craig, Popular Outdoor Outfitters, and McDonalds.

Freelance

Portland, Oregon

Freelance Art Director for Full Service Ad Agencies Sasquatch and Nerve. Mr. Dveirin was responsible for concept creation, design, and production of broadcast and print media for Leatherman tools, Kinderfleece, Dyertech, and GST Telecommunications.

Coates Agency

Portland, Oregon

Art Director for a Full Service Advertising & Public Relations Agency. Mr. Dveirin was responsible for concept creation, design, and production of print advertising, radio and television commercials, outdoor boards, point of purchase and direct mail. His clients included Don Rasmussen Mercedes-Benz, Carl Greve Jewelers, Mercy Healthcare, Timberline Ski Resort, Standard Insurance, Multnomah Athletic Club, and Tygres Heart Shakespeare Co.

Ben Dveirin

Portfolio Center, Atlanta, Georgia
Certificate in Advertising Art Direction

Colorado State University, Colorado
B.A. in Speech Communication with a minor in Graphic Design

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

Ms. Godfrey specializes in advertising and design. Her relevant experience is detailed below.

Riester~Robb

Phoenix, Arizona

Production Artist. Ms. Godfrey produced print production of collateral materials, print ads, direct mail pieces, and more.

Meridian Advertising

Omaha, Nebraska

Associate Art Director. Ms. Godfrey supervised design and production of retail and business-to-business advertisements. She also originated materials for consistency between ads.

Senior Electronic Artist

Ms. Godfrey built advertisements while adhering to production schedules, and ensuring accurate output. She also developed production and training processes and materials.

Electronic Artist

Ms. Godfrey created retail advertisements. She also output film and PDFs for the printer.

Rick Billings Photography

Omaha, Nebraska

Digital Artist. Ms. Godfrey digitally retouched color portraits. She also restored old or damaged photographs.

Laurie Godfrey

Metropolitan Community College, Nebraska

Associate in Applied Science –Electronic Imaging and Graphics

Metropolitan Community College, Nebraska

Associate in Applied Science –Still Photography - Commercial

Licensing

Not Applicable

Task to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

Mr. Pottgen's accomplishments include leading and winning the creative pitch for Follett Bookstores with Bulldog Drummond, and helping launch the Fine Living Channel with Crispin Porter + Bogusky. Additionally, prior to advertising Mr. Pottgen served as project manager and business consultant for numerous organizations, including: The Miami Herald, the City of Chicago, RR Donnelley & Sons, and the Internal Revenue Service.

Awards Mr. Pottgen has received include:

- New York Art Directors Club – Merit
- Miami Addy – Gold
- KesselsKramer Scholarship Winner
- Leo Burnett Scholarship Winner
- Miami Ad School – Top Dog

Riester~Robb

Phoenix, Arizona

Copywriter. Mr. Pottgen participates in the creation, development, and production of creative campaigns. This includes print advertising, radio, and television commercials; outdoor boards; point of purchase; and direct mail. Accounts he has worked on include VPI Pet Insurance, Arizona Science Center, California Department of Conservation, First National Bank of Arizona, Big Brothers Big Sisters, New York City Animal Care & Control, and Casino Arizona.

Bulldog-Drummond

San Diego, California

Senior Copywriter. Mr. Pottgen created, developed, and produced ads for several national and regional accounts, including Virgin, Lee Jeans, Follett Bookstores, ConocoPhillips, and the San Diego Hate Crime Coalition. He also co-authored several market research reports, including *Millennials Explored*, *Women Explored*, and *Hip op Explored*.

Siltanen/Keehn

El Segundo, California

Copywriter. Mr. Pottgen concepted and produced TV, print, radio, and outdoor advertising for a variety of consumer clients, including Round Table Pizza and Gateway computers.

Crispin Porter + Bogusky

Venice, California

Junior Copywriter. Mr. Pottgen developed print, television, and outdoor advertising for a number of consumer and nonprofit clients, including: Bacardi, the Fine Living Channel, and PETA.

Troy Pottgen

Miami Ad School, Miami, Florida
Copywriting Graduate

Colombia College, Chicago, Illinois
Film Major

University of Illinois, Champaign, Illinois
B.S. in Business Administration

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

KesselsKramer

Amsterdam, Netherlands

Copywriting Intern. Mr. Pottgen created print and television advertising for various international accounts, including Diesel Jeans, Ben (mobile phones), and OXFAM.

Leo Burnett

Chicago, Illinois

Copywriting Intern. Mr. Pottgen wrote and produced print advertising for Handspring Visor and Morgan Stanley.

Mr. Patternoster specializes in marketing and branding. Some of his experience includes:

- Intel 386 and 486 product introductions.
- Dial Spirit Bar Soap introduction Canada, "New" Dial Soap introduction international markets.
- McDonald's Premium Salads and McGriddle's product launches.
- Idahoan Family Style Mashed Potatoes product launch.

Riester~Robb

Phoenix, Arizona

Senior Brand Planner for a Full Service Advertising and Public Relations Agency. After completing several projects for Riester~Robb as a consultant, Mr. Patternoster was hired as Senior Brand Planning Manager in 2003. In this capacity, he has executed numerous brand development proposals, recommendations, and programs; and conducted focus groups and expert interviews nation-wide. He has also developed creative briefs and worked closely with Riester~Robb's award winning creative group to deliver superior results. Some of the accounts for which he has planning responsibility include Casino Arizona, Popular Outdoor Outfitters, McDonald's, and Idahoan Instant Potatoes.

DJP Marketing Consulting

Scottsdale, Arizona

Marketing Constancy- Sole Proprietor. Mr. Patternoster opened a Marketing Consultancy. Services included brand development, new business launches, qualitative and quantitative research, creative concept development, and product design. Clients included Motorola, Medicis, Scottsdale Technologies, and Intel.

Intel Corporation

Chandler, Arizona

Mr. Patternoster held the following roles at Intel Corporation:

- As Marketing Programs Manager for the Connected P.C. Division, Mr. Patternoster was responsible for all marketing program development, and implementation.
- As Strategic Communications Manager for the Market Development Products Division, Mr. Patternoster developed and implemented all external communications strategies.
- As Sales Promotions Manager for the Semiconductor products Business Group, Mr. Patternoster was responsible for all print and electronic media, and sales promotion development.
- As Quality Marketing Manager, Mr. Patternoster was responsible for positioning Intel as a quality leader.

D.J. Patternoster

Arizona State University, Tempe, Arizona
M.S. in Business Administration

University of Chicago, Chicago Illinois
M.S. in Psychology

University of Illinois, Chicago, Illinois
B.A. in Advertising

Licensing
Not Applicable

Task to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

- As **Marketing Communications Manager,** Mr. Patternoster was responsible for market communications for Intel embedded processors.

The Dial Corporation

Phoenix, Arizona

Mr. Patternoster held the following positions at the Dial Corporation:

- **Marketing Manager of Exports**. Mr. Patternoster had full P&L responsibility for all expert business.
- **New Business/Marketing Development Manager**. Mr. Patternoster was responsible for worldwide growth of dial branded products.
- Mr. Patternoster held various product management positions including **Marketing Manager** Dial Anti-perspirant, Shelf Stable Meat, and Dial shampoo.

Ms. Watt's has achieved the following accomplishments.

- Moderated focus groups on behalf of clients including the Pennsylvania Area Transportation Authority, Arizona's Tobacco Education and Prevention Program, McDonald's, and The Iams Company.
- Interviewed top executives and industry experts for clients such as United Way, California Department of Conservation, National Soft Drink Association, Veterinary Pet Insurance, and Regence BlueCross BlueShield.
- Performed comprehensive data and competitive analysis for fifteen clients including Casino Arizona, River Rock Casino, Popular Outdoor Outfitters, and McDonald's.
- Prepared initial research proposals for thirty clients equaling an approximate seventy-five proposals.
- Summarized primary quantities and qualitative research for twenty-four clients and made personal presentations to executive management and staff to approximately twelve clients.

Riester~Robb

Phoenix, Arizona

Brand Planner for a Full Service Advertising & Public Relations Agency. Ms. Watt completes creative development research, including the investigation of consumer behavior via structured research disciplines – focus groups, one-on-one interviews, phone and online surveys, and in-field ethnographic studies for Riester~Robb. She has hands on experience in the development of participant screeners, discussion guides, surveys, and other written instruments designed to gauge consumer attitudes and perceptions. Her experience includes concept evaluation, ad testing, and other branding elements. She has also taken quantitative and qualitative research results and distilled them into cohesive behavioral profiles of target audiences and strategic marketing plans.

Ms. Watt is knowledgeable in the development of brand strategies, creative communications work plans, and creative briefs. She has also conducted impart research-supported consumer insights to clients as well as account services, creative, public relations, and media staff.

Fleming & Roskelly

Newport, Rhode Island

Intern for a Full Service Advertising & Public Relations Agency. Ms. Watt planned and developed press releases, compiled monthly clip reports, was responsible for tracking editorial opportunities, and aided in updating agency's media list for a variety of clients in the high tech, tourism and hospitality, marine, aviation, and retail industries.

Susan E. Watt

University of Rhode Island, Kingston
B.S. in Business Administration/Marketing

Boston University
Study Abroad Program – Wetland Studies and Marine Resource Management

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

Mr. Piccini's accomplishments include:

- Selecting, implementing, and maintaining the SQL Base Server and AdVantage Accounting software that schedules, tracks, and bills projects for all Riester~Robb offices.
- Drafting company-wide policies and procedures for billing, time entry and project estimation for all Riester~Robb offices.
- Maintaining sponsorship budgets, reviewing potential sponsorship options, and making recommendations for expenditure of budget for the Arizona Department of Health Services Tobacco Education and Prevention Program.

Riester~Robb

Phoenix, Arizona

Mr. Piccini has filled the following roles at Riester~Robb.

Chief Accountant. Mr. Piccini supervises the accounting department for three corporations, reporting directly to the CFO. His responsibilities include preparing monthly consolidated financial statements; organizing monthly client billing; preparing bi-monthly payroll for processing; providing support to the Traffic Department, assisting creative departments on various creative projects, and researching music for new business pitches and current clients.

Traffic Manager. Mr. Piccini created Traffic Department for each corporation; designed and enabled AdVantage Accounting Software to schedule and track all creative projects; and hired Traffic Manager to supervise department.

Springdale Village - West Healthcare

Mesa, Arizona

Staff Accountant. Mr. Piccini prepared financial statements and analysis for three facilities, supervised Accounts Payable department, prepared consolidated financial statements, completed worker's compensation paperwork, led monthly safety committee meetings, and worked directly with the Controller on assigned projects.

Accelerated Bureau of Collections

Tempe, Arizona

Collections Representative. Mr. Piccini managed a collection file of over 250 accounts for a major credit card company.

Anthony Piccini

Champlain College
B.S. in Accounting

Income Tax Assistance Program, Burlington, Virginia

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Riester~Robb

Mike Tinney

Mike Tinney, senior partner, Sierra Lake Group (SLG), has worked as business development consultant to small and emerging companies throughout California. SLG is a marketing and sales company specializing in helping small and emerging companies develop and market sustainable products through a network of independent sales representatives and distributors.

Mr. Tinney is the president of Tinney Associates, a business development consulting services specializing in new product/market introduction with an emphasis on strategic marketing planning, interim management, and sales training.

Mr. Tinney has completed the following services for client companies.

- Commercialized new technologies for California Energy Commission's PIER group.
- Provide marketing services to RMDZ companies through the CIWMB.
- Developed "by product" into national brand for leading consumer products company.
- Provided sales management/sales training services and reorganization planning.
- Assisted in the acquisition of two regional companies and managed their consolidation into a national manufacturing company.
- Served as acting CEO/General Manager to restructure privately owned manufacturer.
- Prepared business plan for Canadian company's expansion into the U.S. deck market.
- Conceived marketing plan for new business entry into residential steel framing industry.
- Developed West Coast expansion plan for an East Coast steel panel manufacturer.
- Restructure a failing business and position it for turn around.
- Negotiated purchase, financing, and operations for a retail business.
- Conducted market survey for Texas based component company's Western expansion.
- Provide recruiting services for client companies.

University of Puget Sound, Tacoma

B.A.

Licensing

Not Applicable

Task to Be Performed

- Industry and Sector Wide Assistance
- Business Assistance

Sierra Lake Group, Inc.
a sales & marketing company

Mr. Tinney's additional experience includes the following projects.

RMDZ Program

California Integrated Waste Management Board (CIWMB)

Mr. Tinney as part of the Sierra Lake Group (SLG), contracted with the RMDZ program of the CIWMB providing business assistance to RMDZ financed companies needing business planning and marketing/ sales help. These companies include SafePath Products and 3D Traffic Works, both companies producing products from recycled California tires.

The project included marketing planning for product presentation and acceptance by the State of California through the Department of General Services. Connections were also made with independent sales reps who will sell the products produced on a commission basis to the appropriate retail distribution channels.

ASC Pacific Inc.

Senior Vice President/General Manager. Mr. Tinney completed the following services in this role.

- Built single branch $6 million operation into eight branch $80 million company.
- Established six new manufacturing facilities and introduced new higher margin product lines resulting in a 60% market share increase.
- Led industry in establishing sales and manufacturing incentive programs resulting in increased productivity, decreased waste, and superior customer service.
- Created an environment where personal growth equaled business growth resulting in unprecedented retention.
- Responsible for P&L, strategic planning, budgeting and capital expenditures reporting to Board of Directors for US division of Australia's largest company.

D. G. Shelter Products

General Manager of Division. Mr. Tinney managed planning, building, and startup of a plant in Austin, Texas. Additionally, under this role he set up and supervised an international network of brokers and representatives taking annual sales from $3 million to $12 million.

Toby Toys of America

Director of Marketing. Mr. Tinney started and managed a national representative group for Toby Toys. He was responsible for promotion and production of products.

Mattel, Inc.

District Sales Manager. Mr. Tinney was responsible for sales and supervision of salesmen in a five state area. With assistance from his direction, in one year the District grew from 16th to first in the country.

Christopher Schofield

Mr. Schofield has demonstrated financial planning and business planning skills and electric power industry expertise, particularly in development and finance. He is experienced with a wide range of small businesses and startup ventures. Mr. Schofield is a principal with the Carderock Group, LLC providing strategic, transaction, and analytical services to energy industry clients. The firm also provides interim management to startup companies. Additional services Mr. Schofield provides include financial advisory services to a private equity fund investing in renewable energy, distributed power, and energy efficiency projects. His responsibilities include financial due diligence, contract review, and general financial advisory services.

Finance Consultant

Sole Proprietor. Mr. Schofield provided Financial Planning and Management Support to small business and startup companies as well as to Independent Power Producer (IPP) industry clients (domestic and international). Services include:

- Currently interim CFO for an environmental drilling company.
- Served as interim CFO for Prospectus Entertainment Ventures, LLC, a media company with the brand “Baseball Prospectus”. His responsibilities included administrative, business planning, and business development activities.
- Managed the creation of an operating period financial planning model for an IPP project located in China. Specifications included Chinese and U.S. GAAP financial statements.
- Moderated specification process and built IPP project financial analysis tool for a major international IPP company. He provided ongoing support for this tool.

U.S. Generating Company

Senior Associate/Manager, Project Finance. Mr. Schofield provided the following services for this company.

- Supervised associates conducting financial analysis.
- Responsible for quality control of financial analysis conducted in the West Coast office.
- Resolved operations, engineering, and accounting issues on development projects.
- Part of project team responsible for acquisition and restructuring of $525million coal power plant.

Dartmouth College
M.B.A.

California Institute of Technology
B.S. in Engineering and Applied Science

Licensing
Not Applicable

Task to Be Performed

- Business Assessment and Assistance

The Carderock Group, LLC.

Gary Huckabay

Mr. Huckabay is a seasoned marketing and business development professional with quantitative aptitude, a technical background, and experience in both large and developing companies.

KPMG Peat Marwick

Consultant. Mr. Huckabay performed the following services for KPMG Peat Marwick.

- Developed customer segmentation, acquisition, and attrition models for consumer credit products at financial services organizations and major retailers.
- Provided strategy, marketing analytics, and project management for three high-profile consumer financial services organizations.
- Created and executed data-driven marketing plans for companies in financial services and media/entertainment industries.

As a result, each CRM implementation engagement generated revenue of over $5 million. Additionally, the clients' customer retention increased 22 percent, and per-customer profits increased from below average to 6 percent above industry norms.

Baseball Prospectus

Senior Vice President, Marketing & Business Development. Mr. Huckabay performed the following services under this contract.

- Founded an integrated sports media and consulting firm which produced a bestselling baseball annual book, a highly successful subscription-based web site, and a syndicated radio show.
- Developed & Negotiated channel partnerships with industry leaders, including ESPN and Microsoft.
- Designed and developed forecasting models for player performance and financial contribution.
- Managed relationships with industry analysts, publishers, developers, and vendors.
- Co-authored 10 editions of the flagship Baseball Prospectus annual book (1996-1999, 2001-2006).

As a result, Baseball Prospectus is a nationally recognized brand in the industry. The annual book is the No.1 annual book in fantasy baseball, with sales volumes reaching numerous bestseller lists including No.4 at Amazon, No.8 at Washington Post, and AC Nielsen BookScan. Additionally, the web site has attracted thousands of paying customers.

Revionics

Director of Product Marketing. Mr. Huckabay performed the following services under this contract.

U.C. Davis, California
M.B.A.

U.C. Davis, California
B.A. in Political Science

Licensing
Not Applicable

Task to Be Performed
- Business Assistance

The Carderock Group, LLC.

- Co-developed an enterprise-scale price optimization solution for the retail industry.
- Managed entire product lifecycle, including design, development, testing, beta, rollout, and sales for a rapidly growing startup company.
- Wrote MRD, specifications, white papers, and other marketing materials.
- Helped raise capital investment by clearly presenting complex algorithmic and technical materials to non-technical audiences at venture capital firms.

As a results, the clients are enjoying significant gains in topline revenue and margins, and the company is growing rapidly.

Oakland Athletics Baseball Club

Data & Operations Consultant. Mr. Huckabay performed the following services under this contract.

- Advisor to A's General Manager, Billy Beane on contracts, trades and acquisitions, finances, and forecasts.
- Developed proprietary quantitative models and forecasts of player performance (major and minor league) and team finances to optimize operational management decisions for a Major League Baseball club.

As a result, models and forecasts were used to prepare team strategy for player valuation, first-year player drafts, and salary arbitration cases. Additionally, Mr. Huckabay won arbitration case vs. Juan Cruz, saving the company $260,000.

Vivendi Universal Online

Director of Database Marketing. Mr. Huckabay performed the following services under this contract.

- Developed and negotiated channel and marketing agreements with numerous strategic partners.
- Responsible for customer segmentation and acquisition for very large company offering online games and entertainment.
- Managed direct marketing projects to over $7 million recipients via email and direct mail.
- Managed restructuring and integration of marketing team during Uproar acquisition.
- Produced industry intelligence reports (AC Nielsen, PC Data, etc) for executive briefings.

As a results of this contract, the ROQ increased on ad spend by over 100 percent in four months through implementation and analysis of user tracking, segmentation, and redirection of media buys. Additionally, advertising revenue levels were maintained during industry-wide advertising decline and strategic relationships were established and developed which resulted in new revenue in excess of $1 million.

NBC Internet

Senior Product Marketing Manager. Mr. Huckabay performed the following services under this contract.

- Designed and implemented customer acquisition, tracking, retention, and ROI models for all marketing programs for the online division of a major television network.
- Led all market research for flyswat product, including focus groups, surveys, observational online tracking, and statistical analysis of user behavior.

- Worked with engineering to build multi-terabyte data warehouse & ad hoc reporting for marketing.
- Created MRDs including user profiles, market segments, and use-case scenarios.
- Managed product development and user interface teams following acquisition and restructuring.

As a results, there was a 21percent increase in user retention, with concomitant profit increase.

Delphi Information Services

Founder/Principal. Mr. Huckabay played the following role in this contract.

- Founded company providing database systems for small and medium-sized businesses.
- Account manager and business analyst for key clients.
- Designed and developed database applications including patient handling for optometrists, inventory control for record stores, billing systems for attorneys.
- Managed, recruited, and trained development staff.

As a result of this contract there was a dramatic efficiency and profit increases for clients.

PBI Software

Marketing Manager. Mr. Huckabay performed the following services under this contract.

- Managed groups responsible for new product development, market research, promotions, and pricing analysis for a company producing consumer software.
- Supervised four channel sales personnel.

As a result, the company successfully marketed five bestselling titles in two years.

Mr. Chow is founder of the Carderock Group which provides strategic and financial advisory services to companies, with a focus on start up entities. He served in interim management role as the top executive in several startup and turn around situations. Mr. Chow's major engagements are listed below.

PPL Corporation

A Fortune 500 electric utility based in Allentown, Pennsylvania. Mr. Chow is serving as co-leader of M&A effort, leading origination, structuring, and closing of target transactions. He is also responsible for business development in the Pacific Northwest and California (serving as an interim Regional Director)

Prospectus Entertainment Ventures (Baseball Prospectus)

Baseball Prospectus is a small, but nationally recognized baseball metrics and opinion content company. Mr. Chow is advising the company on business planning, valuation, financing, and possible transactions.

Invensys Goodwatts

Invensys Goodwatts is a startup company within a large corporation focused on energy technology conservation. Mr. Chow advised the company on their business plan, market entry, and financing.

Neospine

Neospine is a startup ambulatory surgical chain focused on minimally invasive procedures for the back. Mr. Chow developed the business plan, raised the initial seed capital, and recruited the management team.

Knowledge Ventures

Knowledge Ventures is a startup company developing education software tools. Mr. Chow served as the lead executive as well as a Board member. He raised a follow-on round of financing and led sale of key assets to Fortune 500 company status.

American Water

American Water is the largest privately owned water company in the U.S. Mr. Chow was responsible for originating, structuring, and closing on transactions in the Western U.S. He was also responsible for reviewing and further developing the existing strategy.

Rocky Mountain Institute (RMI)

Rocky Mountain Institute is a leading energy consulting firm focused on distributed generation and renewable energy. Mr. Chow advised the company on business development initiatives. Additionally, he worked on the Nebraska Public Power District, developing a dispatch curve and assessing potential supply risks.

Richard Chow

Yale University School of Management, New Haven, Connecticut
M.B.A.

Wesleyan University, Middletown, Connecticut
B.A. in Government and American Studies

Licensing
Not Applicable

Task to Be Performed

- Business Assessment and Assistance

The Carderock Group, LLC.

EnergyWorks, Joint Venture of Bechtel Enterprises and PacifiCorp

Asia Office, Jakarta, Indonesia

President. EnergyWorks develops energy solutions for commercial and industrial customers that are Fortune 500 and multinational corporations. In March 1999, EnergyWorks was sold to Iberdrola, one of the leading Spanish electric utilities. Under this contract, Mr. Chow completed the following.

- Established and operated the first overseas office, including the hiring and training of all staff (14 individuals) and the securing of all licenses and approvals.
- Led M & A activities and originated energy management contracts with leading commercial and industrial customers valued at U.S. $30 million in Indonesia and the Philippines.
- Seconded to PacifiCorp/PowerCor to head up M & A activities in Southeast Asia.

EnergyWorks, Joint Venture of Bechtel Enterprises and PacifiCorp

Landover, Maryland

Director of the Business Development Group. Under this contract, Mr. Chow completed the following:

- Conceived and executed the startup strategy as part of the original management team.
- Raised $200 million in startup equity and debt.
- Sourced U.S. $35 million of wind power deals.

U.S. Generating Company (USGen), Joint Venture of Bechtel Enterprises and PG&E

Bethesda, Maryland

Manager, Environmental Affairs & Business Development Group. USGen was founded in 1989 as the unregulated subsidiary that develops independent power projects (IPP). Now a wholly owned subsidiary of PG&E, known as PG&E NEG, it has over U.S. $10 billion in assets and 10,000 MW under operations. Under this contract, Mr. Chow completed the following.

- Developed, marketed, and implemented energy-efficiency, renewable energy, and environmental mitigation projects (CO2 offset, wetland restoration, biomass, wind, and solar).
- Led the community relations and involved with the subsequent negotiation efforts for the Hermiston Project.
- Managed key development and permitting activities for several projects, representing over $1.5 billion in financing.
- Designed the New Delhi Energy Center (India), an energy efficiency and renewable energy showcase in a seconding arrangement to International Generating Company (InterGen).

John Resing, P.E.

Mr. Resing is a Section Manager at UL, an independent, not-for-profit organization that provides world-class product safety and certification testing.

Underwriters Laboratories Inc (UL)

Northbrook, Illinois

Section Manager - Fire Protection Division. Mr. Resing is Section Manager for operations associated with the Wire and Cable, NEBS, Building Materials, Roofing, and Furnishings categories. He has delivered an immediate impact on performance management, cost savings, and quality of laboratory data. Mr. Resing's role includes directing daily operations while improving the operation through a time of change.

Mr. Resing managed 15 direct reports in the Reaction to Fire Laboratory through major change initiative after division reorganization. He had technical responsibility for standard test methods relating to heat and smoke release rate, surface burning characteristics, and wind resistance of building materials. Mr. Resing's achievements in this position include:

- 12 percent cost of revenue savings YTD through analysis and implementation of cost savings measures.
- 20 percent improved efficiency through automation and systemization of all major test areas.
- Improving turn around time from 14 to five days by tying division goals to individual performance appraisals.
- Coordinating major equipment upgrades including construction of a large scale calorimeter, computer hardware, software, and LAN replacement.

Underwriters Laboratories Inc.

Northbrook, Illinois

Engineering Group Leader - Fire Protection Division. Under this role, Mr. Resing managed engineering and laboratory operations in the evaluation of building products. He tied individual goals to corporate and division goals, improved test processes for accuracy of results, and automated and streamlined reports. Mr. Resing was involved in major fire protection initiatives including research projects, interlab round robin testing, international expansion, and the leadership team.
Mr. Resing's key accomplishments include:

- Managing $4.3 million gross revenue group with 15 direct reports involved in product investigations of building materials to nationally recognized codes and standards.
- Leading effort for automated reporting which resulted in issuance of test reports within minutes of completion of testing.

Illinois Institute of Technology, Chicago

M.S. in Mechanical and Aerospace Engineering

University of Dayton, Ohio

B.S. in Mechanical Engineering

License

Professional Engineer, New York and Illinois

Tasks to Be Performed

- Product Testing and Certification Services for Business Assistance
- Industry and Sector Wide Assistance

- Managing turn around time from sample receipt to client report of 2 weeks or less for wire and cable and NEBS areas by tying division goals to individual performance appraisals.
- Delivering high levels of customer satisfaction as measured by customer surveys.

Royal Bedding Company of Buffalo Inc.

Buffalo, New York

Operations Manager. Mr. Resing turned around a manufacturer in critical condition by hiring and firing staff, upgrading machinery, improving the physical plant, and changing/systemizing processes. Additionally, he added production capacity and increased efficiency in anticipation of increased sales volume. Mr. Resing was responsible for all aspects of the manufacturing operation including profit and loss of factory, customer service, inventory and ordering, production, shipping, and interfacing with suppliers and sales people. As a result, he affected major cost improvements, increased production, decreased backorders, and re-merchandised product lines. Key achievements of this project for Mr. Resing included.

- Managing $5 million wholesale bedding manufacturing, warehouse, and Distribution Company.
- Supervising 20 production employees, 3 supervisors, 3 office personnel, maintenance people, and contractors.
- Cost improvements totaling 5.5 percent of sales from year ended 2001. Recurring annual cost savings totaling 3.5 percent of sales in process improvement, labor, and material cost.
- Specific measured improvements include:
  - 99.8 percent on time delivery rate – 72 percent improvement from historical average.
  - Improved labor productivity 8percent.
  - Reduced factory overhead 16 percent, lowered inventory 25percent.

Underwriters Laboratories Inc.

Northbrook, Illinois

Senior Project Engineer – Fire Protection Department. Mr. Resing managed engineering projects for testing, evaluating, and modeling fire resistive constructions for installation in accordance with national codes and standards. He initiated a plan to increase thermal and structural computer modeling into product testing. Models were developed using numerical methods and the ANSYS FEA program. Mr. Resing's key achievements for this project include:

- Managing multiple complex engineering investigations of large structural assemblies.
- Developing new business using computer models in fire test investigations.

Underwriters Laboratories Inc.

Northbrook, Illinois

Project Engineer - Fire Protection Department. Mr. Resing managed engineering to determine compliance with building and fire codes. He designed test programs, performed engineering analysis, coordinated lab and office personnel, evaluated test results, and wrote reports. Mr. Resing was responsible for all client interaction, including proposals, costing, scheduling, and client relations.

Mr. Resing's key achievements on this project include:

- Handling up to 30 smaller test investigations simultaneously in a high volume, fast turn around environment.
- Increasing productivity by developing computer program in Access to automate cable fire testing and reporting.

Underwriters Laboratories Inc.

Northbrook, Illinois

Associate Project Engineer - Chemical and Casualty Hazards Department. Mr. Resing examined products related to the distribution and storage of flammable liquids and related chemicals.
He supervised and trained lab staff, and conducted on site testing and evaluations of manufacturer's products to determine compliance with UL's requirements.

Thomas Z. Fabian, Ph. D.

Mr. Fabian's technical experience includes the following areas of expertise.

- **Polymer Analysis and Characterization.** Mr. Fabian is experienced at analyzing a variety of filled and unfilled polymeric and rubber compounds. Additionally, he has hands-on experience with a wide range of analytical techniques including:
  - Mechanical properties: Tensile & flexural properties (Instron); Tear and Impact strength.
  - Thermal analysis: Transitions (DSC); Polymer degradation (TGA); Dynamic mechanical (DMTA).
  - Spectroscopy: FTIR; Fluorescence; UV/Vis; and Microscopy: Optical; SEM; AFM.
  - Surface analysis: ATR-FTIR; Ellipsometry; XPS/ESCA; Tensiometers; Pendant drop; Contact angle.
  - Textile science: Fabric structure & performance – durability; permeability; breathability; strength.
  - Sample preparation: Blending; Compression molding; Thin film coatings (spin, solvent cast, knife).
  - 5+ years of Class 100 clean room experience.
- **Test Method Development and Laboratory Management.** Mr. Fabian developed six new material and product performance test methods – two test methods in review for AATCC national standardization and one method submitted to ASTM for national standardization. Additionally, Mr. Fabian is experienced at applying ISO 9002 procedures – authored 7 ISO 9002 registered SOP. He has developed and improved data analysis methods, and created material and product properties databases; managed scheduling and output of industrial analytical laboratories with focus on safety and efficiency; supervised laboratory technicians in industry, and trained students in laboratory classes at the university level.
- **Statistical and Numerical Analysis.** Mr. Fabian has experience using statistical data analysis to evaluate polymer/textile properties to compare product performance. He is also experienced at using design of experiments methods for product and materials development.
- **Product and Process Development.** Mr. Fabian developed five new products with innovative polymer coatings and encapsulation process technology. He also worked on several cross-functional teams to improve product development cycle times and process yields.
- **Customer Service, Sales and Marketing.** Mr. Fabian has over five years of experience direct interfacing with customers and vendors for product improvement. He has worked on several teams for

University of Connecticut
Ph.D. in Polymer Science

Carnegie Mellon University
B.S. in Chemical Engineering

Licensing
Not Applicable

Tasks to Be Performed
- Product Testing and Certification Services for Business Assistance
- Industry and Sector Wide Assistance

developing marketing strategies and sales plans, and budgeted manpower and resources to meet company needs and enhance employee satisfaction.

Underwriters Laboratories, Inc.

Northbrook, Illinois

Research Engineer. Mr. Fabian acted as principal material scientist with the Fire Protection Division. His responsibility included acting as technical advisor and reviewer for analytical and small-scale combustibility laboratories and co-developer of new technique for *in situ* characterization of smoke formation and composition. Mr. Fabian was the in-house specialist on textile, composite decking, and barrier materials.

REI

San Diego, California

Sales Specialist. Mr. Fabian coordinated programs to increase sales and improve customer satisfaction. Through his work, annual sales of product categories increased by 20-38 percent. Additionally, he trained sales staff and managers on product knowledge, merchandising, and sales technique; and acted as in-house consultant on polymer and textile material performance.

Nextec Applications, Inc.

Vista, California

Research Scientist. Mr. Fabian was the principal material and surface science researcher at a venture capital funded company that uses proprietary silicone and fluorocarbon based polymer encapsulation coatings to make specialty textiles for the outdoor apparel, medical, automotive, aerospace, and electronics industries. Under this role, he acted as achieved the following:

- Technical lead for outdoor apparel product development – developed 4 apparel and 1 biobarrier products.
- Significantly improved water repellency and resistance durability, developed their most breathable/water resistant product, 1st successful non-woven textile encapsulation.
- Contributed significantly to the success of Nextec's first profitable product (thermal transfer blanket).
- Managed materials analysis of Nextec's and competitors' products to support in-house product development, marketing strategy development, and to provide evidence for successful patent infringement litigation.
- Led teams for developing new analytical test methods for product & process improvements:
  - Introduced new breathabilty testing resulting in annual savings of $1.2 million (2 week ROI).
  - Devised a new permeability test that reduced product acceptability testing from 30 hours to 5 minutes.
  - Established internal field testing program to shorten apparel product development cycle time.
- Initiated and managed research projects with academic, government, and professional institutions to advance understanding of encapsulation technology and benefits.
- Represented Nextec at trade shows and technical conferences. Created numerous interactive technology displays used in trade shows, promotions, and sales site sellers.

IMS Associates Program

Storrs, Connecticut

Research Assistant. Mr. Fabian performed contract research for corporate product development including:

- Characterizing ultra-thin multi-layer polymer/oxide/metal films by spectroscopic ellipsometry and AFM.
- Improving adhesion of coating to carbon-fiber reinforced composite by modifying surface with UV/ozone.
- Evaluating spectral intensity response and durability of prototype electroluminescence devices.

Polymer Science Program

The University of Connecticut, Connecticut

Research Assistant. Mr. Fabian performed nonradiative energy transfer experiments and simulations for in situ determination of degree of mixing and compatibilization in polymer blends. He developed a novel mathematical model to analyze polymer blend mixing and compatibilization, and synthesized and characterized thin multi-layer films of functionally labeled polystyrene, acrylics, and blends.

Pravinray D. Gandhi, Ph.D.

Mr. Gandhi has a wide range of experience in working with multi-disciplinary teams to initiate research ideas and conduct research. His experience also includes an understanding of standards making and regulatory environment, national and international testing protocols.

Mr. Gandhi has led multi-disciplinary teams to introduce several leading edge technologies at Underwriter Laboratories (UL) that includes CFD, thermal and structural fire modeling; thermal property measurements at elevated temperatures; heat release calorimetry; sprinkler spray droplet and velocity distributions; commodity hazard measurement; large-scale fire testing; and electronic reliability measurements.

Mr. Gandhi has designed and implemented an Oracle based test data automation system that archives test data and enables importing of data into MS Office documents through Visual Basic programming.

Underwriters Laboratories Inc.

Northbrook, Illinois

Director, Business Development. Mr. Gandhi's current responsibilities include:

- Providing technical project review.
- Managing Solutions Group operations.
- Developing research opportunities.
- Developing new standards.
- Identifying new business initiatives.
- Improving Fire Protection Division's data archival and retrieval infra-structure.

TELCO

India

Research engineer in truck manufacturing industry. Mr. Gandhi tested and designed pneumatic and hydraulic control system components. Additionally, he established acceptance criteria for contracted components.

Skills/Strengths

- Codes, standards, and government regulations.
- Data analysis using phenomenological modeling of fire, thermal, and physical processes.
- Testing using standard test methods (ASTM, NFPA, ISO, IEC, NEBS, etc.).
- Fire hazard and risk assessment methodologies.

University of Notre Dame, Norte Dame

Ph.D. in Mechanical Engineering

University of South Carolina

M.S. in Mechanical Engineering

Indian Institute of Technology, New Delhi, India

B.Tech in Mechanical Engineering

License

Civil Engineer in Illinois

Tasks to Be Performed

- Product Testing and Certification Services for Business Assistance
- Industry and Sector Wide Assistance

- Network of engineering, regulatory, and enforcement authorities.
- Instrumentation and automated data acquisition.
- Advanced Programming skills: Visual Basic, SQL, VBA, FORTRAN.
- Software proficiencies: Excel, Word, MS Project, Access, PowerPoint, Outlook, Lotus Notes.
- Oral and written communication and presentation skills.

Karen Dubiel

Ms. Dubiel is a Research Engineer for Underwriter Laboratories (UL), an independent, not-for-profit organization that provides world-class product safety and certification testing.

Underwriters Laboratories Inc.

Northbrook, Illinois

Research & Development, Research Engineer. Ms. Dubiel's duties include providing technical support for many UL organizations, including CAS, PDE, Chief Engineer's Office, Field Reports, and various SBUs. Her focus since joining R&D has been to provide technical support (including development of XRF technology) and develop the operational aspect of Restricted Substances Compliance Solutions (RSCS) program.

Underwriters Laboratories Inc. (UL)

Northbrook, Illinois

Conformity Assessment Services, Engineering Group Leader. Ms. Dubiel's work included responsibility for workload and budgets for the six members of her team, and herself; preparation of Capital Expenditure Budget Item requests and development of new business opportunities; responsibility for preparing Employee Evaluations (quarterly and yearly); and standards writing.

Underwriters Laboratories Inc. (UL)

Northbrook, Illinois

Conformity Assessment Services, Engineering Assistant, Associate Project Engineer, Project Engineer, and Senior Project Engineer. Ms. Dubiel's work included the following product categories: Plastics, Insulation Systems, Wire Positioning Devices, Magnet Wire, Varnishes, Laboratory Hoods and Cabinets, and Batteries. Her work included investigations of products for compliance with UL Standards for Safety, and engineering project review.

She is one of the technical experts for plastics, particularly in the application of UL 746C. Her other responsibilities included assignment as primary designated engineer for two product categories (Laboratory Hoods and Cabinets, and Joint Sealing Compounds and Seal Materials), and engineering recruiting.

Milwaukee School of Engineering
M.S. in Engineering, Materials Specialty

Central Michigan University
B.S. in Mathematics/Chemistry

Licensing
Not Applicable

Tasks to Be Performed

- Product Testing and Certification Services for Business Assistance
- Industry and Sector Wide Assistance

Daniel Steppan

Mr. Steppan began career at Underwriters Laboratories Inc. (UL) in 1993 after working in the aerospace industry for four years in component and system design engineering. He currently holds the position of Senior Project Engineer at the Northbrook, IL fire test facility in the Large Scale Fire Research department.

Mr. Steppan's project handling experience includes UL Listings in the fire suppression area of clean agent fire suppression, sprinkler systems, pallets and wood plastic composite decking, and guardrail systems.

He has developed safety Standards for Plastic storage pallets, both for fire performance as well as physical performance. Additionally, he has been involved in the evaluation of current and newly developed outside standards relating to wood plastic composite decking.

University of Illinois, Chicago

B.S. in Mechanical Engineering

License

Professional Engineer in Training

Tasks to Be Performed

- Product Testing and Certification Services for Business Assistance
- Industry and Sector Wide Assistance

Alan Moreland, Ph.D.

Mr. Moreland, Ph.D. is an independent ground rubber broker and a consultant specializing in ground rubber production systems and tire-derived product markets. His expertise covers the full range of ground rubber, from coarse to ultra-fine. In addition to a sound technical grounding, he has broad experience in manufacturing quality systems, sales, marketing, and product development, especially in the rubber recycling area.

For the past two years, Mr. Moreland has provided consulting services to several rubber recycling firms located throughout North America, has pursued market expansion opportunities with several customers, and has provided ground rubber brokerage services. Mr. Moreland now operates as an independent sales broker and consultant for several recycling companies, and also pursues market development opportunities with potential customers. Most recently he has served as Chairman of the Rubber Recycling Topical Group of the ACS Rubber Division.

Market Development Projects

Mr. Moreland's market development projects include:

- Market survey of the use of crumb rubber in molded products. (Eastern U.S.)
- Development of product allowing use of fine crumb rubber in PG asphalt.
- Expand market for crumb-rubber-based air diffuser hose by increasing chemical resistance.
- Use of non-cryogenically ground crumb rubber in premium turf fields.

Consulting Projects

Mr. Moreland's consulting projects include:

- Technical development of a cryo grinding line for tire rubber and butyl.
- Technical development of a wet grind line for tire rubber and butyl.
- Technical/quality improvements for a cryo grinding line.
- Development of a dust-free crumb product to reduce fire/explosion hazard

Purdue University
Ph.D. in Analytical Chemistry

Princeton University
B.A. in Chemistry

Licensing
Not Applicable

Tasks to Be Performed

- Industry Specialist
- Industry and Sector Wide Assistance

Industry Specialist

Project Experience

Independent Sales Broker/Consultant (Rubber and plastics recycling)

Crosston Rubber (Quebec) (Startup Rubber Recycling, Chinese technology)

Vice President, Sales & Marketing

Rouse Polymerics (Rubber/Polymeric Material Recycling)

Sales and Marketing Manager. (Sales and Marketing for a 40mm lbs/year) Mr. Moreland was the Sales and Marketing Manager of this industry-leading operation until a fire and explosion on 16 May 2002 ended operations.

EPS, Inc. (Rubber Recycling)

Charleston, South Carolina

Vice President, Market Development. Mr. Moreland was responsible for technical marketing, sales support, and process development.

NRI, Inc. (Rubber recycling)

Vice President R & D, Sales. Mr. Moreland worked on process optimization, market development.

Westeck, Inc.

Director of Research & Development. Mr. Moreland led a team of three engineers and four technicians in the development of new textile reinforcements for manufactured rubber goods. He was responsible for product and process development in a 500 person manufacturing facility. His expertise includes industrial textile products and adhesion systems.

Michelin Tire Corporation

Lexington, South Carolina

Technical/QA Manager. Mr. Moreland directed team of 115 employees in a tire plant producing over 20,000 units daily. He also managed all quality audit requirements of auto manufacturers. Mr. Moreland is well versed in ISO 9000 implementation.

Michelin Tire Corporation

Dothan, Alabama

Technical/QA Manager, Mr. Moreland directed a team of 75 employees in a tire plant producing over 4,000 units daily. He also developed a cross-functional team structure to successfully integrate new products into manufacturing.

Gene Morris, P.E.

Mr. Morris, a pioneer in the Asphalt-Rubber industry, elevated the McDonald process from the city level to the state usage in the 1970s. During his 21 year career with the Arizona Department of Transportation, Mr. Morris served in several capacities; Resident Engineer, Sr. Resident Engineer, Asst. District Engineer in the Phoenix District; Assistant State Engineer, Quality Control; Engineer of Research and Director, Arizona Transportation Research Center. In these roles, Mr. Morris was instrumental in the development of Arizona's Asphalt-Rubber Systems, which draws representatives of governments and agencies around the world to visit Arizona and look at the Asphalt-Rubber work.

Mr. Morris also worked in the private sector with engineering firms like Western Technologies, Boduroff & Meehan Consulting Structural Engineers, as well as the Portland Cement Association.

Mr. Morris is a member of the Recycled Tire Research and Engineering Foundation. He is dedicated to exploring the beneficial use of crumb rubber, processed from waste/scrap tires, in paving materials and other construction applications, proving the engineering merits and providing technology transfer to appropriate agencies throughout the world.

Mr. Morris is the recipient of numerous other awards including the American Society of Civil Engineers (ASCE), Fellow, 1965; American Society of Professional, Engineer of the Year, 1979; ASCE, Arizona Section, Outstanding Civil Engineer, 1988; Association of Asphalt Paving Technologists, W. J. Emmons Award, 1982; Arizona Department of Transportation, Directors Award for Meritorious Achievement, 1982; Institute of Management Science, Award for Pavement Management System, 1982 and the Rubber Pavements Association, Pioneer Award, 2002.

Mr. Morris has written many technical papers. His determination to investigate the facets of engineering possibilities led to the introduction of new engineering concepts.

University of Arizona
Civil Engineering

Licensing
Not Applicable

Tasks to Be Performed

- Business Assistance
- Industry and Sector Wide Assistance (analysis of rubberized asphalt concrete products and engineering applications)

George B. Way, P.E.

Arizona State University
Post Graduate studies in Pavement Design, Materials Testing, Statistics, and Business
B.S. in Chemical Engineering

Licensing
Registered Civil Engineer, Arizona

Tasks to Be Performed

- Business Assistance
- Industry and Sector Wide Assistance (analysis of rubberized asphalt concrete products and engineering applications)

Mr. Way is a currently member of the Recycled Tire Engineering and Research Foundation. The foundation is dedicated to exploring the beneficial use of crumb rubber, processed from waste/scrap tires, in paving materials and other construction applications, proving the engineering merits and providing technology transfer to appropriate agencies throughout the world.

Mr. Way was employed as engineering supervisor and manager for the Arizona Department of Transportation (ADOT) from 1969 until 2004. In this role, he supervised and managed the Pavement Design Section composed of 12 employees, including other registered Civil Engineers, responsible for preparing pavement designs for all ADOT paving projects. His work load typically represented 100 projects per year, valued at over $400 million dollars of construction.

Mr. Way retired in 2004 from the Arizona DOT as the Chief Pavement Design Engineer with 35 years of experience in Pavement Design, Materials Testing and Pavement Management. More specifically this experience involves all facets of Pavement Structural Design, Materials Testing, Materials Pavement Research, Pavement Condition Inventory, Pavement Management, Asphalt and Asphalt Rubber Mix Design, Concrete Mix Design, and all related materials composing the pavement structure from the soil foundation to the surface of the pavement.

His experience includes being active in the research and implementation of asphalt rubber at the Arizona DOT. He developed an expertise in all aspects of asphalt rubber including its components, mix design, pavement structural design, and unique materials properties. He has spoken and lectured all over the world as an expert advocate for the beneficial use of asphalt rubber. Such uses include the ability of asphalt rubber to reduce reflective cracking, provide a very durable wearing course, reduce surface maintenance, provide a very smooth riding surface, provide a good skid resistant surface, reduce splash and spray, and reduce noise.

Mr. Way was also instrumental in the successful implementation and wide spread use of asphalt rubber open graded and gap graded mixes throughout Arizona.

Mr. Way is presently providing consulting services on all aspects of Pavement Design, Materials Testing and Pavement Management with an emphasis in the asphalt rubber area.

Representative Experience

Mr. Way's key experience includes

- 35 years of progressive experience in pavement design.
- Designed/reviewed over 1,500 highway paving projects including Interstate Highways, primary/secondary highways, new construction

with either hot mix asphalt or concrete, overlay projects, consultant designs, local government designs, state park and rest area project designs.

- Expert in the use of AASHTO Pavement Design, AASHTO Pavement Design Program Darwin, Arizona Overlay Pavement Design Program SODA, 2002 AASHTO Mechanistic Design, subgrade soil support and base R-Value Analysis Program and Arizona DOT Materials Preliminary Engineering and Design Manual.
- Experience in Flexible Hot Mix Asphalt and Concrete Pavement Design pavement designs.
- Experience in Quiet Pavement, Asphalt Rubber Pavement Project designs.
- Experience in Ultra Thin Concrete White-topping project designs and design and use of fibers in concrete such as fiberglass and polypropylene and crumb rubber concrete.

Kamil Kaloush, Ph.D., P.E.

Mr. Kaloush is a member of the Recycled Tire Engineering and Research Foundation. He is dedicated to exploring the beneficial use of crumb rubber, processed from waste/scrap tires, in paving materials and other construction applications, proving the engineering merits, and providing technology transfer to appropriate agencies throughout the world.

Mr. Kaloush is also a member of a multidisciplinary research group, Sustainable Materials and Renewable Technologies Program, ASU. He has participated in the development of a Pavement Management System computer program, used in a graduate course; and the development of instrumentation protocols for asphalt mixtures testing.

Project Experience

- Ministry of Communications
  Sultanate of Oman
  Maintenance Management Systems Expert and Directorate General of Roads
- Technical Assistance Team Member to the Ministry of Communications
  Sultanate of Oman.
  Maintenance Management Systems Engineer and Consulting Engineers
- CTL International Inc.
  Columbus, Ohio
  Senior Research Engineer
- Resource International, Inc.
  Columbus, Ohio
  Department Head, Pavement Management Services and a Project Engineer

Service

Journal Review

- American Society of Civil Engineers – Journal of Materials in Civil Engineering / Transportation.
- Association of Asphalt Paving Technologists
- Transportation Research Board
- Canadian Journal of Civil Engineering
- The International Journal of Pavement Engineering
- Journal of ASTM International

National Council of Examiners for Engineering and Surveying

- Civil Engineering Examination Committee (Transportation Exam Review and Assembly)

Arizona State University
Ph.D. in Civil Engineering

Ohio State University
M.S. Civil Engineering

Ohio State University
B.S. Civil Engineering

Licensing
Registered Professional Engineer

Tasks to Be Performed

- Business Assistance
- Industry and Sector Wide Assistance (analysis of rubberized asphalt concrete products and engineering applications)

Committees

- Pacific Coast Conference on Asphalt Specifications (PCCAS), Paving Asphalt and Mix Committees
- Committee AFK50, Transportation Research Board

International

- Technical Committee Member, Asphalt Rubber 2003 Conference, Brasilia -Brazil
- Technical Committee Member, Asphalt Rubber 2006 Conference, San Diego, California

Affiliations

- Technical Advisory Board Member, Rubber Pavement Association, Tempe, Arizona
- ASU, ASU/ADOT/Industry/Local Governments Planning Committee
- Member, Search committee – Faculty position in CEE
- Member, CEE 486 Senior Design Project Committee
- Member, CEE Academic Affairs Committee
- 2003 /04 Arizona State University, Speakers Bureau / Experts List
- Affirmative Action Representative
- Faculty Representative – United Way

Journal Publications

Additionally, Mr. Kaloush has published numerous Journal articles including: “Sustainable Engineering’s”, “Distress Assessment of Conventional HMA and Asphalt Rubber Overlays on PCC Pavements using the Mechanistic-Empirical Design of New and Rehabilitated Pavement Structures”, “Properties of Crumb Rubber Concrete”, "Microstructural Viscoplastic Continuum Model for Asphalt Concrete", “Thermal Properties of Asphalt Mixtures”, and “Reduced Confined Dynamic Modulus Testing Protocol for Asphalt Mixtures”. He has also conducted peer reviewed conference publications, invited talks, completed conference presentations, completed student advising, conducted research projects, and completed reports.

John H. Fearncombe

Mr. Fearncombe is the President and Founder of Bottom Line Consulting (BLC). Prior to founding BLC, Inc. in 1987, John had eighteen years of combined industrial experience at Norchem (Equistar Chemicals) and BASF Corporation. His experiences encompass all the major thermoplastics and multi-layer structures, plus recycling and separation technologies.

Bottom Line Consulting, Inc.

Lake Barrington, Illinois

Founder and President. Bottom Line Consulting, Inc. is an independent firm that adds value to companies in the plastics and recycling industries. The firm specializes in:

- Devising custom formulations to reduce cost and enhance performance.
- Trouble-shooting of processing and performance problems.
- Developing competitive advantages through technical innovation.
- Fast-tracking the commercialization of recycled-content products.
- Providing expert opinion and due diligence services.

Recent specialized consulting projects include:

- Providing expert opinions and testimony on polyethylene and polyvinyl chloride court cases.
- Establishing custom formulations for plastic and rubber products.
- Developing state-of-the-art products for the telecom and correctional industries.
- Troubleshooting weathering, blistering, and shredding problems for various clients.
- Matching plastic materials and processing for competitive cost advantages.
- Specifying additives and suppliers that optimize product performance.
- Developing cost standards for plastic material, formulations, and process.
- Conducting seminars on resin chemistry, processing, and value-added products.
- Creating specification-grade products from recycled plastics.
- Determining the commercial recyclability of multi-layer containers.

Wayne State University

M.B.A in Finance
B.S. in Chemical Engineering

Senior Member, Society of Plastics Engineers

Tasks to Be Performed

- Industry Specialist
- Business Assistance

Partial Client List

- Alloyd Company, Inc.
- American National Can Company
- American Plastics Council
- Argonne National Laboratory
- Bath and Body Works
- R. W. Beck
- Canuck Compounders Inc.
- Charles Industries, Ltd.
- Clear Pack Company
- Clearplas Containers, Inc.
- De Ster Corporation
- Fabri-Kal Corporation
- Inland Container Corporation
- Innovative Plastics Corporation
- M & M/Mars
- National Polystyrene Recycling Company
- National Association for Plastic Container Recovery
- Nebraska Plastics
- Olcott Plastics
- Pure Tech Plastics, Inc.
- Rexam Beverage Can Company
- Ross Products Division of Abbott Laboratories
- Silgan Containers Corporation
- Stanford Research Institute
- Stericycle Inc.
- Sunbeam Plastics
- Suncast Corporation
- Tulip Corporation
- Traex Division of Menasha Corporation
- Transparent Container Company, Inc.
- U.S. Plastic Lumber
- The Vinyl Institute
- Willow Plastics
- Xerox Corporation

Norchem/Enron Chemical

Omaha, Nebraska

Manager, Business Development. Under this role, Mr. Fearncombe completed the following:

- Completed business/technical evaluations of acquisition candidates; computed present value from business model based on seller product mix, cost position, and technology.
- Directed internal expansion projects from conception through implementation; coordinated marketing, sales, technical, operations, and engineering inputs.
- Conducted business audits on polymer products; investigated margin improvement through product mix upgrades, downstream opportunities, and new technology.
- Maintained technical database on plastic resins, applications, and competition; coordinated short- and long-range polymer business plans.

Project Manager, Planning and Development. Under this role, Mr. Fearncombe completed the following:

- Directed new business projects; presented final proposals to senior management, devised market strategies, wrote business models and developed raw material sources.
- Guided consultant analyses on NPC's technologies, cost position, business strategies, and industry outlook.
- Established technology assessment program, including inter-polymer competition, process alternatives, and raw material options.

Senior Business Development Specialist. Under this role, Mr. Fearncombe completed the following:

- Identified and evaluated acquisition candidates based on market analysis, technology, pro formas, facility inspections, and third-party contacts.
- Directed project team, which conceived and proposed an aggressive expansion program in NPC's base business.

Senior Area Engineer, Ethylene/Polypropylene Plants . Under this role, Mr. Fearncombe completed the following

- Implemented computer-assisted material balance control on ethylene plant.
- Supervised afternoon shift during gas-phase polypropylene plant startup.

BASF Wyandotte Corporation

Wyandotte, Michigan

Economic/Cost Evaluation Mgr, Organic Chemicals Div. Under this role, Mr. Fearncombe completed the following

- Completed impact studies on price changes, sales, and tolling proposals.
- Developed budgets, monthly profit forecasts, and variance explanations.

Steve Branson

Steve Branson is an expert in scrap tire recycling equipment systems, shredded and crumb rubber equipment manufacture and repair, and crumb rubber system design and operation. Mr. Branson currently works with Innovative Distribution and Manufacturing, and is assisting scrap tire firms with shredding and crumb rubber equipment design and installation. He has worked as a manager and designer/installer for equipment manufacturers Pacific Shredder Technologies, Wendt Corporation and Eidal Shredders, and he has consulted with several North American crumb rubber production companies, including Fennel Recycling in New York and Buckeye Tire in Michigan.

IDM LLC

Mr. Branson started completing custom shredder projects for several end users. He also entered into a contract for the operation of a crumb rubber manufacturing company, responsible for all mechanical aspects and staffing. He completed the installation of a crumb rubber system and trained all necessary production and management staff to operate the facility. He was also responsible for the day-to-day operations and management of the facility.

Mr. Branson also worked in a partnership to build shredding and processing equipment primarily for internal use in the production of fuel and crumb products. The equipment will eventually be available on the open market. However, currently the goal is to produce equipment for use by the partner company.

Newell Corporation (Pacific Shredder Tech.)

IDM LLC /Pacific Shredder technologies and Newell Corporation formed a partnership to manufacture and sell Pacific Shredder Technologies shredding equipment. Mr. Branson's duties were primarily centered on all aspects of manufacturing, and selling shredder systems. He also completed technical work relating to special manufacturing projects as needed.

Pacific Shredder Technologies (Gender Machine Works)

Portland, Oregon

Mr. Branson was asked to be a managing partner in a new shredder manufacturing company, responsible for all design and drafting related to two shaft shredders, material transports, replacement parts, and ancillary equipment. Mr. Branson was also responsible for managing staff, manufacturing process, sales staff, and office staff as it related to the shredder business. He became the sole owner of the company and began to utilize sub contract manufacturing instead of "in house" assets.

Wendt Corporation

Tonawanda, New York

Mr. Branson was hired to perform sales for Wendt's import division. His responsibilities centered around equipment from Eldan-SR. The Eldan

Phoenix Institute of Technologies

Electro-Mechanical Drafting and Design

Licensing

Not Applicable

Tasks to Be Performed

- Industry Specialist
- Business Assistance

Innovative Distribution & Manufacturing, LLC

product line consisted of over a dozen machines designed for the processing of tires, cable scrap, scrap aluminum, and electronics. Another aspect of the job was working with the existing customers as a process consultant.

Tire Chipping System

En-Tech Inc.

En-Tech originally contracted with Mr. Branson to custom build a large tire shredder. The client had many ideas they wished to discuss and implement into the shredder. Since that time, En-Tech has frequently contracted for other projects ranging from consulting and customizing tire equipment to general design, drafting, and mechanical oversight.

Crumb Rubber Plant

Buckeye Tire

The system was purchased but not mechanically operational. Mr. Branson was contracted to complete the installation, train all employees, set up general practices, and manage the facility. The system consisted of several brands and types of tire recycling equipment. Some of the equipment was usable and some was not. When Mr. Branson left, the system was capable of producing mid-range sizes of crumb rubber. The project was terminated before completion.

Fennell Recycling

This company was a client of Wendt Corporation. Mr. Branson provided consultation to help facilitate a start in crumb rubber production. Additionally, he has evaluated used tire shredders as an addition to their company.

Eidal Shredders

West Linn, Oregon

Mr. Branson was originally hired to transfer hand drawings into Auto-CAD. The drawing proved to be unusable, so he worked with the existing subcontractors to design and implement a drawing system involving all aspects of manufacturing two shaft shredders. Additionally, Mr. Branson developed working relationships with all categories of subcontract suppliers such as raw steel, machining, fabrication, heat treat, electrical controls, and installation. He also gained responsibility for overseeing the process of design, drafting, manufacturing, assembly, and installation of equipment and systems based on two shaft shredders.

Terry Leveille

Terry Leveille, president of TL & Associates and editor of the California Tire Report, is a former Chief of Staff to a member of the California State Assembly, Press Secretary and Legislative Aide to a member of the California State Senate, and Advisor to the Vice-Chair of the California Integrated Waste Management Board.

His articles on the state's tire recycling issues have appeared in Resource Recycling and the Scrap Tire News and he has spoken at international, national and state tire recycling conferences. He is a registered lobbyist and has worked on various projects with waste tire processors, recyclers and other end-users, tire product manufacturers, tire dealers, retreaders, and landfill operators.

TL & Associates

Fair Oaks, California

President and Publisher, *California Tire Report.* Mr. Leveille's responsibilities include:

- Acting as Editor/Publisher of trade news affecting tire recyclers and the waste tire industry.
- Business development consultant for tire recycling enterprises.
- Registered lobbyist before California State Legislature and California Integrated Waste Management Board.
- Grant writer for public and private sector clients.

California State Assembly

Sacramento, California

Chief of Staff to Assemblywoman Elaine Alquist. Mr. Leveille's responsibilities under the California State Assembly included:

- Acting as Chief of Staff and Legislative Director for Capitol and District offices, employing 12 professional staff members.
- Advising Assemblywoman Alquist on key political and legislative issues, including those affecting natural resources, the state budget, transportation, education, and local government.
- Acting as a Liaison between Assemblywoman Alquist and Assembly leadership, State Senate, and the Governor.
- Acting as Chief Communications Director for Assemblywoman Alquist and staff.

California Integrated Waste Management Board

Sacramento, California

Deputy Advisor to Vice Chair Wesley Chesbro. Mr. Leveille's responsibilities for the California Integrated Waste Management Board included:

Post graduate studies, History
San Jose State University

Community College Instructor Program
San Francisco State University

San Francisco State University
M.A. in Political Science

University of California, Santa Barbara
B.A. in Political Science

Licensing
Not Applicable

Tasks to Be Performed

- Industry and Sector Wide Assistance (Advisor on California Tire Industry and Board Programs)

TL & Associates

- Advising Vice Chair Chesbro on permitting and new technology issues and waste management legislation affecting the Board.
- Writing op-ed articles, speeches, and press releases.
- Acting as a Liaison between Vice Chair Chesbro and the State Senate.

California State Senate

Sacramento, California

Communications Director and Legislative Assistant for State Senator Dan McCorquodale.
Mr. Leveille's responsibilities as communications Director and Legislative Assistant included:

- Coordinating all media activities for Senator McCorquodale and 21-member staff, editing a quarterly newsletter, and drafting press releases, speeches, newspapers, and magazine articles.
- Advising Senator McCorquodale on local government, transportation, and housing.
- Directing a bill package to each legislative session. This process included drafting all statements and speeches, and testifying before legislative committees and interest groups.

3) Please Fill out the Information Requested in the Following Tables

Table 1 Firm Type

Which firm type(s) best describe your business?	Percent by Firm Type & Fiscal Period					
What is each type contribution & asset usage?	% Revenue Contribution			% of Total Assets Used		
Check all Firm Types that Apply	**2003**	**2004**	**2005**	**2003**	**2004**	**2005**
❑ **Collections**						
❑ **Manufacturer / End User**						
❑ **Processor**						
❑ **Other (Identify)**						
TOTAL Contribution = 100%	**100**	**100**	**100**	**100**	**100**	**100**
❑ **What Portion of Revenue & Assets Used are Directly the Result of Recycling CA tires?**						

Provide information or other materials that would be helpful in assessing current business situation and future needs.

_____

_____

_____

Table 2 Employment (list as full time equivalents, FTE)

Treat 1 FTE as equal to one person working full time for a full year considering whether temporary, part time or full time employment. Also include average wage / salary for each category	**FY 2003 FTE**	**FY 2003 Ave $**	**FY 2004 FTE**	**FY 2004 Ave $**	**FY 2005 FTE**	**FY 2005 Ave $**
Direct Labor:						
Indirect Labor / Support to Direct Labor:						
Management:						
Administrative:						
Total FTE						

Table 3 Material Input and Output

Identify & Provide breakout of material by category and approximate weight processed or handled that ultimately results in generating revenue. Include prior 3 year actual & 3 yr plan.	Material Processed and Sold as Product Weight per Year (specify wt units or PTE)					
Material Category	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Whole Tires						
Shred or Chips (Typical Size:)						
Ground Rubber (Typical Size:)						
Manufactured Products (Please Itemize)						
TOTAL WEIGHT per Year						

Sample of Written Work No. 1

Pennsylvania Recycling Markets Center Three-Year Business Plan

August 2003

Prepared for: Pennsylvania Department of Environmental Protection

Prepared by: R. W. Beck, Inc.

Included as Exhibit I to R. W. Beck's Proposal for:

California Integrated Waste Management Board Tire-Derived Product Business Assistance Program

Contract No. IWM05030

R·W·BECK

Pennsylvania Recycling Markets Center

Three-Year Business Plan

August 2003

R·W·BECK

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Pennsylvania Recycling Markets Center
BUSINESS PLAN

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EXECUTIVE SUMMARY

This three-year business plan describes the establishment of a Recycling Markets Center (RMC) to be the lead organization for recycling market development in Pennsylvania. The mission of RMC is to expand and develop more secure and robust markets for recovered secondary materials by helping to overcome market barriers and inefficiencies. In fulfillment of this mission, the Center will:

- Promote the capacity of public and private organizations in the state to be effective actors in markets for recyclable materials and recycled products, and
- Undertake efforts that remove barriers to market development.

While the primary focus of these efforts is to increase the use of such materials by existing, start-up, and recruited Pennsylvania businesses, the RMC will also pursue opportunities for export of Pennsylvania-generated secondary materials that cannot be cost-effectively consumed in state.

The RMC will undertake activities in the following three programmatic areas:

- ***Organizational capacity building*** – to enhance the knowledge and skills of Pennsylvania professionals who can play a role in enhancing the marketability of and markets for recyclable materials – whether they represent generators, haulers, processors, end users, or recycling market development service providers – to aid them in becoming more effective participants in the marketplace.
- ***Recyclable materials markets building*** – to stimulate firms and entrepreneurs to utilize secondary materials and expand recycled products manufacturing on their own initiative, through both "wholesale" and "retail" efforts aimed at addressing market inefficiencies pertaining to specific materials as well as the use of recyclable materials as feedstocks in general.
- ***Center program planning and evaluation*** – to ensure that the programs, services, and activities that the RMC sponsors remain appropriate and effective with respect to addressing priority recycling market development needs and opportunities.

Potential RMC clients and the types of services and programs they are anticipated to receive are listed in the table below. The RMC will work to evaluate opportunities for serving clients that hold the most promise for successfully undertaking efforts that will contribute towards achieving established recycling market development goals and priorities.

Table E-1
Potential RMC Clients and Services They May Receive

Potential Center Clients	Info. & Outreach / Education	Relationship Building / Facilitation	Technical / Tech Transfer Assistance	Business Financing	Research & Development	Marketing Research / Procurement	Regulatory/ Policy R & D
Existing recycled product manufacturers in PA	X	X	X		X	X	
Potential recycled product manufacturers (e.g., feedstock conversion candidates, start up companies, and companies interested in locating in PA)	X	X	X	X	X	X	
Recyclable materials generators, collectors and other supply chain players, both public and private (when market access to supply is impeded)	X	X	X				X
Procurement officials (public and private)	X	X					X
Recycling professionals, business and technical assistance service providers, and community and economic development professionals	X	X					

The RMC will work to remain in communication with all recycling market development stakeholders, and will seek opportunities for coordination and collaboration of work efforts as appropriate and mutually beneficial.

It is proposed that the Recycling Markets Center be established as a nonprofit subsidiary of an existing Pennsylvania organization that has a compatible mission and resources of benefit to the RMC. A competitive process will be utilized to select an appropriate parent organization. Prospective parent organizations will be granted the opportunity to propose an alternative structure if it is believed that this would better serve the mission of the RMC. Additionally, prospective parent organizations will be allowed to propose the involvement of partners or subcontractors, to provide an organizational team capable of performing all of the functions of the RMC.

It is envisioned that the RMC will be governed by its own board of directors, consisting of nine voting members and four or more ex-officio members. The parent organization will be responsible for appointing the board members; however the RMC Board will not "report" to the officers or board of the parent organization. The Board will select its own officers, and these officers will be responsible for executing the policies of the Board.

Management and staffing details for the RMC will be decided by the RMC's Executive Director and Board. In its initial years of operation, it is envisioned that the RMC will have a staff of six to seven people:

- One executive director,
- One administrative assistant,
- Two program managers, and
- Two or three project/program support personnel.

Service delivery to individual clients will be carried out by RMC service provider "partners" and RMC staff, depending on the needs of each specific client. A significant portion of the work of the Recycling Markets Center will be to link client companies with service providers that can assist them in solving particular problems in such areas as business planning, finance, technical problem solving, product development and commercialization, market assessments, and materials sourcing. Service providers to be considered RMC partners will include:

- Public and private business assistance organizations;
- Public and private technical assistance service;
- Researchers and testing laboratories;
- Finance organizations; and
- Community-based organizations.

The RMC will pay partners as needed and mutually agreed upon for their time and services. However RMC partners will be expected to utilize their own resources for any work that would normally be undertaken as a part of their normal business.

The parent organization and RMC Board of Directors will determine the office location (s) of the Recycling Markets Center. It is anticipated that initially the Center will be housed in one office in Harrisburg.

The primary source of funding for the first five years associated with establishing and operating the RMC will be the Pennsylvania Recycling Fund. These funds are managed and allocated by the PA DEP. This guaranteed short-term funding will give the RMC time to focus on building its programs and results, and building a base of clients and constituents. The funds will go to support office overhead, staff, and programs. During this time, the RMC will identify additional sources of funds and develop a long-range funding plan.

The parent organization will be responsible for developing the RMC's initial start up and operating budgets, with the assistance of the RMC development steering committee (to be established by the parent organization), and subject to DEP approval.

Section 1
PROGRAM FOCUS

1.1 Need for Recycling Market Development

In response to Act 101, the Commonwealth has established an extensive set of programs that promote and support the development and expansion of recycling at the local level. These primarily "supply-side" efforts by the Commonwealth have been crucial in achieving the current statewide waste reduction and recycling levels. In order for the Commonwealth to maintain or surpass current recycling levels, however, the base of businesses that use secondary materials must be sustained and, for some materials, expanded to ensure that there are sufficient buyers:

- Paying secondary material prices that provide sufficient financial incentive for collection,
- That are reliable from one year to the next, and
- That expand the scope of markets that are currently limited in size.

To address this need, a strategically sound statewide recycling market development campaign is called for.

Given the nature of the U.S. and global economy, the marketplace is the primary, preferred mechanism for allocating resources (e.g., secondary materials, recycled products, labor, capital, and equipment). Hence the role of a recycling market development effort in the Commonwealth is not to replace markets, but to make markets work better. Primary objectives of recycling market development are to increase the private sector's ability to realize market development opportunities directly, and to identify and address inefficiencies in the marketplace that the private sector may not address on its own. Types of inefficiencies that are common to secondary materials markets and that can be addressed through recycling market development are:

- Imperfect flow of information,
- Uncertainty about future market conditions,
- Risk aversion,
- Mispricing of materials and products due to undervaluing public benefits and/or costs,
- Inability to reach economies of scale,
- High transaction costs,
- Unrestricted nature of technical information.

A description of these market inefficiencies is provided in Appendix A.

A number of private and public organizations in Pennsylvania address aspects of the needs identified above. For example, existing organizations provide services in the areas of technology development and commercialization, business development and assistance, economic development, job training, materials research, product and materials testing, business financing, and market research and marketing. However no organization in Pennsylvania has recycling market development as a primary mission or priority, builds consensus around the nature of the problems to be addressed, coordinates the diffuse existing programs, and establishes new programs as needed to address recyclable materials market needs and inefficiencies.

This document is a three-year business plan to establish a Recycling Markets Center (RMC) to serve as the lead organization for recycling market development in Pennsylvania. The RMC, as proposed herein, will be created and supported by public funds, and therefore will approach recycling market development from the perspective of the public sector. As such, it will operate under specific principles of approach, as outlined in the Commonwealth of Pennsylvania Recycling Market Development Strategic Plan, aimed at identifying and addressing inefficiencies in the marketplace.

1.2 RMC Mission and Approach

The mission of RMC is to expand and develop more secure and robust markets for recovered secondary materials by helping to overcome market barriers and inefficiencies. In fulfillment of this mission, the Center will:

- Promote the capacity of public and private organizations in the state to be effective actors in markets for recyclable materials and recycled products, and
- Undertake efforts that remove barriers to market development.

While the primary focus of these efforts is to increase the use of such materials by existing, start-up, and recruited Pennsylvania businesses, the RMC will also pursue opportunities for export of Pennsylvania-generated secondary materials that cannot be cost-effectively consumed in state.

Partnership approach – The RMC will recognize, support and value the contributions to be made by other organizations in addressing recycling market development needs and opportunities in Pennsylvania. Rather than duplicate services offered by existing organizations, the RMC will bring together these entities to create a network of recycling market development service provider "partners". (See Section 2.4 for a description of partner organizations.) It will cross pollinate the skills and expertise of various partners, and identify where there are gaps. The RMC will provide training and resources needed to build the capacity of all partners, including the RMC, to be effective in enhancing the markets for secondary materials. In addition, the RMC will broker assistance from these partners to manufacturers and other players in secondary materials markets.

Proactive as well as reactive – The RMC will facilitate as well as direct market development work in Pennsylvania. As such, the RMC will be the "face" of recycling

market development – the first stop for recycling market players to get information and assistance – and will be the engine that coordinates and drives recycling market development efforts. At the same time, it will respond to the needs of individual market players as they are brought forward.

Utilization of both materials-specific and cross material strategies – The RMC will develop and implement programs to stimulate and support markets for specific materials, as well as support overall market development goals, in a manner that is sensitive to the impact of its activities on existing businesses and industries in Pennsylvania. The Center will use such tools as information, technical assistance, facilitation, financial incentives, procurement, and policies to stimulate markets. Its work will focus on strategies that encourage feedstock conversion, technology development and commercialization, support of existing recycled product manufacturing businesses, new recycled product manufacturing business development, the increase of the purchase of products with recycled content, best practices in collection and processing, identification of new opportunities to develop recycled products, and education and outreach about its programs and services and the importance of the recycling industry to the Commonwealth..

Intelligent management – In addition, the RMC will ensure that effective management and sufficient organizational capacity exist to implement recycling market development work. It will do this through ongoing communication, consensus building, and coordination among the market development players; tracking supply, recovery, and demand trends for key secondary materials; developing and updating focused programs and services to meet specific and changing needs; budgeting and fundraising for priorities, assigning roles and responsibilities; coordinating partners, contractors, and staff; and building and maintaining institutional capacity for intelligent action.

By undertaking these efforts, the RMC will be prepared and positioned to identify and react in a timely fashion to important recycling market development opportunities and challenges as they arise. The RMC will work to enable its staff, as well as other recycling market development service providers, to be as expedient, creative, and entrepreneurial as the recycling businesses they work to support.

1.3 Center Programs

The RMC will undertake activities in the following three programmatic areas, discussed in more detail below:

- Organizational capacity building,
- Recyclable materials markets building, and
- Center program planning and evaluation.

1.3.1 Organizational Capacity Building

The Recycling Markets Center will enhance the knowledge and skills of Pennsylvania professionals who can play a role in enhancing the marketability of and markets for

recyclable materials – whether they represent generators, haulers, processors, end users, or recycling market development service providers – to aid them in becoming more effective participants in the marketplace. This will be accomplished through:

Information and outreach – The RMC will continually learn about resources available that can be of assistance in reaching the goals of recycling market development (such as various resource directories; best practices guidelines; market studies; technical reports, etc.) and get them in the hands of the recycling market players who need them. In addition, the RMC will create, as needed, new resources, such as service provider directories, sample market agreement documents, and materials sourcing guides.

Education and training – The RMC, working with its service provider partners, will develop training and education programs aimed at addressing knowledge gaps for specific target audiences as determined through needs assessment surveys, focus groups, interviews, etc. A sample list of topics that may be covered through such training events is as follows:

- How to improve seller/buyer relationships (for suppliers and end users);
- How to work with recycling market development clients (for recycling market development service providers);
- Expectations of business, economic, and financial service providers and how to meet them (for business clients seeking development and financing assistance);
- How to take advantage of and be more effective in the export marketplace (for suppliers, brokers and product manufacturers); and
- Best practices in overcoming quality problems (for processors and end users);

Relationship building – The RMC will work to enhance relationships and mutual understanding among key recycling market players through sponsorship of meetings, tours and field visits, creation of networks, listserv discussion groups, and similar activities.

1.3.2 Markets Building

The RMC will put the programmatic tools in place to stimulate firms and entrepreneurs to utilize secondary materials and expand recycled products manufacturing on their own initiative, through both "wholesale" and "retail" efforts aimed at addressing the market inefficiencies listed above.

Wholesale efforts provide large numbers of market players with access to a wide variety of resources (informational, financial, technical, personnel, and otherwise). Such resources are generally in the form of standardized products (e.g., a grant program or access to resource guides) that are not customized for individual clients. The RMC will serve as a wholesaler by facilitating client access to services provided by organizations such as business development agencies, universities, and consulting firms, and by providing services where there are gaps in those provided by other agencies. In addition the RMC will develop and/or distribute informational and technical assistance tools and products, both directly and via web page links.

Retail efforts involve one-on-one service to individual clients. The RMC will act as a broker of retail services by screening clients and referring them to the most appropriate service provider for assistance and/or working with them directly (for example, by helping them find a source of feedstocks) when the specific knowledge and expertise of RMC staff is called for.

A combination of wholesale and retail services is important. Wholesale services are more efficient than retail in reaching a wide audience. Retail services are more effective than wholesale in providing the type of service needed by a particular client.

The RMC will also develop and employ strategies that target specific secondary materials, as well as those that work across materials.

Material-Specific Strategies

The Commonwealth's strategic plan identifies several materials that have recycling potential but are still prevalent in the solid waste stream for which there may be opportunities to impact their marketability. In its first three years, the RMC will explore means of realizing market development opportunities for one or more of the following materials (depending on resources and available opportunities): surplus food, film plastics, mixed paper, textiles, other rigid plastics (non- #1 and #2 coded), leaf and other yard waste, unpainted wood, and mixed color glass cullet. Potential market development options for these materials are listed in the following table.

Table 1-1
Market Development Options for Target Secondary Materials

Material	Potential Market Development Opportunity
Surplus Food/ Food Waste	▪ Facilitate supply to food banks (more of a supply and processing issue than demand). ▪ Use to manufacture animal and fish feed (processing infrastructure also needed to cook food). ▪ Create demand for alternative uses of compost such as mine reclamation, erosion control, wetland rehabilitation, biofiltration, and highway construction.
Film Plastics	▪ Substitute in making plastic lumber and other existing in-state applications. ▪ Investigate feasibility of establishing a plastic lumber plant in Pennsylvania. ▪ Increase research into new uses for film plastics. ▪ Turn into new film products, such as agricultural plastic.
Textiles	▪ Turn into rags, shoddy (padding and/or stuffing), oil containment, flock.
Other Rigid Plastics	▪ Sort and use as feedstocks in making new products.
Mixed Paper	▪ Substitute for higher-grade paper in certain paper applications. ▪ Use in making molded paper products – particularly small scale using the new technologies.
Leaf and other Yard Waste	▪ Enhance the capacity and throughput of existing composting facilities/sites. ▪ Create new markets for compost such as mine reclamation, erosion control, wetland rehabilitation, biofiltration, and highway construction.
Untreated/ Unpainted Wood	▪ Process wood for the particleboard and medium density fiberboard (MDF) industries. ▪ Promote use of finger joining technologies to increase value of scrap wood. (A method of joining two pieces of lumber – often random lengths – end-to-end by sawing into the end of each piece a set of projecting "fingers" that interlock. When the pieces are pushed together, these form a strong glue joint.) ▪ Develop markets for small wood pieces, including pre-cutting pieces for furniture, instruments, etc. ▪ Process wood for wood/polymer composite product market.
Mixed Color Glass Cullet	▪ Use in glassphalt paving, as construction aggregate, alternative daily landfill cover, flowable fill, filtration and drainage uses, filler (stucco, reflective paint, non-skid surface treatments), brick and tile products. ▪ Depending on PA's industrial bases, develop high value applications, such as use as a fluxing agent, substitution for feldspar, and pre-drinking water filtration.

Other materials (such as used automobile tires) may be considered within the three-year period or for planning purposes in future years. Criteria that will be considered to determine which materials should be addressed include:

- The material is prevalent in the waste stream, and/or problematic to dispose;
- A sufficient supply of the recyclable material could be obtained with the quality required;

- Pennsylvania-based firms that would produce the recycled product have some competitive advantage in selling that product;
- Opportunities to utilize this material and potential demand for the manufactured recycled product are sufficient, to allow the product manufacturer to make a profit;
- Major challenges (e.g., technical, economic) to the implementation of the opportunity can be identified, have not been addressed by the market working alone, and have the potential to be overcome through state intervention;
- Realization of the market opportunity has the potential to result in tangible additional diversion of MSW; and
- Realization of the market opportunity has potential economic benefits, for example, job creation/retention, increased competitiveness, and increased entrepreneurship;
- There is an interested group (or groups) who want to pursue a business opportunity in using the material.

Not all criteria will need to be met for a material's consideration by the RMC.

The RMC will identify barriers that keep secondary materials market opportunities from being realized, and bring together the appropriate stakeholders – commercial and residential collectors and processors, brokers, manufacturers who may be able to substitute a recyclable material, researchers, financial service organizations, trade associations, providers of technical support, purchasers, etc. – to help overcome these barriers. Tools that will be used as needed to overcome identified barriers include:

Information – Providing market actors with information, such as market data, recycling business directories, information regarding product availability and performance, technical information, training, referrals, etc.;

Technical assistance – To players in the supply and demand chain to increase efficiencies, reduce costs, and enhance product opportunities and properties;

Facilitation – Bringing market players together through stakeholder forums, waste exchanges, linking purchasers with manufacturers, identifying appropriate financing, referrals to legal, technical, and business assistance, etc.;

Financial – Providing incentives, such as loans and grants[1], to encourage or discourage certain behaviors;

Procurement – Promoting greater use of the Commonwealth's purchasing power and procurement system to increase the purchase of recycled products, using, if needed, tools such as prices preferences, set-asides, modifying of bid specs etc.; and

[1] Note: The RMC cannot pass through grant money from Commonwealth sources; however the RMC can recommend allocation of grant funding by state agencies to specific recipients. In addition, the RMC can issue grants from other sources, such as private foundations.

Regulation – Recommending policies such as tax incentives, landfill bans, minimum content requirements, or preferential procurement requirements that will influence desired behaviors.

Efforts in identifying and realizing a small number of material-specific strategies will supplement, versus dominate, RMC efforts to encourage markets at large to consume more Pennsylvania-generated secondary materials. In addition, RMC staff will monitor industry-based recycling market development efforts, such as the Carpet America Recovery Effort, and assess opportunities for participation in such efforts, as well as their potential impact on Pennsylvania markets.

General Market Development Strategies

The RMC will encourage and support numerous and diversified market development opportunities. It will also build the capacity of manufacturers to use (more) secondary materials by employing general (cross-material) strategies that seek to put in place tools and resources that can identify and respond to market development opportunities across a wide range of materials as the need arises. The RMC will utilize the resources and services of a range of agencies and organizations in the Commonwealth and region to implement the following strategies:

Feedstock conversion – Through education, technical assistance, and/or financial assistance, help existing Pennsylvania manufacturers to convert from virgin to secondary materials to the extent that technology and markets allow.

Technology development and commercialization – Through sponsored research, encourage the successful development and commercialization of innovative recycled products and manufacturing technologies for recycled products in Pennsylvania.

Support of existing recycled product manufacturing businesses – By keeping track of, building relationships with, and supporting the range of business service providers in the Commonwealth, provide existing Pennsylvania recycled product manufacturers with access to the financial, professional, educational, and infrastructure resources necessary for expansion of sales, profits, and jobs.

New recycled product manufacturing business development – By providing financing assistance, education and training, encourage and support the startup and recruitment of new final and intermediate recycled product manufacturing businesses in Pennsylvania, including non-profit and for-profit enterprises.

Buy recycled – Through sponsoring of demonstration projects, independent product testing, life cycle analysis, recycled product showcases, and other efforts, promote the purchase of recycled products by government, businesses, institutions and other consumers, particularly those manufactured in Pennsylvania.

Collection and processing best practices and technology development – By sponsoring research and keeping up with trends in the field, promote and support the development and adoption of collection and processing technologies and best practices that reduce the cost and improve the quality and availability of secondary materials needed by recycled product manufacturers.

Identification of new recycled product opportunities – By keeping track of public and private purchasing trends and needs, search for and identify opportunities for new products that can be made from recyclable materials, assess demand, and seek out Pennsylvania manufacturers to make them.

Education and outreach – Through activities such as public speaking, publishing articles, developing case studies, advertising in trade publications, and exhibiting at trade events, effectively convey information on market development and available services to target audiences.

1.3.3 Program Planning and Evaluation

Critical to the success of the RMC's program of work is effective planning, along with regular monitoring of implementation efforts in terms of their appropriateness and effectiveness, and adjusting strategies and tools accordingly.

Through appropriateness evaluation, the RMC will assess whether specific programs are aiming at the right targets. Through effectiveness evaluation, the RMC will ask how well each program is hitting its targets. These evaluations are critical for program improvement as well as program justification. To the extent possible, program data and information that would facilitate evaluation will be collected as part of ongoing operations, and a requirement of any contract signed between the RMC and its clients or service providers.

The Center will ensure that the programs, services, and activities that it sponsors remain appropriate and effective with respect to addressing priority recycling market development needs and opportunities. This will be accomplished through:

Current, accurate market intelligence and assessment – The RMC will perform up-to-date market intelligence, consisting of tracking supply, recovery and demand trends (particularly for problematic secondary materials), and assessment in order to proactively make appropriate adjustments in ongoing activities, as necessary. To do this, the Recycling Markets Center will communicate with stakeholders such as DEP and MRF operators regarding opportunities in the supply chain, and with brokers and end-users regarding barriers on the demand side. The RMC may periodically hold meetings among key players in the supply and demand chain for particular commodities, and include other stakeholders (such as materials researchers and trade associations) as appropriate to have a comprehensive discussion on problems and opportunities. The RMC will also augment the Commonwealth's current recyclable materials supply and MRF-related information gathering and maintenance activities by gathering and maintaining information on other processors (e.g., recovered paper dealers and plastics reclaimers) and end users – both local and regional; market forces and trends; market barriers; and market development needs and opportunities presenting themselves in Pennsylvania. In addition, the RMC will stay abreast of new technologies for collection, processing, and manufacturing with recyclable materials.

Establishment of recycling market development goals and priorities – The RMC will work to facilitate priority setting among the appropriate market players and build programs that are sensitive to their diverse interests and available resources, while

remaining true to the goals and priorities of the RMC. The various organizations that will be partnering in this market development effort will likely have different goals, priorities, and expectations. Business and economic development agencies, for example, seek creation of jobs and increasing the competitiveness of existing businesses; financial service organizations will be more interested in a return on investment than creating jobs; and agencies responsible for recycling seek diversion of waste from disposal facilities. In establishing recycling market development goals, the RMC will assess the relative importance of these various desired outcomes, giving consideration to both environmental and economic impacts, and how programs and services can be designed to address these different priorities. Goals and priorities will periodically be revised to reflect changing circumstances and needs.

Focused approach to strategy and program development – The RMC will lead an annual strategic planning process with input and involvement from recycling market development partners and stakeholders as appropriate. Through this process, long-range goals and actions will be revisited and annual work plans and budgets determined. Regular RMC board and stakeholder meetings throughout the year will provide further opportunity for strategic plan and work plan fine-tuning as well as discussion of current market development opportunities and the means by which the RMC and its service provider partners can collectively address them. Specific performance objectives will be developed for each program that reflect the limits of available personnel and budgetary resources.

Resource allocation – The RMC will work as a coordinating body to provide for the cost-effective allocation of financial and human resources available for recycling market development. Given the number of players in the recycling market development puzzle, the RMC will facilitate ongoing dialogue among these organizations for the purpose of defining and evaluating roles, responsibilities, and organization-specific programs of work in accordance with the Pennsylvania Recycling Market Development Strategic Plan and the RMC's own work plan. In addition, the RMC will work to identify and enlist the involvement of other organizations to partner in recycling market development work as the years go by.

Evaluation of RMC program and project performance – The RMC will develop program measures and performance monitoring procedures for each of its core programs and services to ensure that Center activities are both appropriate and effective in meeting identified goals and objectives. The results of evaluation efforts will be utilized in annual work plan development and strategic planning as well as in publicizing the Center's accomplishments and recruiting clients. Recognizing that outcomes for certain types of recycling market development work can take several years to be achieved, evaluation of the RMC's performance will be benchmarked against similar economic development, technology development and commercialization, and recycling activities in Pennsylvania and elsewhere.

1.4 Center Clients

Potential clients of the Recycling Markets Center and the types of services and programs they are anticipated to receive are listed in the table below. Due to limited

resources, the RMC cannot serve all prospective clients. Center staff, in cooperation with its partners, will work to evaluate opportunities for serving clients that hold the most promise for success and contributing towards achieving established goals and priorities.

Table 1-2
Potential RMC Clients and Services They May Receive

Potential Center Clients	Info. & Outreach / Education	Relationship Building / Facilitation	Technical / Tech Transfer Assistance	Business Financing	Research & Development	Marketing Research / Procurement	Regulatory/ Policy R & D
Existing recycled product manufacturers in PA	X	X	X		X	X	
Potential recycled product manufacturers (e.g., feedstock conversion candidates, start up companies, and companies interested in locating in PA)	X	X	X	X	X	X	
Recyclable materials generators, collectors and other supply chain players, both public and private (when market access to supply is impeded)	X	X	X				X
Procurement officials (public and private)	X	X					X
Recycling professionals, business and technical assistance service providers, and community and economic development professionals	X	X					

There are many other stakeholders in recycling market development besides its clients and network of service provider partners that the RMC needs to communicate with and involve, as appropriate, in its work. Key stakeholders in the work of the RMC and their potential roles are:

- ***PA legislature*** – which authorizes funding for the RMC, and may act on policy developed by the RMC;
- ***Recycling industry and trade associations*** – whose members may be affected by PA recycling market development efforts and who may partner with the RMC in certain endeavors such as outreach and education;
- ***Recycling professional organizations*** – whose members may be recipients of RMC services and who may partner with the RMC in certain endeavors such as education and training events;

- ***Industrial ecology, pollution prevention, and other entities working in related or overlapping arenas*** – which may benefit from collaborating with the RMC in certain mutually beneficial efforts;
- ***Materials researchers*** – who may assist in researching needs and opportunities to overcome technical barriers and create new products;
- ***Neighboring states*** – which can benefit from new or expanded PA markets and/or partner with PA in regional market development efforts; and
- ***U.S. EPA*** – which supports state recycling market development efforts through its Jobs through Recycling program and regional offices.
- ***Potential funders*** – who will want to ensure that their support effectively and efficiently accomplishes mutually held objectives.

The RMC will work to remain in communication with these and other stakeholders, and will seek opportunities for coordination and collaboration of work efforts as appropriate and mutually beneficial.

1.5 Marketing and Outreach

To enhance its success and sustainability over the long term, the Recycling Markets Center will market its programs and services, as well as the benefits of recycling market development. In addition, the RMC will demonstrate and convey how its actions are effective in addressing recycling market development needs and opportunities. The RMC will use a wide range of methods to accomplish these objectives. Key methods are as follows:

- Build an effective communications network with and among all recycling market development stakeholders.
- Establish reciprocally beneficial working relationships with partner organizations.
- Enlist the assistance of RMC partners in performing outreach to prospective clients.
- Publicize the RMC activities and work outcomes to improve organizational credibility and increase client referrals to the Center by other organizations.
- Build a strong web site that functions both to promote the RMC itself and to supply targeted information of value to clients, partners, and other stakeholders as appropriate.
- Work to get other organizations' web sites to provide links to the RMC web site.
- Develop and distribute an electronic newsletter.
- Convene periodic stakeholder forums to provide for two-way communication and relationship building with the RMC and among forum participants.
- Issue periodic press releases and work to get information about the RMC and its activities included in the publications of other organizations serving the same client base.

- Involve RMC staff in spending substantial time out in the field, getting to know target clients and their needs, concerns, and interests.
- Develop an understanding of the interests of existing and prospective financial sponsors, including the PA legislature, and communicate regularly with sponsors to provide assurance that their interests are being met by the Center.
- Attend and present at meetings held by other organizations that have attendees who are existing or prospective clients of the Center.
- Develop exhibit materials for use in trade shows.
- Establish a recycled product manufacturer's network, if this is determined to be of interest and value to its potential members.
- Develop printed materials targeting specific audiences that convey how RMC services and programs will benefit them directly or indirectly by addressing their needs and concerns.
- Publicize success stories and provide other means of recognizing RMC achievements as well as the achievements of its clients.

As for all of its programs, RMC marketing and outreach activities will be evaluated to determine what is most effective, and the marketing and outreach strategy will be fine-tuned as needed.

1.6 Anticipated Outcomes

The primary aim of the Recycling Markets Center is to increase the use of Pennsylvania-generated secondary materials in product manufacturing. Toward this end, the RMC will design its programs and services to achieve the following outcomes:

- Improved markets for Pennsylvania-generated secondary materials;
- Increased recycling in Pennsylvania;
- Increased recycling industry-related employment and the economy of Pennsylvania overall; and
- Enhanced recycling market development capacity of organizations in the state.

More specifics with respect to these outcomes are briefly discussed below.

1.6.1 Improving Markets for Secondary Materials

Recycling Markets Center actions are expected to positively impact the nature of demand, both in state and across state and national boundaries, by strengthening existing in-state markets, creating in-state markets for materials that do not have global or regional markets, and increasing the export of secondary materials to buyers outside the Commonwealth.

Impacts of a more indirect nature that the RMC expects to have are as follows:

- Specific market development efforts that are successful in Pennsylvania may be emulated in other states – particularly ones close by – thereby multiplying the effects.
- Pennsylvania recycling businesses that receive assistance through the RMC and become more successful as a result will cause other firms and entrepreneurs in Pennsylvania and elsewhere to take note.
- Because Pennsylvania has several organizations that are strong in technology development and research capacity, the state has the potential to be the home of newly developed recycling technologies that could increase the technical feasibility and profitability of certain recycled product lines. As firms throughout the country and beyond employ these technologies, the demand for secondary materials has the potential to increase.
- Small increases in demand by in-state manufacturers can have a long-term positive impact as economies of scale are gained. Increased economies can lead to lower prices, which in turn can further stimulate demand.
- A greater presence of recycled products in the marketplace can itself lead to increased demand. Prevalence of such products in the marketplace can help overcome bias against the use of recycled products as a substitute for virgin material-based products among those who perceive recycled content products to be inferior in quality.

1.6.2 Increasing Recycling

Recycling market development activities undertaken by the RMC and its partners are anticipated to have a positive impact on materials recovery:

- When demand for secondary materials increases, suppliers will feel more secure about the marketability of the materials collected which may result in greater investment in recovery systems and recovery efforts.
- Suppliers that are informed about and attend to the needs of purchasers, in terms of material homogeneity and level of contamination, may reap higher prices and encourage a greater level of recovery.

1.6.3 Increasing Employment and the PA Economy

Beyond its impact on recycling in Pennsylvania, the Commonwealth has further reason to promote recycling market development through establishment of the RMC – jobs creation. More specifically:

- New and expanded Pennsylvania manufacturing businesses will create new jobs, which will improve local and state economies. According to the Recycling Economic Information Study prepared for the Northeast Recycling Council by R.W. Beck in June 2000 and the U.S. Study prepared for the National Recycling Coalition by R. W. Beck in July 2001, recycling businesses already employ over 81,000 people in Pennsylvania, with recycled product manufacturers alone generating annual sales of over $15.5 billion. For every new direct job created,

several more are created to support this position. Retention of recycling industry-related jobs is equally as important as creating new jobs

1.6.4 Enhancing Market Development Capacity

RMC services and programs aimed at building institutional capacity for recycling market development are expected to have a positive impact in a number of areas:

- Agencies and institutions performing business and economic development work that are trained, equipped, supported, and incentivized to address recycling market development opportunities will be more active and more effective in undertaking such work.
- Recyclable materials suppliers that are informed and educated about the needs of end users and how to do business in the recycling marketplace will have greater knowledge about how to access and participate in existing markets and will be better positioned to supply new markets as they are developed.
- Suppliers, processors and end users that are supplied with technical information on best practices and other information will be more capable of addressing barriers impeding the generation of cost-effective suitable quality supply, and use of recyclable materials in product manufacturing.

Section 2
MANAGEMENT AND OPERATION

2.1 Institutional Structure

The Recycling Markets Center is anticipated to be established as a nonprofit subsidiary of an existing Pennsylvania organization that has a compatible mission and resources of benefit to the RMC. Considerations made in reaching this conclusion are outlined in Appendix B. It should be noted that other institutional options are also feasible.

A competitive process will be utilized to select an appropriate parent organization. Given that PA DEP is providing the funding for establishing and operating the RMC (see Section 3 below), DEP will issue a Request for Proposals, and manage this selection process. Prospective parent organizations will be granted the opportunity to propose an alternative structure if it is believed that doing so would better serve the mission of the RMC. Additionally, prospective parent organizations will be allowed to propose the involvement of partners or subcontractors, to provide an organizational team capable of performing all of the functions of the RMC. Characteristics to be sought in the parent organization include the following:

- Organizational mission supporting the RMC undertaking a full range of recycling market development work;
- Experience and capability in establishing and overseeing other similarly structured entities;
- Commitment to enabling the RMC to establish its own organizational priorities and identity, and to undertake recycling market development activities without threat of resources being redirected to address other priorities of the parent organization;
- Commitment to establishing and maintaining the RMC as an entity with its own governance and management structure thereby permitting it to act autonomously, although remaining accountable to the parent organization for its performance and use of sound business/management practices;
- Ability to provide office space, administrative support, and other business/ institutional resources at low overhead rates, to minimize start up and ongoing operational costs for the RMC;
- Ability to provide programmatic resources and services of benefit to the RMC and/or its clients;
- Minimal conflict of interest, particularly pertaining to the RMC's allocation and use of funds;

- Ability to aid the RMC in attracting and serving the full range of clients that might benefit from recycling market development assistance;
- Ability to build ties with private companies and other partners;
- Ability to permit the RMC to receive funds from various sources (particularly DEP), and capability to help the RMC attract such funding;
- Ability to enable the RMC to allocate funds for contracts, grants and/or loans to public and/or private sector entities in a timely fashion;
- Ability to aid the RMC in attracting and retaining staff with needed skills;
- Ability to maintain client confidentiality;
- Ability to establish the RMC as a legal entity in a timely and appropriate fashion;
- Possession of the trust and respect of other organizations with interests in recycling market development in Pennsylvania.

The selected parent organization will be responsible for:

- Providing legal counsel and developing the legal entity for the RMC, to the extent that a separate legal entity is deemed appropriate; and
- Arranging for office space, office furnishings and equipment, etc to establish the physical office for the RMC.
- Accounting/record keeping/contract administration (depending on the institutional structure established).

Additional responsibilities of the parent organization are delineated on a topic-specific basis below.

2.2 Governance

It is envisioned that the RMC will be governed by its own board of directors. The Board will be responsible for managing the business and affairs of the RMC. The RMC, through the action of its board, will have the power to:

- Adopt bylaws;
- Contract and execute instruments necessary or convenient for carrying on of its business;
- Sue and be sued, complain and defend in court; and
- Accept funds from all available sources.

The Board will consist of nine voting members and four or more ex-officio members.

To expedite establishment of the RMC, it is envisioned that DEP will appoint a "RMC steering committee" to provide guidance in creating the RMC and to recommend candidates for the founding Board of Directors. Once the parent organization is selected, the parent will assume responsibility for staffing and overseeing the steering committee (later to be replaced by a Board of Directors selection committee and the

Board, itself, once established), appropriately involving the committee and the Board in decision-making regarding the RMC, and making all future committee and Board appointments.

In making Board candidate recommendations, the RMC steering committee (and future selection committee) will seek persons who, in combination, possess local, national and international perspective, and are knowledgeable about and have contacts with organizations in the following areas:

- Recycled product manufacturing;
- Recyclables processing;
- Waste/recyclables hauling;
- Municipal recycling program operation;
- Manufacturing technology development and commercialization;
- Commodity-specific secondary material markets (e.g., plastic, paper, glass, metals);
- Business development finance; and
- Community and economic development.

In addition, board candidates will be selected based on their knowledge and experience in governing/managing organizations – particularly nonprofits. The steering committee will make provisions for establishing permanent representation on the Board by the PA DEP and DCED, to provide for formal liaison with these agencies. The seven board members who are non-state-agency appointees will serve staggered three-year terms. Initially, two members will be appointed for a one-year term, two for a two-year term, and three for a three-year term. In accepting an appointment, each of these board members will be expected to understand that his or her duty will be to fulfill the mission of the RMC and not to represent any organization, industry, or interest group. At the conclusion of a term, board members may be re-appointed.

Ex-officio members of the Board of Directors are envisioned to include one representative each from the Recycling Fund Advisory Committee, the Northeast Recycling Council, and the Mid-Atlantic Consortium of Recycling and Economic Development Officials (MACREDO), and the Mid-America Council of Recycling (MACRO).

The RMC Board of Directors will select its own officers, and these officers will be responsible for executing the policies of the Board. While appointed by the parent organization, the RMC Board will not "report" to the officers or board of the parent organization.

2.3 Management and Staffing

Management and staffing plan details for the Recycling Markets Center will be decided by the RMC's Executive Director and Board. The parent organization will

retain the right to examine the management plan, annual work plans, financial reports, etc., and to otherwise hold the RMC and its management accountable for the performance expectations of the parent. Likewise, DEP will retain the right to examine such plans and reports as well as conduct periodic independent performance evaluations, to ensure that the RMC is making appropriate use of DEP-provided funding.

In its initial years of operation, it is envisioned that the RMC will have a staff of six to seven people:

- One executive director,
- One administrative assistant,
- Two program managers, and
- Two or three project/program support personnel.

The Executive Director will be in charge of day-to-day operation of the RMC, creating an overall vision and direction for the organization, fundraising, hiring and managing staff, and promoting the RMC and recycling market development. A draft job description for the Executive Director is provided in Appendix C. The Executive Director will be hired by and report to the Board of Directors. All other staff will be hired by and accountable to the Executive Director.

In addition to the Executive Director, an office manager will be hired to handle RMC administrative and business functions. Responsibilities of the Office Manager include:

- Managing accounts receivables and payables;
- Contracts administration;
- Record keeping;
- Managing resources, such as mailing lists, contacts, and office library;
- Secretarial and administrative support for the executive director and board;
- Procuring and maintaining office equipment, information technologies, and furnishings; and
- Supporting program and project managers as time allows and priorities dictate.

One person will be hired to manage the Capacity Building program, one person to manage the Markets Building program, and one person to manage RMC marketing and outreach functions. The remaining one to two individuals comprising the RMC staff will support the program managers and the Executive Director. RMC program staff will market and facilitate the delivery of services, as well as build consensus, relationships, and agreements among various parties at the local, state, and regional levels.

The focus of RMC program staff will be the ‘recycling’ part of recycling market development – understanding collection, processing and end-use issues; knowing who the market players and recycling resources are; building relationships with appropriate service provider partners; etc. As such, program staff will assemble and maintain the recycling marketplace information and knowledge needed to determine recycling

market development priorities, appropriate strategies for addressing them, and appropriate service providers and other players to execute the needed work. RMC program staff will participate in conveying such recycling market information to its clients and service provider partners and will coordinate work undertaken to achieve the Center's goals and objectives.

Service delivery to individual companies and municipalities will be carried out by RMC partners (including the parent organization) or RMC staff, depending on the needs of each specific client. An important staff role will be identifying a roster of partners, creating formal and informal relationships with these partners, and delegating specific tasks to the various partners as well as appropriate reimbursement. Staff will play a direct role in client-specific service provision when their substantive knowledge and expertise is called for (e.g., assistance in identifying recycling market barriers and opportunities for business planning purposes).

The Executive Director will build a staff selected based on their skills, capabilities, experience, and passion for serving the mission of the RMC. RMC staff should agree with principles of approach to recycling market development in Pennsylvania (as outlined in the Strategic Plan), should have an entrepreneurial, self-motivated approach to work, and in combination, should possess skills and capabilities in the following areas:

- Project management;
- Written and oral communication;
- Quantitative analysis;
- Research, information-gathering, and investigation;
- Program evaluation;
- Business and nonprofit administration (as needed to effectively manage the Center);
- Problem identification and problem solving through consensus building;
- Establishing and adhering to priorities;
- Writing and evaluating RFPs and administering contracts;
- Establishment and maintenance of effective working relationships with and among people having diverse backgrounds and knowledge, including RMC funders; and
- Marketing and promotion of recycling market development and services of the RMC.

In addition, RMC staff will be selected who have, in combination, knowledge and experience in the following areas:

Business/economic development:

- Understanding of the ways and needs of businesses, with particular understanding of manufacturing processes;

- Ability to understand and evaluate business statements, business plans, etc.;
- Knowledge of Pennsylvania ED and BD service providers, and their services and capabilities;
- Knowledge of both debt and equity financing community, what investors are looking for, and role of financing in business development.

Recycling/recycling market development:

- General understanding of recycling and recycling market development – particularly, a commercial understanding of the recycling industry;
- Knowledge about specific recyclable commodity supply and demand issues and players in Pennsylvania;
- Ability to assess market barriers and to understand when RMC is needed to address barriers;
- Knowledge of how to source secondary materials;
- Knowledge or ability to discern what recycling market development tools are appropriate in which situations;
- Policy analysis expertise and understanding of policy mechanisms and the political process;
- Understanding of environmental and policy issues surrounding use of targeted materials and their uses;
- Understanding of buy-recycled/procurement policies and methods; and
- Knowledge of regulatory issues surrounding the beneficial use of recyclable materials, facility siting, etc.

Technical research and development:

- Understanding of various properties of recyclable materials and virgin counterparts;
- Understanding of the research and development process and role/organizational interests of R&D service providers in overcoming identified barriers;
- Understanding of process of commercializing research efforts;
- Understanding of the R&D service providers (who the key researchers and testing labs are in the state and region);
- Ability to understand research and technical needs of manufacturers and link them with the best form of business or technical assistance.

Market research and marketing:

- Understanding of sales and marketing and role of market research as a tool as well as which other tools are appropriate.

Public policy:

- Understanding of approaches to the design of effective public policy.

The experience of other state recycling market development centers suggests that recycling market development personnel are more effective when they enter with business assistance and economic development skills and basic technical knowledge. Although it is important for some staff to have some recycling expertise and knowledge of the local players in Pennsylvania, other staff can be provided with information and training on recycling supply and demand trends and markets.

2.4 Partners

A significant portion of the work of the Recycling Markets Center will be to link client companies with service providers that can assist them in solving particular problems in such areas as business planning, finance, technical problem solving, product development and commercialization, market assessments, and materials sourcing. The RMC will select a limited number of service providers who will be considered Center "partners." These may include:

- Public and private business assistance organizations (public organizations include Team PA, Industrial Resource Centers and Small Business Development Centers; private organizations include business and economic development consultants and marketing firms);
- Public and private technical assistance service providers (public organizations include PennTAP; private organizations include commodity-specific trade associations, such as NAPCOR and AF&PA, and private recycling, waste management, and industry consultants);
- Researchers and testing laboratories;
- Finance organizations; and
- Community-based organizations.

RMC partners will provide more in-depth assistance to companies in their field of expertise than can the RMC alone. The RMC will pay partners as needed and mutually agreed upon for their time and services. However RMC partners will be expected to utilize their own resources for any work that would normally be undertaken as a part of their normal business activities. Other service providers in addition to the Center partners will be engaged from time to time to address the needs of specific clients or for specific project work that is outside the range of services effectively provided by the partners.

Given its role as funding provider and primary founder of the RMC, the PA DEP is a partner with a unique relationship to the RMC. The RMC will remain in communication with DEP staff to ensure good coordination between RMC and DEP programs, and to ensure that the RMC understands all DEP contract requirements and performance expectations.

2.5 Locations and Facilities

The parent organization and RMC Board of Directors will determine the Recycling Markets Center office location(s). It is anticipated that the Center initially will be housed in one office in Harrisburg, and strong consideration should be given to this location due to access to the General Assembly and Commonwealth agencies.

As the RMC develops, the value of physically locating one or more staff at the offices of a partner will be assessed, as well as having partner agencies loan a staff person to the RMC. Specifically, the potential benefits would be measured regarding directly placing staff in the field and as a liaison with other service-providing professionals.

Section 3
FINANCIAL PLAN

3.1 Financing Strategy

The primary source of funding for the first five years associated with establishing and operating the RMC will be the Pennsylvania Recycling Fund. The Recycling Fund has been created through a surcharge on each ton of material disposed in Pennsylvania. These funds are managed and allocated by the PA DEP. This guaranteed short-term funding will give the RMC time to focus on building its programs and results, and building a base of clients and constituents.

DEP will provide funding to the parent organization in the form of a grant, to initially establish the Recycling Markets Center. In addition, DEP (either directly or through its recycling market development consultant) will provide additional support in the form of management, technical advice and assistance in one or more of the following areas:

- Establishing and providing staff support to the initial RMC steering prior to selection of the parent organization;
- Providing technical input and facilitation assistance in the development of organizational bylaws, program work plans and budgets, and other policies and procedures and guidance documents;
- Participating in interviewing and hiring the RMC executive director and staff;
- Developing RMC program performance measures and a detailed evaluation plan; and
- Conducting periodic Center performance evaluations, once the RMC is operational;

Once the Center is operational, the RMC may receive funds directly through DEP or via the parent organization, depending upon the ultimate institutional structure established. DEP funds to the RMC will be utilized to support office overhead, staff, and programs.

Reporting mechanisms will be established to provide DEP with the means of ensuring appropriate use of DEP-supplied funds; however, RMC operations and expenditures of funds obtained from sources other than the Commonwealth will not be controlled by DEP.

During the initial five-year funding period, the RMC will explore additional sources of funds and develop a long-range funding plan. Long range funding sources may include: state and federal grants for economic development, technology development, and other relevant topics; foundation grants; contributions from trade associations and

other groups involved in co-sponsoring specific programs and activities; continued support from the recycling fund. Client fees are unlikely to be a top priority, especially in the short term; however clients and those receiving funds for specific projects may be expected to provide matching funds, which may include donated staff and equipment time.

RMC service provider partners will be expected to utilize their own resources in undertaking market development work that fits within the purview of their normal services, types of clients, etc. When work that they will undertake falls outside of the scope of their mission, the RMC will establish and/or broker the establishment of contracts to fund these activities.

In addition, RMC partners will be expected to assist in the identification of potential funding sources. By teaming to develop proposals, stronger more "marketable" proposals should result that cross the typical boundaries of environmental protection and economic development, and demonstrate a breadth of capabilities that would appeal to potential funding sources.

3.2 Budget

Once the parent organization has been selected and decisions have been made regarding the RMC's office location(s), the RMC's start up and operating budgets will be developed. The parent organization will be responsible for developing these initial budgets, with the input and assistance of the RMC development steering committee and DEP's recycling market development consultant.

Section 4
YEAR 1 WORK PLAN

The RMC's Executive Director and Board will be responsible for developing the initial and future annual work plans for the RMC. It is anticipated that the Year 1 workplan will contain the following work activities:

Months 1 - 3

- Establish RMC development steering committee.
- Recruit and appoint founding Board of Directors and conduct Board orientation session.
- Develop bylaws for Board approval.
- Establish initial financial and business record keeping systems (assumes this will be modified once office manger is on board).
- Secure funding.
- Set up the RMC office (secure site, furnishings, equipment, etc.).

Months 4 - 6

- Hire the RMC Executive Director.
- Develop initial communication pieces (after hiring Executive Director) (e.g., logo, letterhead, business cards, letters of introduction, RMC brochure, media releases, etc.) for use in informing stakeholders about the RMC's existence and services.
- Begin relationship-building process; obtain input on needs, opportunities, issues of concern, strategy ideas, etc.
- Using Phase I results, strategic plan and stakeholder input, select one or two target materials to serve as the initial focus of material-specific efforts.
- Set up physical and virtual library, database management, and other document/information management systems in the office.
- Undertake various information gathering and assessment activities to characterize the needs and interests of target client groups and other key stakeholders (including existing PA end users, target commodity industry representatives, and suppliers) and to determine priority barriers and opportunities to be addressed through RMC-led recycling market development activities.
- Develop a prioritized list of existing PA recycled product manufacturers that RMC staff will meet with one-on-one; begin series of meetings.
- Develop an RMC web site and work to establish links to this site from the sites of other organizations.

- Identify core service provider partners and convene first partners meeting.

Months 6 - 12

- Prepare 6 months status report to the Board of Directors and DEP.
- Create 1-year work plans and budgets for each of the three RMC programs, using guidance from business plan and strategic plan as well as results of listening process.
- Write job descriptions, and hire office and program managers, followed by remaining personnel.
- Launch initial RMC programs and services as outlined in work plans.
- Develop a repository of knowledge on specific areas of focus. This can include existing best practices, case studies etc. already completed by other market development or industry organizations.
- Work with DEP to update/augment processor and end user database.
- As deemed valuable through the needs assessment survey work, conduct discussion forums and seminars on specific areas (e.g., for specific target materials, specific processes, financing, etc.).
- Continue with partnership meetings to further clarify capabilities, roles and working relationships among partner group members.
- Establish processes for identifying and marketing services to target clients and link them with the appropriate service provider partners.
- Establish program measures and evaluation procedures, including client tracking procedures.
- Develop the Year 2 work plan.

Appendix A
MARKET INEFFICIENCIES

The following is a description of market inefficiencies that can be addressed through the programs and services of the Recycling Markets Center:

- ***Imperfect flow of information*** – Market players may make inappropriate decisions because of a lack of information, lack of access to existing information, or misinformation. For example, a manufacturer may not know that secondary feedstock can be substituted for virgin feedstock without negative consequences; a seller and potential buyer of secondary materials may not know of each other's existence; or an entrepreneur, economic developer, or venture capitalist may not fully appreciate the profit potential of a new recycling business.
- ***Uncertainty about future market conditions*** – Unknowns regarding the quantity, price and quality of secondary material supplies, about the demand for secondary materials and recycled products, and about forthcoming regulations and their impacts on markets can inhibit investment in recycling collection, processing or manufacturing capacity.
- ***Risk aversion*** – Financial investors of venture capital and debt finance have a wide range of choices regarding the types of businesses in which to invest. Some investors may decide to avoid investing in certain recycling businesses, with a perception that they are too risky, even if the investors are adequately compensated for the risk. Recycling business development is then inhibited by a lack of capital.
- ***Mispricing of materials and products due to undervaluing public benefits and/or costs*** – In efficient markets, the prices of goods fully reflect the costs and benefits to society. However, in the real world, prices usually reflect only the costs and benefits to the buyer and seller. The benefits of recycling that accrue to the public, e.g., conservation of resources, reduced pollution, and avoided landfill costs, are not incorporated into the price, leading to prices for secondary materials that are priced below their true value. In addition, there are certain costs of recycling, for example, the unpaid labor provided by residents in source separating waste, that are not reflected in the commodity prices. Mispricing of secondary materials and recycled products (reflecting what economists call "externalities") can constrain both supply and demand. In addition, mispricing of primary materials, by failing to internalize associated environmental and resource depletion costs and the impact of virgin subsidies, makes it more difficult for secondary materials to compete against primary materials in the marketplace. Likewise, failure to incorporate the associated environmental and resource depletion costs in the price of waste disposal services, such as landfilling, can inhibit recovery of secondary materials which affects the price of secondary materials supply.

- ***Inability to reach economies of scale*** – New recycled products are often manufactured in small production runs, reflecting low initial demand. However, small production runs can result in high per unit costs, which can keep demand low. If demand (or supply of input materials, in instances where insufficient feedstock is limiting production) were to grow, production runs can become larger, resulting in decreased per unit costs, which, if reflected in product price, would further stimulate demand.
- ***High transaction costs*** – Each transaction in the marketplace carries a certain cost, which may be low or high. Transaction costs can include information search time and expense (e.g., to find qualified buyers, assess market conditions, locate materials with suitable characteristics), legal and regulatory activities (e.g., obtaining permits, drawing up contracts), and transportation time and expense (of materials and people). In efficient markets, transaction costs do not prevent transactions from occurring. However, in the real world, high transaction costs can scuttle deals; market actors may decide that costs of carrying out the transactions exceed the likely benefits. For instance, a business may decide that the cost of delaying production in order to obtain environmental permits is too high, that long-haul trucking rates are too high to justify a deal, or that the time and funds needed to research markets are too high to consider developing a new product.
- ***Unrestricted nature of technical information*** – Technical innovation can lead to new levels of recycling activity through developing new recycled products and new collection, processing and manufacturing technologies. However, despite the protections of the patent system, technology development can be inhibited if it is thought that competitors can replicate innovations at a low cost. Technical information is a "public good," that is, it is inexpensive or free to obtain and use unless well hidden from competitors or guarded by legal protections. In addition, because of this, many companies are unwilling to share technical information.

Appendix B
ASSESSMENT OF INSTITUTIONAL OPTIONS

In determining the Recycling Markets Center structure, the following organizational characteristics were identified as important to the success of the Center:

- Able to provide critical services;
- Organizational mission supporting full range of recycling market development work;
- Recycling market development activities are an organizational priority not vulnerable to being superceded by other priorities;
- Minimal conflict of interest, particularly pertaining to allocation and use of funds;
- Has the trust and respect of other organizations with interests in recycling market development in Pennsylvania;
- Ability to attract and serve full range of clients that might benefit from recycling market development assistance;
- Ability to build ties with companies and other partners;
- Ability to attract, receive, and be held accountable for funds from various sources and DEP in particular;
- Ability to allocate, in a timely fashion, funds for contracts, grants and/or loans to public and/or private sector entities;
- Ability to enter contracts with public, nonprofit, and private service providers;
- Ability to be flexible and responsive to changing market conditions;
- Ability to advocate on behalf of recycling market development in Pennsylvania;
- Ability to attract and retain staff with needed skills;
- Ability to maintain client confidentiality;
- Political and institutional feasibility.

Several organizational options were considered for the Recycling Markets Center with respect to their ability to have the above characteristics:

- Establish a public purpose corporation (e.g. an authority) to serve as the Center;
- House the RMC within an existing nonprofit organization;
- Establish a new nonprofit organization to serve as the RMC;
- Operate the RMC as a program of an existing agency of the Commonwealth;
- Operate the RMC as a program of an existing agency University/ College;

- Operate the RMC as a program of an existing private sector organization or service provider.

In assessing these options, representatives from existing Pennsylvania organizations were interviewed about the effectiveness of their organizational structures and their opinions regarding an appropriate structure for the RMC. In addition, Internet research was performed to examine the structures of various existing organizations as well as their purpose, mission, and programs. A survey of existing state recycling market development programs was undertaken to determine structural approaches used by other states. Reports for the Chelsea Center for Recycling and Economic Development and the Clean Washington Center entailing an evaluation of institutional options were reviewed and pertinent findings noted.

Three options were short listed and given more detailed consideration:

1. *Operation of the RMC as a program of an existing agency of the Commonwealth;*
2. *House the RMC within an existing Pennsylvania organization;*
3. *Establishment of the RMC as a public purpose corporation.*

Based on this research and analysis, it was determined that there is no sole "right" structure for the RMC. In other words, several different types of structures are feasible, with each having a different set of pros and cons. Of the three options evaluated in greater detail, establishment of a public purpose corporation (Option 3) was determined to possess the greatest compliment of desired characteristics; however this option was also considered to be the most difficult and time-consuming to implement, given that legislative action would be required. Option 1 (program of an existing state agency) was regarded as the easiest to implement. However it is the least desirable of the three short-listed options, due to limited operational flexibility and negative perceptions on the part of recycling market development stakeholders regarding the ability of such a program to maintain client confidentiality, understand and be responsive to the needs of businesses, and operate independently of Commonwealth regulatory agencies. Option 2 (housed within an existing PA organization) was determined to offer the most positive combination of advantages and disadvantages, assuming a suitable interested parent organization could be identified. With regard to this option, creation of the RMC as a nonprofit subsidiary of the parent organization merits particular consideration. This approach to establishing the RMC offers the advantages of being part of a larger organization, while providing the autonomy and mission focus associated with an independent nonprofit.

Appendix C
EXECUTIVE DIRECTOR POSITION DESCRIPTION

The Executive Director provides the primary executive, strategic, representational and fundraising leadership for the Recycling Markets Center. The Executive Director's role is to ensure the viability and growth of the organization while overseeing day-to-day operations. The Executive Director will set the vision of the organization, steer the organization towards that vision, hire and supervise staff, and build relationships with prospective clients, service provider partners, and other stakeholders with roles to play in recycling market development in Pennsylvania. The Executive Director reports to the Board of Directors.

Qualifications

The RMC executive director should be a service-oriented individual with a passion and commitment to the mission and programs of the RMC, creative vision, ability to think innovatively and strategically, a strong sense of humor, and dynamic leadership abilities. In addition, the successful applicant will be able to: unite individuals around the RMC's mission; work in a collaborative manner with diverse constituencies; facilitate strategic alliances; work with an active and involved Board of Directors; manage and motivate staff.

Skills and Experience Needed

- Excellent written and oral communication skills used in letter and report writing, outreach, marketing and public speaking;
- Strong interpersonal, social and supervisory skills;
- Strong capability with strategic visioning and short-term planning;
- Demonstrated ability to develop, manage, and successfully complete multiple, complex programs and projects operating simultaneously;
- Experience in budget development and administration and fund development;
- Familiarity with state government administrative procedures, and with Pennsylvania environmental and/or economic development agencies.

Major Functions/Accountabilities

Planning and Operations:

- Develop and implement a long-term plan for the financial health of the organization.
- Oversee development of the annual budget for the organization.
- Ensure that the organization works within its budget.

- Directly oversee the recruitment, hiring, training and supervision of the RMC staff.
- Maintain a work environment that attracts, retains and motivates high-quality staff.
- Oversee design, development, promotion, delivery, and quality of programs, products and services.
- Work with the Board of Directors to ensure adequate personnel policies, oversee staff performance appraisals and mediate resolution of any staff conflict.
- Stay abreast of significant developments and trends affecting the work of the RMC.

Administration:

- Oversee management of the organization's functions, including: budgets, employee payroll records, taxes, grants, database, and board meetings.
- Oversee maintenance, as appropriate, current employee payroll records, tax records, and other financial records.
- Administer grants.
- Develop personnel policies (or use those of parent organization).
- Ensure that employee relations and functions are in compliance with all governmental regulations and the RMC's personnel policy.

Fundraising:

- Develop annual financing strategy in collaboration with staff and board.
- Develop and maintain relationships with current and prospective funders.
- Oversee grant planning, writing and implementation, including identifying resource requirements, establishing strategies to approach foundations and ensuring grant obligations are met.

Communications and Marketing

- Assure that the RMC and its mission, programs, products, and services are consistently presented in strong, positive images to relevant audiences.
- Serve as the primary liaison to funding and partner organizations, contractors and clients.
- Serve as liaison to other organizations doing related work.
- Market the RMC through presentations, in-person contact, and partnerships with the business community and waste reduction and recycling organizations.
- Give presentations at meetings and conferences.

Board Administration and Support:

- Work with the Board and staff to ensure that the organization has adequate resources to complete its work.
- Support operations and administration of Board by advising and informing Board members, and serve as liaison between the Board and staff where appropriate.
- Work with the Board to undertake long-term organizational and strategic planning.

Education:

A Master's Degree in administration, business, public policy or another appropriate field related to RMC's mission, and at least three years of experience related to managing organizations, recycling market development, business assistance, economic development, business financing, and environmental policies and programs.

or

Bachelor's degree plus a minimum of five years of experience related to recycling market development, waste management, business and economic development, business financing, and environmental policies and programs.

Sample of Written Work No. 2

Business Assessment Conclusions

January 2002

Prepared for: Minnesota Office of Environmental Assistance

Prepared by: AMPros Corporation

Included as Exhibit II to R. W. Beck's Proposal for:

California Integrated Waste Management Board
Tire-Derived Product Business Assistance Program

Contract No. IWM05030

R·W·BECK

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January 2002

Business Assessment Conclusions

GENESIS MANUFACTURING INC.

Asset Recovery Corporation
Computer Recycling and Remarketing

PHOENIX RECYCLING CORPORATION

Hi-Tek RUBBER, INC.

RPI
Recycled Plastics, Inc.

Pike Companies, Inc.

Minnesota Office of Environmental Assistance

RELEASE AND INDEMNIFICATION

The Company agrees to indemnify and save hold AMPros Corporation, and Minnesota Office of Environmental Assistance, and Minnesota Technology, Inc., its agents and employees harmless from any and all claims or causes of action arising from the Company's use or other activities regarding the information, advice, technical help or other assistance provided to the Company by AMPros Corporation, and/or Minnesota Office of Environmental Assistance, and/or Minnesota Technology, Inc., Additionally, as consideration for the assistance provided to the Company by AMPros Corporation, Minnesota Office of Environmental Assistance, and Minnesota Technology, Inc., the Company agrees that it will not assert any claims or causes of action of whatsoever nature against AMPros Corporation, or Minnesota Office of Environmental Assistance, or Minnesota Technology, Inc., resulting from, or in any way related to, assistance provided to the Company by AMPros Corporation, or Minnesota Office of Environmental Assistance, or Minnesota Technology, Inc.

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INTRODUCTION

Volume, value-added, cash and a dash of diversity. Blend effectively with people and processes. This is the recipe for successful recycling companies.

OEA objective for the business assessments: The Minnesota Office of Environmental Assistance (OEA) awarded a grant in 1999, (project ID EB99005) to conduct comprehensive business assessments of six Minnesota recycling companies, providing the companies with an external perspective of business operations and offering recommendations for long-term success. Successful recycling businesses will help Minnesota achieve its goal of resource conservation and landfill abatement through recycling market development. AMPros Corporation was the grant recipient and service delivery resource, and Minnesota Technology, Inc., provided technical support.

What is a business assessment? It is a comprehensive examination of all business aspects as currently implemented and planned with delivery of prioritized recommendations that lead to superior performance and goal achievement. The company confidential assessment report is a 50 to 70 page document that details assessment results and recommendations. Attachment A lists typical subject matter covered in the detail report. A public version was released as an executive summary and is included in this summary report. Some companies use the detail report as an operational guide to track improvement against recommended actions while others use it as the starting point for developing a business or strategic plan. Assessment topics cover financial, operational, marketing and owners' personal goals. Time to conduct and complete an assessment range from a few weeks to several months depending on how quickly the individual company responds to data requests.

METHODOLOGY

How is an assessment performed? Assessment includes acquiring and reviewing existing business plans, strategic documents, marketing materials, financial statements including accountants' notes, policies, procedures, reports, forms used, employee manuals, quality assurance plans and any improvement activity documents. Where possible, data is acquired in electronic form such as database, text or spreadsheet files.

Further augmenting the data gathering process are one-on-one interviews with personnel representing all functions and business processes. This involves 30% to 100% of the employees at each company. Each person is asked two basic questions. What occupies your time on a daily or weekly basis and then instructed to put on the "owners' hat", and asked what would you do to improve business performance, make it a better place to work or otherwise make it more profitability? A surprising number of employees at all levels were attuned to costs and the need for profitable growth. Summarized results of the interviews were given to company management for use in improving management policies and focusing on employee identified issues.

In almost all cases, company goals were revealed only after an extended interview with ownership and executive management.

Financial performance is evaluated for prior three to five years and the trends compared to business long-range goals. A ratio-based forecast projects from current performance, with interim period corrections, to finally arrive at three to five year business growth goals as expressed by the business ownership. Ratios used for the forecast process are consistent with industry standards for manufacturing companies that employ processes similar to the assessed company to the extent possible considering there is no standard financial performance data for the recycling industry. In all cases, the financial projection is designed to move the company into average to superior financial performance. Financial ratios used in

the forecast process include asset utilization, profitability, working capital related ratios, solvency and liquidity ratios. Over 60 performance ratios are computed and used as the basis for certain operational recommendations. One performance indicator is the "Z-Score", a commonly used predictor for establishing company viability and ability to survive over the next one to three year period. Z-Score predicted problems with two of the companies that participated in the assessment process.

In addition to financial analysis, operational, marketing and management dimensions are also examined to determine the current performance situation, then compared to where the company ownership desire to take the company over the next three to five years. Comparing and contrasting current to future situation result in prioritized recommendations for actions the company must undertake in order to successfully achieve long-term goals. All data acquired is treated as company confidential and not shared with other companies or third parties.

The assessments are comprehensive yet varied in the level of detail exploration required to reach a valid conclusion about the company current and future situation. In some cases, data is readily available while in others it is necessary to perform detail process and cost analyses. For example, initial data gathering revealed lack of process and product data in some cases and it was necessary to develop process flow charts, assign resource costs and develop overhead cost models to establish realistic product cost and profitability models. These efforts are time consuming but necessary actions that provide the company with a baseline from which to work in formulating corrective actions and management strategies that move the company toward stated goals.

CONCLUSIONS

Six companies volunteered to participate in the business assessment process. All participants expressed gratitude and were very pleased with the knowledge gained, particularly related to prioritized actions that they must undertake to achieve long-term goals. They were very open and cooperative in delivering required data and providing access to employees. There was a genuine desire to benefit from insight gained from the assessment process that help achieve their vision for the company. To the extent possible and within the limitations of available resources, all companies moved forward immediately in addressing the prioritized recommendations. In fact, companies completed some recommended actions while the assessment was still in progress.

Two of the companies were on shaky ground at the time of the assessment and, failing to gain a cash infusion, have since failed. Two companies have solid business models in place and appear to be successfully moving forward toward achieving their long-term goals. Two companies are basically startup businesses that show a great deal of promise but have yet to demonstrate long-term viability.

So ***what is the difference between the companies*** in terms of individual business models and fundamental practices? ***Recycling business models can be expressed in terms of two characteristics, volume and value-added***. There obviously is a volume dimension associated with value-added but it is much smaller than the volume associated with the business model where the product is low value such as flake or pelletized plastic materials. For example, a business model that focuses on material recovery and/or processing has a product value that is measured in cents per pound. Each time a material is handled or sorted or baled or ground or washed adds a few cents cost per pound. When added up, the cost to handle and process recyclable materials result in total cost that is at best only a few cents less per pound than the sale price of the process material. Since there is a certain level of "fixed" cost associated with any business, it is necessary to process high volumes of material to offset the fixed cost then process an additional volume in

order to achieve overall profitability. Failure to achieve cost efficient processing simultaneously with high volume output leads to unprofitable operations. In addition, market constraints put a cap on salable material prices, which takes pricing flexibility away from the company that follows the material recovery volume-driven business model. The successful business in this arena must efficiently process 2 million or more pounds per month and deliver a high percentage of processed material as a salable raw material for use in a value-added product.

A ***thorough understanding of cost and cash flow requirements is essential***. For example, it was determined in at least two cases that cost was underestimated and pricing strategies were in place that sold products for less than it cost to produce. Compounding this situation was a continually worsening cash flow situation that eventually resulted in over extension of credit and finally insolvency. Fundamental attention to managing both income statement and balance sheet components was necessary but perhaps not fully understood and probably driven initially by incomplete understanding of the costs incurred to produce and deliver products.

A variant of the volume driven model is one that focuses on higher value recyclable items. Such as, computer electronics and electronic components that have a higher market potential than flakes and pellets derived from plastics. This is the model followed by Asset Recovery Corporation that has proven successful as compared to Phoenix Recycling Corporation which has proven unsuccessful. Both are volume driven, but one has higher inherent product value than the other.

Another factor is product diversity. The model that focuses on one or two product lines is more at risk than one that is offering an array of products in combination with some sort of value-added product or service. This is well reflected in the business philosophy expressed by Asset Recovery Corporation owners, "Ensure company is diversified to weather small market variations and positioned to quickly take advantage of emerging trends and opportunities, as long as they are economically profitable." The philosophy has suited them well over the past decade and is appropriate for any company participating in the recycling industry.

At the value-added end of the spectrum are those companies that use recycled materials as a raw material in the production of an item that has market appeal and a market willing to pay a reasonable price. Four companies had value-added products. One has failed, one is on the road to success and two are in the startup mode. The failed company had a good product but the main customer dictated pricing, which was lower than it cost to produce the product. This was an immediate cash flow problem. Further, company expansion was hindered by insufficient cash flow to allow for hiring necessary personnel required to manage and run multi-shift production operations. Consequently, existing personnel, including the owner, was overextended and unable to fulfill all demands of the business.

The company that is solidly on the success track converts recycled flake and pelletized plastic materials into sheet products and also cuts products from these sheets for use in the marine industry where plywood suffers from environmental degradation. This company fully understands its cost, has put in place effective management and improved process efficiencies. Barring unforeseen economic hazards, this company should continue to be a recycling success story.

The two startup companies have substantially altered perspectives as a result of the assessment. In both cases, the assessment evaluated process capabilities and costs resulting in better

Fiscal Period / Calendar Year	Full Time Equivalent Employees	Total Revenue
2001	103	-
2002	187	$22,561,000
2003	257	$40,767,000
2004	333	$45,524,000

understanding of their potential for financial performance. Pricing scenarios were altered in one case while production volume capability was challenged in the other. Both companies are making progress toward volume production but actual success will be measured by their performance in fiscal period 2002.

One outcome of the assessment process and financial performance forecasting is a prediction of personnel required each year over the forecast period. The following table lists the composite forecast for full time employees (including new jobs) and total revenue projected for the surviving recycling companies. Current national economic conditions may delay timing to achieve results but the companies that follow the assessment recommendations should over the next few years achieve projected performance.

An ***overall conclusion is*** that the cost and effort to conduct a ***comprehensive business assessment yields high returns over a multi-year period*** in terms of sustainable business growth, profit generated and jobs created. It challenges or validates preconceptions about the business plans. It refocuses attention to issues critical to the business long-term success. It provides financial guidelines to achieve superior performance.

A recommended action, independent of the assessed companies, is that a standard set of performance data should be developed for

PARTICIPATING COMPANIES

Who participated in the assessment process? Companies participating in the business assessment process are listed below along with a synopsis of company background. Additional overview information along with goals, conclusions, critical success factors and recommendations are presented in the concluding section of this report.

Asset Recovery Corporation

Founded in 1987, Asset Recovery Corporation is a Minnesota Subchapter "S" corporation located at 150 State Street, St. Paul, MN 55107. The company processes and recovers electronic components and equipment for reuse or resale. They also provide product "End of Life" services for manufacturing companies that are phasing out obsolete product lines. The company services span the Office of Environmental Assistance firm types of broker, material recovery facility and processor.

Genesis Manufacturing, Inc.

Founded in 1997, Genesis Manufacturing is a Minnesota Subchapter "S" corporation located at 700 West 12th Street in St. Charles, MN 55972. Company reclaims and recycles selected plastic materials from the medical industry waste stream for the express purpose of manufacturing value-added products such as cushion tiles and cylinder molds. Services provided span the Office of Environmental Assistance firm types of processor and manufacturer/end user. Note, company filed bankruptcy approximately one year subsequent to completion of assessment.

Hi-Tek Rubber, Inc.

Founded in 1999, Hi-Tek Rubber is a Minnesota "C" corporation located at 28433 Hwy 65 N.E. in Isanti, MN with manufacturing facilities in Ogilvie, MN. The company uses selected plastics and rubber from recycled tires to manufacture simulated slate and cedar shake shingles for the high-end residential and commercial building industry. Hi-Tek Rubber falls under the Office of Environmental Assistance firm type category of manufacturer/end user.

Phoenix Recycling Corporation

Founded in 1989, Phoenix Recycling Corporation is located at 2823 N. Fairview Ave in Roseville, MN. Company focus is on reclaiming and recycling plastic materials from the residential and industrial waste stream for use as a raw material by manufacturing firms. Company services fall within the Office of Environmental Assistance firm types of broker, material recovery facility and processor. Note, company filed bankruptcy approximately one year subsequent to completion of assessment.

Pike Companies (Nylon Board Manufacturing, Inc.)

Incorporated May 9, 2000, Pike Companies is a Minnesota Subchapter "S" corporation located at 7832 21st Avenue NW, Medford, MN 55049. Company officially named Nylon Board Manufacturing, Inc. in September 2001 as a division of Pike Companies, Inc. Focus is transformation of nylon carpet from post consumer and industrial sources into 4ft by 8ft sheet stock for use where plywood suffers from environmental degradation. Company services span the Office of Environmental Assistance firm types of processor and manufacturer/end user.

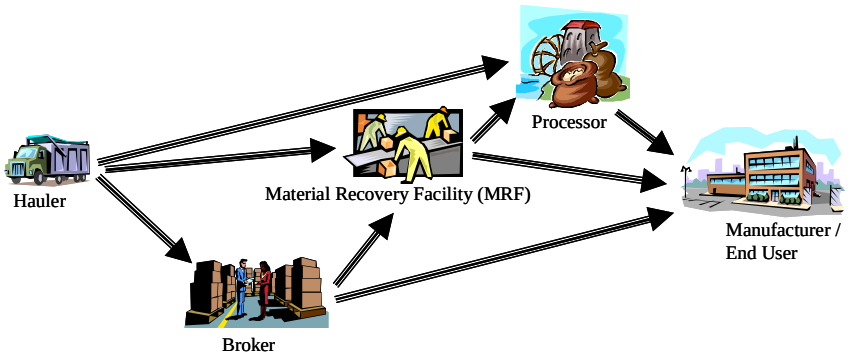
Recycled Plastics, Inc.

Founded in 1991, Recycled Plastics, Inc. is located at 609 County Road 82 NW in Garfield, MN. Company transforms recycled plastic material into both sheet stock and manufactured parts for use in the marine industry where wood suffers from environmental degradation. Company falls within the Office of Environmental Assistance firm types of processor and manufacturer/end user categories.

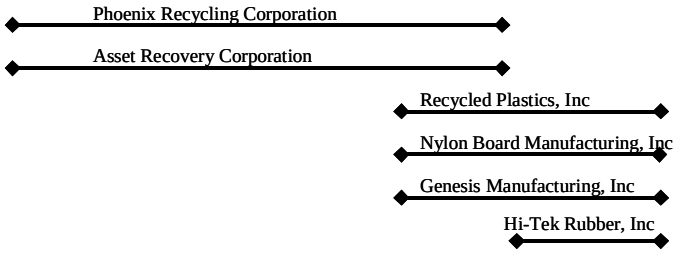
FIRM TYPES

(Minnesota Office of Environmental Assistance; Minnesota Recycling Markets Directory, 2000 edition)

Each company is classified by firm type which represents the basic nature of the business processes and products. The firm type definitions are presented as bulleted items below followed by a graphic which illustrates the span of services and processes encompassed by each company in this assessment project. A listing of other recycling companies by firm type is available through Minnesota Office of Environmental Assistance by calling 800-657-3843 or visit their website at www.moea.state.mn.us and look for Minnesota Recycling Markets Directory.



Range of Services Provided by Company



- **Manufacturer / end-user:** a company that uses recyclables as a raw material (feedstock) to make new products.
- **Processor:** a company that prepares recyclable materials for market in a value-added way.

- **Broker:** a company or individual that consolidates and then sells recyclable material to an end-user. A broker may buy or accept materials from a company or individual without necessarily acting as their hauler.
- **Material Recovery Facility (MRF) or Recycling Facility:** a company or county facility that separates and prepares recyclable materials for shipping to a processor or end-user.
- **Hauler:** a company that collects recyclables from residential and/or commercial customers.

PROJECT ECONOMICS

OEA grant was for $50,000 with matching contributions from project participants. The grant was spread evenly over the assessed companies for an average of $8,333 OEA cost contribution per assessment. Each company provided in-kind contribution through labor hours of participating employees or through investments in assets or improvements that resulted from the assessment report. This contribution was at least $82,855 at project conclusion which more than met the grant match requirement. Total actual cost for all assessments exceeded $300,000. Labor effort to conduct all assessment activities resulted in approximately four hours of consulting time for each hour expended by participating company employees.

The timeline and actual cost range for each assessment is summarized in the table below. The "start" time is the date of first visit to the company in preparation for assessment activity. In some cases, the company was unable to proceed with actual data acquisition activity for several weeks or even months after first contact. Assessment duration time was also influenced by the availability of required data which in a few cases took several weeks to compile by company personnel and additional time to consolidate by AMPros Corporation. There is a direct correlation between actual assessment cost and ability of the assessed company to delivery requisite data.

Actual cost is also heavily influenced by the quality of data provided versus what is required to assure that the assessment generates a valid conclusion and recommendation. For example, much more detailed analysis was required for Phoenix Recycling Corporation and Genesis Manufacturing, Inc. to understand cost and profitability than for Asset Recovery Corporation or Recycled Plastics, Inc.

Complex company processes & multiple product lines increase assessment cost while well documented processes and management understanding of detailed cost and profit sources

Company	Start	Report	Cost Range
Genesis Manufacturing	8/10/1999	4/6/2000	$71,000 — $100,000
Phoenix Recycling Corp	8/18/1999	7/17/2000	$71,000 — $100,000
Recycled Plastics Inc	8/2/2000	2/5/2001	$51,000 — $70,000
Pike Companies (Nylon Board Manufacturing, Inc.)	5/15/2001	11/30/2001	$30,000 — $50,000
Hi-Tek Rubber Inc	5/23/2001	7/31/2001	$51,000 — $70,000
Asset Recovery Corp	6/25/2001	8/31/2001	$30,000 — $50,000

Asset Recovery Corporation

BUSINESS ASSESSMENT EXECUTIVE SUMMARY

This report section provides an overview of the assessed company and insight into the strategic direction expressed for the business. Business objectives are followed by conclusions derived from current observations and analysis of past performance. Comparison of goals versus capabilities and forecast results yields insight into the critical factors that must be addressed by management in order to achieve stated objectives. In some cases, the implied objective of long-term survival dictates near-term actions that may not be expressly stated by company ownership.

Recommended actions are intended to move the company toward stated objectives while improving financial performance to be equal or superior to the average company that competes in the same market segment. SIC code and other public data is used for comparative purposes since there is no specific reference data for recycling companies.

Disclaimer: Following recommended actions cannot guarantee success but rather serve to guide management around pitfalls that otherwise could lead to negative and possibly devastating results.

COMPANY PROFILE AND BACKGROUND

Founded in 1987, Asset Recovery Corporation, is a Minnesota Subchapter "S" corporation located at 150 State Street, St.Paul, MN 55107. The company can be contacted via phone number 651-602-0789, or fax number is 651-602-0202. Asset Recovery also maintains an Internet presence with a web site address of www.assetrecoverycorp.com.

Company genesis was from electronic equipment recycling efforts originally performed internal to Unisys Corporation. Thomas Gujer and Cort Jerome organized the founding of Asset Recovery after Unisys determined that it no longer wished to fund and manage the recycling and reclamation activity within its own company structure. The company grew and expanded to operations in Phoenix, Arizona and Atlanta, Georgia. Managing these remote operations was cost ineffective so the company contracted to a single facility in 1997 while continuing a national electronic equipment recycling service including the St. Paul, Minnesota and surrounding metro area. Other partners were active in the business until 1998, at which time an agreement was made that permitted Tom and Cort to buy the business outright. It was at this time the company organized as a subchapter S Corporation.

The company initially focused on recovering precious metals and bulk commodity materials then evolved to higher value services associated with reselling electronic equipment and components. Further driving the business was the growing awareness and increased government regulation of hazardous waste disposal. This lead to another avenue for revenue generation as a special waste disposal service for consumer electronics, personal computers and monitors. Primary focus has been on serving government, commercial and industrial customers with exploration of residential service. The company maintains a public drop-off service for electronic devices and actively supports community clean-up activities. However, current attitudes and reluctance to pay for recycling electronics by the residential sector does not make this area economically viable as a major business focus at the present time.

Long range goals drive the company toward modest growth supplying a range of products and services including "End of Life" product maintenance services, equipment re-deployment and recycling of used equipment and components. Internet sales and management of company employee sales are other facets of Asset Recovery's business activity. A market brochure is available from the company that details the range of services provided or the interested

OWNER'S OBJECTIVES

The owner's objectives for the business can be classified under the categories: Business Growth, Market, Operations and occasionally Personal. Goals were derived from the assessment interview process as well as from financial statements, planning documents and other information provided by company management.

Owner Business Philosophy: Ensure company is diversified to weather small market variations and positioned to quickly take advantage of emerging trends and opportunities, as long as they are economically profitable. Continue focus on what's good for business by using common sense consistent with past management practices. Manage business and maintain within single localized physical facility except where business opportunity dictates otherwise.

Operations:

Operations cover all aspects of administration, managing and operating the manufacturing facilities. Goals may also embody sub-goals or require additional definition as indicated by bulleted items within each enumerated goal.

1. **Evaluate** current processes for cost effectiveness. Answer question as to what is being done versus what needs to be done.
   - Improve overall efficiencies in cost.
   - Better understand expenses so that can manage activities & processes to maximize profit.
2. **Define and implement** efficient processes that support business market and growth goals.
   - Need better timing of knowledge to know whether or not a particular Buy/Sell transaction was profitable.
3. **Develop** metrics and measure process outcomes for compliance with expected and desired results.
   - Improve & fine tune processes to a higher productivity level. Achieve consistency in outcome, quality & profitability. Implement means for follow-up to assure processes are working as designed and desired.
4. **Develop** position descriptions to **stabilize** work force and discern skill requirements. **Establish** strategy for full time and/or temporary employee acquisition and skill development.
   - Offload day to day activities to capable management so that owner's can deal more with strategic issues.
   - Resolve full time versus temporary labor usage and expense compared to profitability and productivity benefits.
   - Continue scrap line and low skill jobs as temporary labor. Keep lookout for potential to hire capable full time employees.
   - Empower employees to extent possible. Continue to provide opportunities to challenge employees with fun team building activities. Build inter-departmental communications.
5. **Develop and implement** vehicle for communications that convey individual impact on overall business performance.
6. **Provide** means on Internet for people to shop & buy that reduces support costs while improving shopping convenience.
7. **Analyze and determine** cost and operating impact associated with exceeding government 40 full time employees threshold.

Market:

1. **Explore & develop** business model with target toward growing "End of Life" and equipment re-deployment service along with wholesale market sales.
   - Determine how "End of Life" management should work to deliver maximum customer benefit and yield optimal profit.
   - Push OEM sales.
2. **Focus** on developing high value product or service. **Assign** dedicated resource to figure out how to develop and accomplish goal.
3. **Manage** internal employee sales for companies. **Establish** exclusivity for company, then manage cost to support with Internet order fulfillment.
4. **Explore** strategic partner opportunity for "Residential" recycling services where potential partner has a national presence with logistical infrastructure already in place.
5. **Evaluate** "Residential" recycle position &

Internet sales potential. **Determine** profitability potential for "Residential" and define how to manage. **Continue** residential drop-off and community cleanup services.

Business Growth:

1. **Double** revenue in next 5 years equivalent to approximately 9% to 10% growth per year. Profitability = 10% pretax.
2. **Maintain and improve** product "Pre-sell" philosophy by 5% per year. Avoid "buy to inventory" to greatest extent possible.

Personal:

1. **Develop** owner exit strategy from business with a 5 to 7 year time horizon.
2. **Develop** business to point where someone would buy out company. Solidify retirement.

CONCLUSIONS

1. Asset Recovery is well run delivering economic performance equal to or superior to industry standards for companies employing similar processes.
2. Asset Recovery's business model has demonstrated validity that promises success in the future assuming the company maintains multiple revenue streams from a variety of products and services yet remains flexible to take advantage of new opportunities.
3. The company is committed to relatively conservative growth to the extent that growth is economically viable and profitable. Goals are consistent and appear realistic compared with past practices and performance.

CRITICAL SUCCESS FACTORS

Critical success factors are those few things the business must absolutely and successfully address or there is a strong probability that the company cannot achieve its long-term objectives.

1. Purchasing practices that lower cost of goods sold for purchased equipment and items are essential.
2. Reduce number of times material is handled and moved from time of receipt through shipping.
3. Validate cost benefits of using trailers versus expanded facilities for managing inventory and temporary storage.
4. Revenue streams must favor a mix that delivers a greater sales portion from higher-value products and services.
5. Company must grow revenue at a rate that compensates for inflation, labor and material cost increases in order to achieve historical pre-tax profitability levels.

RECOMMENDATIONS SUMMARY

Recommendations are presented in priority order for focused implementation actions. The first set of recommendations tends to take priority over the next set but in practice several recommended actions could be carried out simultaneously.

The priorities were established by assessing which actions provide the most immediate benefit or are necessary to enable the next set of recommended actions. These actions should be incorporated into a written Business Plan including supporting Strategic and Marketing Plan to guide all employees in accomplishing the business growth goals. A summary listing is provided below and followed on subsequent pages with a more detailed presentation and discussion.

Company priorities are Operations driven first followed by Market then Business Growth. For the most part, company owners recognize which actions must be addressed as is evident in stated goals. Therefore, many of the recommendations mirror company goals.

Operations:

- ***Improve purchasing practices*** to achieve total materials & purchased items equal ***to 31% or less of revenue.***
- ***Develop high level process flow charts*** of total business then ***identify associated costs*** as means to define and measure improvement opportunities.
- ***Reduce material handling activities*** and evaluate cost benefits of using trailers for temporary storage versus added facility space for managing incoming materials and inventory.
- ***Assess asset requirements*** needed to support revenue growth for each product group**.**
- ***Develop strategy for work force stabilization and productivity improvement*** including position descriptions and accountability definition. Strategy should also address cost/benefit tradeoff analysis for using temporary versus full time employees.

Market:

- ***Generate 25% improvement in higher value product/service sales*** as measured by revenue per pound of material processed or other appropriate metric.
- ***Enforce "pre-sell"*** marketing and business ***philosophy*** and promote rapid turnover of inventoried items.
- Establish process to ***measure profitability of each sales transaction*** in a timely manner that supports decision making on subsequent sales activity.
- Explore and select best means to ***deliver "End of Life" and "Asset Re-deployment" services***.

Business Growth:

- ***Improve revenue by approximately 9.2% per year.***
- ***Improve Cost of Goods sold from 56% to 54%*** where COGS is defined according to the classification included in the detail (company confidential) section of this report.
- Hold total ***expenses to minimal growth not to exceed 3% per year*** in order to achieve pre-tax profit goal.
- ***Develop ownership exit strategy*** consistent with personal and business goals.

Genesis Manufacturing, Inc.

BUSINESS ASSESSMENT EXECUTIVE SUMMARY

This report section provides an overview of the assessed company and insight into the strategic direction expressed for the business. Business objectives are followed by conclusions derived from current observations and analysis of past performance. Comparison of goals versus capabilities and forecast results yields insight into the critical factors that must be addressed by management in order to achieve stated objectives. In some cases, the implied objective of long-term survival dictates near-term actions that may not be expressly stated by company ownership.

Recommended actions are intended to move the company toward stated objectives while improving financial performance to be equal or superior to the average company that competes in the same market segment. SIC code and other public company data is used for comparative purposes since there is no specific reference data for recycling companies.

Disclaimer: Following the recommended actions cannot guarantee success but rather serve to guide management around pitfalls that otherwise could lead to devastating results.

COMPANY PROFILE AND BACKGROUND

Genesis Manufacturing, Inc. is a Subchapter S company located at 700 West 12th Street in St. Charles, MN, 55972. Jeffery Steiner, along with Cindi Steiner, founded the company in 1997 for the express purpose of reclaiming and recycling plastic materials from the medical industry waste stream. A formal business plan submission to the Small Business Administration in September 1997 along with a request for an equipment loan was approved leading to the purchase of recycling and injection molding equipment. Mr. Steiner has worked extensively with the Minnesota Office of Environmental Assistance, Mayo Clinic, larger plastics manufacturing companies and major waste collections companies to develop both a material source and customer base for value added end products and recycling services provided by Genesis Manufacturing.

The company currently leases 5600 square feet of manufacturing space and 1200 square feet of administrative space. Major equipment includes two 500 ton, one 200 ton and one 75 ton injection molding presses along with recycling equipment such as the 40 Hp granulator, a wash & dry unit and box filler. Genesis Manufacturing provides materials pick up and delivery of finished product within a 300-mile radius around St. Charles, MN. Multi-shift operation is employed to maximize production efficiency and meet customer demands.

Flexible floor tiles and concrete cylinder molds are two products currently produced from recycled plastic materials. Flexible tiles are used as strain relief padding for standing animals as well as for people. The tiles are also found in the entryway of many stores where they serve as a “walk off” area for dirt, snow and sludge. The cylinder molds are used by the construction industry to cast standard size concrete shapes that are subsequently tested for compliance to strength specifications.

Additional products & services are under development that use decontaminated medical wastes as the source material. The resins reclaimed from these waste streams will be used in either existing injection molded products or sold as stock material to other value added manufacturers.

OWNER’S OBJECTIVE

The owner’s objectives for the business can be classified under four categories: Business Growth, Market, Operations, and Personal. Goals were derived from the assessment interview process as well as from financial, planning and other documents created by company management.

Business Growth:

- Business growth was expressed as pounds of waste processed rather than revenue and profit. Conversion to equivalent revenue yields target revenue of $1.2 million in 2000 to $2.6 million in 2004.
- Forecast and recommended retained profitability grows from a net loss in 1999 to 3.75% in 2000 and 7% in 2004.

Market:

Market focus is on plastic resin reclamation services and replacement of existing products with equivalent items manufactured from materials recycled from the medical waste stream. The target market is represented by 5 sources of revenue:

- Flexible Cushion Tiles, wholesale and direct retail sales, are currently the primary revenue source. Sales to support production operation at 3-shifts 5 days per week in 2000, with an additional production day per week in 2001, then maintain through 2004.
- Cylinder Molds & lids with custom labeling. Sales growth to sustained 2-shift production in 2000 with 3rd shift added in 2001 and maintained at that level for subsequent years.
- Disinfection of medical wastes at 130,000 pounds per month in 2000 with growth to 520,000 pounds per month in 2004.
- Resin sales from reclaiming medical wastes equivalent to 50% of poundage processed through disinfection services.
- Mail-In-Sharps program begins in 2000 with full capability ramp up over next 5 years. Revenue currently undefined but is expected to exceed mobile disinfection revenue.

Operations:

Operations cover all aspects of administration, managing and operating Genesis Manufacturing facilities.

- Expand existing facility space to maximize workflow and injection molding efficiencies while at the same time providing adequate space for receiving, warehousing and processing incoming materials.
- Develop new facilities and trucking capacity to support 1 disinfection operation in 2000 with expansion to 7 mobile disinfection units by in 2004. May include separate material receiving, washing and granulating facility that feeds the injection molding operations and sale of reclaimed resin.
- Develop staffing to manage and operate multi-shift operations while minimizing overhead costs.

Personal:

Realize business dream while reclaiming some of

CONCLUSIONS

1. Fiscal Year 2000 is a very critical year for Genesis Manufacturing. Significant product diversification and revenue growth to yield positive profitability is essential otherwise it is unlikely the company can survive without substantial cash infusion in the short term. Long term, retained earnings from operations must be approximately 7% to sustain planned growth.
2. Jeff is on the right track for growth and product diversification but is likely to need some assistance in keeping existing production operating at 2 full shifts while developing and implementing new product production capabilities and increased sales volume for current product lines.
3. Genesis Manufacturing has an excellent understanding and assignment of production process costs but is aware that current-pricing practices does not incorporate some factory overhead and no general overhead costs.
4. Sales to Turtle Plastics are and will continue to be a net loss at current pricing levels. Direct sales of Cushion Tiles at proposed prices will contribute to cover overhead costs although there will be ~6.6% net loss overall for flexible tiles. Profitability from this product line could be improved from a combination of price adjustments and three shift production, assuming that supporting sales volume can be achieved.
5. Cylinder Molds can be profitable at current pricing levels but only at a minimum 2 full shift production with corresponding supporting sales volume.
6. Market competition from existing products or suppliers tends to place a ceiling on product

pricing options for equivalent products. Therefore, products manufactured from recycled plastics must offer a performance advantage to justify higher prices or sales and production volume must be sufficiently high in a diversified product mix to offset business overhead costs.

7. Fifty percent of FY 2000 revenue and 70% of FY 2001 revenue needs to come from "New Products" with a high net profit to support both sales and profitability goals as well as help assure long-term business viability.
8. FY 2002 is the projected transition time frame from survival mode to sustainable growth. Consistent profitability and value-added return to investors assume that business growth follows the path outlined in this report.

CRITICAL SUCCESS FACTORS

Critical success factors are those few things the business must absolutely and successfully address or there is a strong probability that the company cannot achieve its long-term objectives.

1. Substantially increase marketing and sales to sustain minimum 2-shifts, 5 days per week production volume for Cushion Tiles and Cylinder Molds is critical. Three shifts operation is even better.
2. High profit margin new products or services must be brought on line during 2000. Minimum sales of $600,000 with 24% retained earnings from new products and services represents 50% of sales and well over 100% of the net profit.
3. Retained profitability of 3.75% for 2000 and 7% in subsequent years is crucial to sustain long-term business growth and viability.
4. Existing facility floor space must be expanded along with increased cooling tower capacity to support continuous multi-shift injection molding operation.
5. Additional facilities and assets must be put in place to support the disinfection and medical waste reclamation business.

RECOMMENDATIONS SUMMARY

Recommendations are presented in priority order for focused implementation actions. The first set of recommendations tends to take priority over the next set but in practice several recommended actions could be carried out simultaneously.

Priorities were established by assessing which actions provide the most immediate benefit or are necessary to enable the next set of recommended actions. These actions should be incorporated into a written Business Plan including supporting Strategic and Marketing Plan to guide all employees in supporting the business growth goals. A summary listing is provided below and followed on subsequent pages with a more detailed presentation and discussion.

Market:

- The first market actions need to focus on generating much ***higher Cylinder Mold sales*** equivalent to full 2-shift production plus at least ½ shift direct sales for Turtle Tiles.
- ***Greater emphasis on direct sales*** could turn a losing product line into a profitable one. Renegotiate Turtle Plastics pricing to a level consistent with $0.82 unit cost at 2-shift production fully loaded with appropriate factory and general overhead expenses. Pricing should consider that some overhead included in the cost comes from idle injection mold equipment that could be used to generate additional revenue. Wholesale pricing around $0.59 to $0.62 unit price is approximately equal to direct material and process costs of $0.596 each. Direct sales pricing scenarios cover processing costs plus contributes to help cover overhead costs.
- ***Target sales for 2000 at $1.2 million*** with 50% coming from new products and services such as Mobile Disinfection, reclaimed resin sales and Mail-In-Sharps program. Retained profit from

new products and services should be ~24% of sales in order to cover overhead costs and losses from current product lines sales.

- ***Hire or contract with an individual to focus on increasing current product line sales*** to free Jeff's time to develop new product line revenue streams.

Business Growth:

- ***Increase sales*** to $1.2 million in 2000 with goal to achieve $2.6 million in 2004. Pricing and product mix goal should be set at 3.75% retained profit in 2000 and 7% for each subsequent year.
- Improve contribution from 50% of sales generated by new products & services in 2000 to more than 75% in 2004.
- ***Manage gross margin*** to ~32% of sales and reduce general and administration expenses including interest to 28% of sales in 2000 & 2001 with further improvement to 25% for subsequent years.
- Use retained profits to fund assets needed to support revenue growth while solidifying financial strength by ***reducing interest bearing debt*** as a % of capital structure from 189% in 1999 to 33% in 2004.

Operations:

- ***Hire*** an individual that has the skills or potential to serve as ***an operations manager*** that can relieve Jeff of current manufacturing activities. Also plan for development of individuals that can act as ***team leaders*** for 2nd and 3rd shift operations.
- ***Develop a plan for*** production and supervisory ***personnel additions*** required for production as well as marketing and sales. Plan on total headcount over the next 5 years to range between 19 and 32 depending on process improvements and type of assets purchased.
- ***Improve Cushion Tile process costs*** through process improvements in history jacket snap removal.
- ***Manage working capital performance*** improvement from a negative 18% of sales to ~0.2% in 2000 with gradual improvement to ~4% in 2001, >4.5% in 2002, ~7.4% in 2003 and approaching 9% in 2004.
- ***Manage total inventory*** at 30 days of sales or less. Incoming material is a primary factor that drives facility floor space requirements so a minimal amount necessary to support multi-shift injection molding capacity is essential to avoid shut down due to material short fall within floor space limitations.
- ***Maintain*** current practice in ***Accounts Receivable*** at 18 days of sales tied up in receivables.
- ***Improve*** profitability to enable ***Accounts Payable*** improvement from 132 days of cost of sales in 1999 to 35 days in 2000 with further improvement to 30 days in all subsequent years.
- ***Manage cash on hand*** equivalent to approximately 8 days of sales. This is an improvement from negative 11.2 days of sales in 1999.
- ***Add assets to support business growth*** with a targeted level of investment that maintains the depreciated asset ratio at approximately 0.6. This is equivalent to 60% of fixed asset value that is depreciated as a business expense.
- For ***capacity planning***, a general guideline that should be followed is to plan 2nd shift output to be 80% of 1st shift and 3rd shift to be 65% of 1st shift output.

Personal:

- ***Seek out and hire at least 2 key individuals*** to support existing product sales & marketing activities and operations management to free up Jeff Steiner's time and energy to focus on business strategic and growth initiatives. This

Hi-Tek Rubber, Inc.

BUSINESS ASSESSMENT EXECUTIVE SUMMARY

This report section provides an overview of the assessed company and insight into the strategic direction expressed for the business. Business objectives are followed by conclusions derived from current observations and analysis of past performance. Comparison of goals versus capabilities and forecast results yields insight into the critical factors that must be addressed by management in order to achieve stated objectives. In some cases, the implied objective of long-term survival dictates near-term actions that may not be expressly stated by company ownership.

Recommended actions are intended to move the company toward stated objectives while improving financial performance to be equal or superior to the average company that competes in the same market segment. SIC code and other public data is used for comparative purposes since there is no specific reference data for recycling companies.

Disclaimer: Following recommended actions cannot guarantee success but rather serve to guide management around pitfalls that otherwise could lead to negative and possibly devastating results.

COMPANY PROFILE AND BACKGROUND

Hi-Tek Rubber, Inc. is a Minnesota "C" corporation, organized and incorporated June 1999. The company headquarters is currently located at 28433 Hwy 65 N.E. Isanti, MN with manufacturing occupying a former school building in Ogilvie, MN. Gordon Cell founded the company for the express purpose of manufacturing a rubber shingle replacement for slate and cedar shingles using recycled rubber from tires as one of the main ingredients. The company operates within the North American Industrial Classification System (NAICS) code 326200, which includes former SIC code 3069, footwear and rubber fabricated products.

The market for simulated slate and cedar shingles is high-end residential and commercial buildings. This niche market represents about 7% of the roofing industry. Initial information suggest that the market potential represents approximately $600 million annual sales. Capturing a small portion of this potential revenue assures Hi-Tek Rubber of a bright future assuming manufacturing costs can be managed to an appropriate level relative to product sales price.

Proof of concept was dramatically demonstrated by production of simulated slate shingles and installation on a house built in the late 1800's and located at 266 Summit Avenue, St. Paul, MN. The historical house is reviewed in the journal, American Society of Interior Designers, Showcase Home, May-June 2001 issue. The simulated slate shingles preserved the historical look while greatly reducing the difficulty and cost of installation compared to slate. Comments received from installers, insurance agencies and interested observers gave further impetus for development of capabilities for volume production of the rubber-based simulated slate shingle.

Company assets were initially acquired from CAMCO, a former manufacturer of rubber molded and rubber coated products. Hi-Tek Rubber capabilities are grounded in the expertise derived from the production rubber-molded products for agricultural equipment such as sugar beet harvesters. Additional production assets and molding process concepts have been secured to allow initial ramp up in production capacity. Full capacity will be developed as an ongoing expansion effort to fulfill demand in the niche market in which Hi-Tek Rubber will compete. A three-phase approach brings initial production on line in the 3rd quarter 2001, phase two automates key processes from phase 1 and expands milling capacity. The 3rd phase is expansion of

OWNER'S OBJECTIVES

The owner's objectives for the business can be classified under the categories: Business Growth, Market, Operations and occasionally Personal. Goals were derived from the assessment interview process as well as from financial statements, planning documents and other information provided by company management.

Operations:

Operations cover all aspects of administration, managing and operating the manufacturing facilities.

1. Fully utilize production potential at Olgivie, MN plant with addition of presses and milling capacity as determined by facility floor space.
2. Use contract labor in the near term to fulfill 3 shift, 5 day work week operations.
3. Maintain management and administrative personnel at FY2001 levels through FY2002 then add minimal staff to achieve low SG&A overhead rate.
4. Expand operations to other strategic locations where material processing and production capabilities are co-located to the greatest extent possible.

Market:

1. Achieve 5% to 10% share of niche market for simulated slate and simulated cedar shake shingles in the next 5 years.
2. Pricing for simulated slate shingle targeted for $280 per square (100 square foot coverage).

Business Growth:

1. 100% annual revenue growth achieving $17 million sales within three years.
2. Pretax profit of 30%.
3. Utilize investors and founder financing to cover operating capital needs through FY2002 then uses retained earnings and minimal debt to finance

CONCLUSIONS

1. Simulated slate shingle market potential appears real and volume production is viable.
2. $280 / square price and 30% pretax profit ***goals are incompatible*** and not achievable with proposed production technology.
3. Volume production with pricing at $320 per square generating ***10% to 11% pretax profit is reasonable.*** FY2001 production volume must be 4,700 squares at $457 per square to generate same profit level. Pricing does not address distributor mark-up requirements.
4. Ogilvie production facility will run ***out of space by year-end 2002.*** Further growth requires another facility with co-location of material processing, milling and production operations to the maximum extent possible.
5. ***Prior year financial statements need to be restated*** consistent with the reclassification of certain accounts that bring statements more in line with industry practices.

CRITICAL SUCCESS FACTORS

Critical success factors are those few things the business must absolutely and successfully address or there is a strong probability that the company cannot achieve its long-term objectives.

1. Establish full 3-shift capability for #9 press and at least 3 Argos presses equivalent to 6 months and 4 months operation respectively in FY2001.
2. Obtain business funding totaling $845,000 in FY2001 and approximately $1.77 million in FY2002 to support asset growth and operating capital needs assuming retained earnings provide approximately $320,000 net contribution during this period.

RECOMMENDATIONS SUMMARY

Recommendations are presented in priority order for focused implementation actions. The first set of recommendations tends to take priority over the next set but in practice several recommended actions could be carried out simultaneously.

The priorities were established by assessing which actions provide the most immediate benefit or are necessary to enable the next set of recommended actions. These actions should be incorporated into a written Business Plan including supporting Strategic and Marketing Plan to guide all employees in accomplishing the business growth goals. A summary listing is provided below and followed on subsequent pages with a more detailed presentation and discussion.

Company priorities are Operations driven first followed by Market then Business Growth. This priority order represents actions that proves initial production capability and sets the stage for profit generation that is key to attracting further investment and financial aid to fuel business growth.

Operations:

- ***Aggressively push implementation*** of multi-platen presses to minimally achieve 3 shift operation of the #9 press and at least 3 Argos presses by end of 3rd quarter FY2001.
- ***Plan for expanded milling capacity*** to be on line in 1st quarter FY2002 and four more Argos type presses by end of 2nd quarter FY2002. Plan should ***provide for automation*** of material movement and trim processes.
- Strategic planning should ***provide for additional facilities*** with co-location of material processing, milling and product production. Facilities need to accommodate ***25 to 30 presses*** and supporting processes within the next five years.
- Consider heat recapture from radiated energy generated by presses and reuse for either heating building or re-injection into the press heating system.

Market:

- Establish a ***time phased pricing schedule*** directed at specific customers consistent with manufacturing ability to deliver required product volume.
- Clearly define and establish a written market strategy that accommodates ***realistic pricing and profitability goals***. Include priorities for which customer group is to be targeted first.

Business Growth:

- ***Aggressively pursue equity funding and capital lease options*** to support FY2001 through FY2002 production ramp up to full production volume. Subsequently use minimal debt and, principally, retained earnings to fuel further growth. ***Document time-line*** for acquiring funding and implementing assets.
- ***Reexamine pretax profit goal*** to be consistent with product pricing and cost realities. 10% to 11% pretax is reasonable but still ***exceeds industry average*** pretax profit of 3.2%.

Phoenix Recycling Corporation

BUSINESS ASSESSMENT EXECUTIVE SUMMARY

This report section provides an overview of the assessed company and insight into the strategic direction expressed for the business. Business objectives are followed by conclusions derived from current observations and analysis of past performance. Comparison of goals versus capabilities and forecast results yields insight into the critical factors that must be addressed by management in order to achieve stated objectives. In some cases, the implied objective of long-term survival dictates near-term actions that may not be expressly stated by company ownership.

Recommended actions are intended to move the company toward stated objectives while improving financial performance to be equal or superior to the average company that competes in the same market segment. SIC code and other public company data is used for comparative purposes since there is no specific reference data for recycling companies.

Disclaimer: Following the recommended actions cannot guarantee success but rather serve to guide management around pitfalls that otherwise could lead to devastating results.

COMPANY PROFILE AND BACKGROUND

Phoenix Recycling Corp. is located at 2823 N. Fairview Ave. in Roseville, MN. Harry Blair III founded the company in 1989 for the express purpose of recycling plastic materials from the consumer curb-side collections and post-industrial waste stream. The company started with one grinder and one employee with a vision to fill a void in an undeveloped market. An extrusion line and wash line was added in 1992 to expand capabilities and capacity. In 1996, an automated sort line was added as the most recent business expansion. PET and HDPE with some HMWPE are the primary materials processed by Phoenix Recycling.

Mr. Blair has worked extensively with the Minnesota Office of Environmental Assistance and major waste collections companies to develop both a material source and customer base for processed plastic materials and recycling services provided by Phoenix Recycling. Brian Treakle joined the company in 1994 to handle accounting tasks and now serves as General Manager.

The company currently leases 42,000 square feet of manufacturing space including 1,100 square feet of administrative space. Major equipment includes an integrated sorting line with in-line grinding and baling equipment plus a large wash line and water reclamation system. Multi-shift operation is employed to maximize production efficiency and meet customer demands.

Products currently provided include resale of baled plastic materials, washed and unwashed flake HDPE & PET as well as pelletized HDPE. Special blending of recycled plastics is also provided to meet customer specifications.

OWNER'S OBJECTIVE

The owner's objectives for the business can be classified under the categories: Business Growth, Market, and Operations. Goals were derived from the assessment interview process as well as from financial statements, planning documents and other information provided by company management.

Business Growth:

- Business growth is viewed as an essential survival element. A value-added product is desired for the coming year with expansion of existing product group volume to more than double output over FY1999 levels.

- ***Increase sales*** to 60% over FY1999 in FY 2000. Then double FY 2000 sales by FY 2004.
- Forecast and recommended retained ***profitability grows to 10%*** over the next 5 years from a net loss in FY1999.
- Relocation of the business to a more economical and central location is a component of business growth strategy depending on introduction and nature of a new product line.
- New product line targeted to use up to 50% of Phoenix Recycling material output thus providing a buffer against market price fluctuations and constraints while increasing overall profitability.

Market:

- Market focus is and will continue to be on plastic resin reclamation services and supplying processed plastic resins recycled from the post consumer curbside and postindustrial waste stream.
- Primary customer base will continue to be blow molding, extruded products, and injection molding and carpet fiber companies.
- Continue focus on PET, HDPE and HMWPE plastic resins with expanded capability to deliver custom tailored resins meeting specific customer requirements.
- Expand from a regional company with addition of research and development capabilities beyond 5 years.

Operations:

Operations cover all aspects of administration, managing and operating Phoenix Recycling facilities.

- Invest in more productive assets to support a minimum 46% improved throughput as measured by reduced costs and increased product volume.
- Expand asset utilization to full third shift with addition of personnel as needed to maximize production output.
- Add bilingual staff to facilitate communications with a largely Hispanic production staff. Add one or more administrative staff to offload some of current tasks from Brian.
- Update offices and equipment with particular attention to environmental controls that eliminate humidity and consequent mold growth on walls, floor and ceiling particularly in the conference room.
- Rearrange existing facility space to achieve more optimum material and work flow.

CONCLUSIONS

1. Fiscal Year 2000 is a very critical year for Phoenix Recycling. Product diversification and significant revenue growth to yield positive profitability is essential otherwise it is highly unlikely the company can survive without substantial cash infusion in the short term. Failure to put in place solid plans to achieve the recommended growth will result in company failure and likely bankruptcy.
2. A negative Z Score for FY1999 indicates high probability of business failure. This metric is converted to a favorable 3.4 value by FY2004 assuming recommended growth and improvement is achieved.
3. Net profit losses exist for all product lines except the “sorted, grind & wash” products. The greatest loss occurs on the “brokered” and “sorted and baled” products with -164% and -174% respective losses for each.
4. Market competition tends to place a ceiling on product pricing options for equivalent products. The company is also squeezed from the supply side by competition and price demand for incoming material stock. Therefore, new product lines manufactured from recycled plastics processed by Phoenix Recycling must generate sufficient value added revenue to offset and stabilize the influence of market fluctuations.
5. Current floor space appears to be adequate to meet growth needs assuming 1999 product mix, a maximum of 7 days inventory held on hand and asset productivity increases to double 1999 output. Some bulk storage capability may be

required to handle temporary quantities of finished goods. Addition of a new product line or business activity cannot be handled within the current facility.

6. Phoenix Recycling must substantially improve asset productivity and throughput capability on the sort line, baling and grinding processes. This involves asset replacement and upgrades while minimizing additions to production staff.

7. Personnel growth can be expected to grow from 25 in 1999 to 62 in FY2004 with current level of asset productivity. Improved equipment throughput capability could minimize growth to only 31 employees while doubling production volume output.

8. Wage and salary increases account for the major contribution to cost of goods sold growth and consequent profit losses. Secondary factors are attributable to supplies and maintenance costs.

9. Improved environmental controls are necessary for both production and office areas. Substantial mold growth was observed in the office conference room, which likely represents an unhealthy work environment for administrative staff. Production air quality, while possibly not a breathing hazard due to air borne "paper" dust from grinding operations, is a fire hazard because of build up on machines as well as facility structural components.

10. Office computer equipment is outdated and needs to be upgraded in order to support more recent software releases.

CRITICAL SUCCESS FACTORS

Critical success factors are those few things the business must absolutely and successfully address or there is a strong probability that the company cannot achieve its long-term objectives.

1. 60% revenue increase over FY1999 and positive net profit must be achieved in FY2000 with doubling of revenue and growth to 10%-retained profit by FY2004 is absolutely essential.

2. Current liabilities represented as short-term notes payable must be reclassified to "Additional Paid in Capital" as a first step toward strengthening the company balance sheet.

3. Addition of a value added product line is critical to offsetting market pressures and price fluctuations that directly influence Phoenix Recycling's ability to be profitable.

4. "Brokered" materials product line must be eliminated or at least reduced to the point where it presents little impact on overall profitability. Conversion to a value added product line usage would be the best alternative.

5. Asset productivity, particularly in the sort line, baling and grinding processes, must be improved including replacement of inadequate equipment and expanding capacity in these areas.

RECOMMENDATIONS SUMMARY

Recommendations are presented in priority order for focused implementation actions. The first set of recommendations tends to take priority over the next set but in practice several recommended actions could be carried out simultaneously.

The priorities were established by assessing which actions provide the most immediate benefit or are necessary to enable the next set of recommended actions. These actions should be incorporated into a written Business Plan including supporting Strategic and Marketing Plan to guide all employees in supporting the business growth goals. A summary listing is provided below and followed on subsequent pages with a more detailed presentation and discussion.

Phoenix Recycling priorities are arguably Market driven first followed by Business Growth then

Operations. This priority order represents actions that lead from the least to the greatest requirement for financial investment.

Market:

- The first market actions need to ***focus on deriving positive profit levels*** from all product lines while investigating development of a value-added product line. "Brokered" materials is not profitable under any current scenario and either needs to be eliminated, or increase sales prices to at least double current levels or converted to a value-added product line.
- ***Increase sale prices*** on all other product categories by 10% to 100% with concurrent improvement in operating efficiencies.
- ***Target sales for FY2000 at 60%*** over 1999 sales. Then double FY 2000 sales in FY 2004 with pricing consistent with generating improvement to 10% retained profit in the same time frame.

Business Growth:

- ***Increase sales*** to 60% over FY1999 in FY2000 with goal to then double FY2000 sales in FY2004. Pricing and product mix goal should be set at 1.6%-retained profit in 2000 with growth to 10% in FY2004.
- ***Capital restructuring*** is required beginning with reclassifying current liability short-term notes to additional paid in capital.
- ***Manage gross margin*** to ~ 15% in FY2000 with improvement to 20% in FY2004.
- Use ***retained profits*** to provide working capital and fund asset improvement or replacement needed to support revenue growth while solidifying financial strength by reducing debt and improving owners' equity.

Operations:

- ***Manage working capital performance*** improvement from a negative 79% of sales to approximately 8.4% in FY2004. Working capital components to be addressed are as follows: ***Manage total inventory*** at 7 days of sales or less. ***Improve Accounts Receivable*** from 35 days of sales tied up in receivables to ~30 days. ***Improve*** profitability to enable ***Accounts Payable*** improvement from 97 days of cost of sales in 1999 to 31 days in 2000 with further improvement to 24 days in FY2004. ***Manage cash on hand*** equivalent to approximately 8 days of sales.
- ***Add assets and minimal personnel to support business growth*** with a targeted level of investment that maintains annual depreciation at approximately current levels. Specific assets that need at least 46% throughput and efficiency improvement are baling, sorting and grinding operations. Plan for doubling total material processed over the next 5 years.

Pike Companies (Nylon Board Manufacturing, Inc.)

BUSINESS ASSESSMENT EXECUTIVE SUMMARY

This report section provides an overview of the assessed company and insight into the strategic direction expressed for the business. Business objectives are followed by conclusions derived from current observations and analysis of past performance. Comparison of goals versus capabilities and forecast results yields insight into the critical factors that must be addressed by management in order to achieve stated objectives. In some cases, the implied objective of long-term survival dictates near-term actions that may not be expressly stated by company ownership.

Recommended actions are intended to move the company toward stated objectives while improving financial performance to be equal or superior to the average company that competes in the same market segment. SIC code and other public data is used for comparative purposes since there is no specific reference data for recycling companies.

Disclaimer: Following recommended actions cannot guarantee success but rather serve to guide management around pitfalls that otherwise could lead to negative and possibly devastating results.

COMPANY PROFILE AND

Pike Companies, Inc. was founded as a Minnesota subchapter "S" corporation on May 9, 2000. The company evolved from Pike Construction, which has been in the building construction business for over 15 years. Subsequently, in September 2001, Nylon Board Manufacturing was formed as a division of Pike Companies. Mark Pike is the sole owner, President and CEO and Timothy Erickson is the senior manager. This business assessment report specifically focuses on the Nylon Board Manufacturing division although the text and report title refers to Pike Companies. Background and other selected information are derived directly from the July 16, 2001 Pike Companies Inc. Business Plan.

Pike Companies' construction background provided insight into the weaknesses of many commonly used building materials. Many of these products are unsuitable for use in their current applications. A prime example is in the home siding industry, where wood, Masonite, and composite siding proved to be unsuitable materials. These products have been replaced by more durable, water-resistant materials like vinyl and steel siding. This change in materials also occurred in the window industry, where wood exterior frames have been replaced by vinyl, aluminum, and steel. For years there have been similar problems with the sheeting materials used in outdoor advertising, boat construction, R/V's, trailers, and home construction. In fact, many of these industries periodically replace weather-damaged sheeting with the same material because there is no alternative.

Pike Companies, Inc. has found a better solution. Company focus is on providing a long-lasting alternative for plywood, green-treated plywood, and Oriented Strand Board (OSB). When exposed to moisture, these products swell, rot, and deteriorate. Further, these products are subject to termites, carpenter ants, and rodent damage. The new product will have the same workability as the wood products, but will be waterproof, insect-proof, and impervious to rodents.

The company has developed a unique method for recycling nylon carpet from both post-consumer and post-industrial sources into a variety of sheet products suitable as a replacement for plywood, OSB and other construction applications served by these other materials. Initial markets for the sheet product include advertising billboards, trucking bed sheeting, R/V construction and marine plywood replacement applications.

Development on the equipment and processes to produce the new materials has been under way since mid-2000. Production equipment has been fabricated and is now in place at the manufacturing facility located at 7832 21st Avenue NW, Medford, MN 55049. Initial test run and proofing of the equipment is expected to take place over the next several weeks (through December 2001) with the expectation that

initial production quantities of ½ inch 4 ft by 8 ft sheets will be available in the first quarter of 2002.

Nylon Board Manufacturing is a start up company that has yet to produce and sell its first product. As such, the conclusions, recommendations, forecasts and projections are based on comparative industry performance and best estimates of company processes and equipment capabilities.

OWNER'S OBJECTIVES

The owner's objectives for the business can be classified under the categories: Business Growth, Market, Operations and occasionally Personal. Goals were derived from the assessment interview process as well as from financial statements, planning documents and other information provided by company management.

Operations:

Operations cover all aspects of administration, managing and operating the manufacturing facilities. Goals may also embody sub-goals or require additional definition as indicated by bulleted items within each enumerated goal.

- Recycle and use nylon type 6 from post consumer and post industrial carpet in production of 4 foot by 8 foot sheets as a replacement material for plywood in selected applications.
- Establish production capability to process 30,600,000 pounds annually of nylon carpet waste materials into specialty sheet products.
- Operate production six days per week, three shifts per day and 300 workdays per year.
- Manage accounts receivable and finished goods inventory at 30 days of sales each. Manage accounts payable at 30 days of cost of sales.

Market:

- Provide nylon sheet products to the specialty construction and manufacturing segments where water, rot and insect resistance is required and current plywood products do not adequately meet requirements.
- Initial sales to target outdoor advertising market segment using ½ inch 4x8-foot sheet product with a target weight of 50 pounds per sheet.
- Focus sales and marketing effort on large wholesale and manufacturing companies and avoid direct retail sales. Expand market to national presence.

Business Growth:

- Achieve $11 million sales within three years with projected 67% of sales in pretax earnings.
- Expand to strategically located facilities as opportunity arises.
- Use retained earnings to fuel further growth and avoid any significant long-term debt.

CONCLUSIONS

1. The highly automated production equipment has not been tested to determine actual output capacity. As such, achieving 30,600,000 pounds annual production level is probably not achievable with the current equipment. Production output is more likely to be approximately 23,300,000 pounds annually.
2. Primary unknown factor is actual processing equipment capacity and ability to consistently produced a sheet product at the desired weight and density. The first concern is whether bulky fiber material can be fed in consistently large enough quantities to uniformly maintain extruder throughput. The second concern is that feedstock consists of mixed polymers, adhesives and other materials, some of which will volatilize at the extrusion temperatures employed. This may cause product density and weight to vary considerably from sheet to sheet.
3. A target weight of 50 pounds for the ½ inch 4x8 foot sheet appears desirable but compared to a theoretical weight of 95 pounds for a "pure" nylon sheet, the target weight implies the presence of a very light material equivalent to approximately

47% porosity. It is possible that the first pass of carpet materials through extruder process will have to be pelletized, then the pellets fed back through the extruder with an additional "blowing agent step" to produce the actual sheet product at the desired weight and density. A second pass through the extrusion processes will add $0.05 to $0.15 cost per pound for material.

4. Product price point seems reasonable compared to marine plywood, oriented strand board and other competing plastic products.
5. Profit goal is unrealistic and should be reevaluated. Adjustments to material and labor costs made in the detail analysis reduced the profit level, the result was yet a very healthy 34% to 40% pretax profit. Selling, general and administrative expenses are extremely low (~5% of sales) compared to the average (~25%) in SIC code 3089, miscellaneous plastics manufacturing industry.
6. The company should be able to double revenue growth every two to three years assuming achievement of year 1 and 2 performance as defined by the adjusted plan presented in the detail discussion and that retained earnings are fully used

CRITICAL SUCCESS FACTORS

Critical success factors are those few things the business must absolutely and successfully address or there is a strong probability that the company cannot achieve its long-term objectives.

1. The obvious and most pressing factor is getting the production equipment fully operational then test both operational capacity and sheet product quality consistency.
2. Product quality requirements for each market segment may vary, which will drive changes in production process parameters.
3. Material supply and cost strategy is essential to assure minimal material on hand to meet production requirements without occupying excessive manufacturing floor space at reasonable cost.

RECOMMENDATIONS SUMMARY

Recommendations are presented in priority order for focused implementation actions. The first set of recommendations tends to take priority over the next set but in practice several recommended actions could be carried out simultaneously.

The priorities were established by assessing which actions provide the most immediate benefit or are necessary to enable the next set of recommended actions. These actions should be incorporated into a written Business Plan including supporting Strategic and Marketing Plan to guide all employees in accomplishing the business growth goals. A summary listing is provided below and followed on subsequent pages with a more detailed presentation and discussion.

Company priorities are Operations driven first followed by Market then Business Growth. For the most part, company owners recognize which actions must be addressed as is evident in stated goals. Therefore, many of the recommendations mirror company goals.

Operations:

- Push to get production equipment fully operational by year-end 2001 then test for full operational capacity and sheet product quality consistency.
- Refine and adjust material processing characteristics to produce sheet products that consistently meet each market segment quality requirements.
- Adjust personnel requirements to comply with 2,080 hours (or less) annually compared with planned 300 workdays at 8 hour per shift or 2,400 hours.
- Establish a material supply and cost strategy to

maintain minimal material on hand to meet production volume requirements without occupying excessive manufacturing floor space.

Market:

- Research and develop product quality requirements for each market segment, then provide to operations for optimizing production process parameters.
- Validate product demand in each target market and get written sales order commitments.

Business Growth:

- Use the "Adjusted Plan" projections presented in the assessment report detail to guide business growth and operations management initially then refine cost & expenses as operational capabilities are validated.
- Plan for doubling revenue growth every two to three years assuming achievement of projected

Recycled Plastics, Inc.

BUSINESS ASSESSMENT EXECUTIVE SUMMARY

This report section provides an overview of the assessed company and insight into the strategic direction expressed for the business. Business objectives are followed by conclusions derived from current observations and analysis of past performance. Comparison of goals versus capabilities and forecast results yields insight into the critical factors that must be addressed by management in order to achieve stated objectives. In some cases, the implied objective of long-term survival dictates near-term actions that may not be expressly stated by company ownership.

Recommended actions are intended to move the company toward stated objectives while improving financial performance to be equal or superior to the average company that competes in the same market segment. SIC code and other public company data is used for comparative purposes since there is no specific reference data for recycling companies.

Disclaimer: Following the recommended actions cannot guarantee success but rather serve to guide management around pitfalls that otherwise could lead to devastating results.

COMPANY PROFILE AND BACKGROUND

Recycled Plastics, Inc., (RPI) is a manufacturing company specializing in utilizing post consumer and post industrial waste plastic as the raw material feedstock for its finished product. These waste plastics are manufactured into high quality, high-density polyethylene 4' x 8' sheets of varying thickness, which are marketed and sold to commercial industries nationwide. Extruded sheet materials are cut and fabricated into value-added parts for the marine and recreational industries.

Recycled Plastics, Inc. is a Minnesota corporation, organized and incorporated July 5, 1991. The company is currently located at 609 County Road 82 NW in Garfield, Minnesota. Market planning, staffing, and operational planning was completed December 1992 and on January 5, 1993, the doors to the production facility were opened. Actual production of product and sales commenced in November 1993 following a 10-month process development effort.

The company has undergone major evolution changes since its inception. Steve Porter became involved as a passive minority owner in 1991 then took an active role when the company slid into financial despair. In 1994 he bought 70% of the company then in 2000 purchased the remaining shares. Continued growth depended on bringing in more management expertise therefore minority positions in the company were offered to Tom Schabel, Al Sholts and Brian Bloedorn. These individuals are executive management personnel with Alexandria Extrusion Company. This strategic alignment and ownership provides for key managerial expertise and for joint marketing opportunities with an established international manufacturing company.

This new management arrangement has been active, although not finalized, in developing strategic goals and planning for targeted marketing efforts. Planning efforts and goals developed are an integral part of this business assessment report.

OWNER'S OBJECTIVES

The owner's objectives for the business can be classified under the categories: Business Growth, Market, Personal and Operations. Goals were derived from the assessment interview process as well as from financial statements, planning documents and other information provided by company management.

Business Growth:

1. $1,000,000 in new sales by the end of 2001 for

total of approximately $2,000,000.

2. Continued aggressive growth (after 3 years) at 10-15% pre tax profitability.

Market:

1. Expand current market niche in value-added production of cut and assembled plastics parts for the marine and recreational vehicle industry.
2. Focus on expanding current customer sales first then expand to 23 specifically targeted customers where potential exists for profitable value-added production services. Longer-term market focus to include the furniture, house wares, agriculture and building supplies industries where desired profit potential exists.
3. Develop innovative leadership in utilizing recycled plastics material in new and better ways. In 3-5 years, establish national and international reputation for very efficiently utilizing waste material that can be recycled.
4. License or establish joint facilities in international arena when opportunity is financially feasible.

Operations:

Operations cover all aspects of administration, managing and operating the manufacturing facilities.

1. Be a highly efficient "cut" product shop with focus on Routing, Assembling, Thermoform and Fabricating processes. Potential new processes include casting and carpet board fabrication.
2. Put in place a budgeting process, particularly for R&D purposes and formalize business practices.
3. Selectively and cautiously add indirect personnel with potential to add plant manager, salesman and office manager after achieving $2 million in sales. Add direct personnel as needed to meet production demands consistent with increased sales.

CONCLUSIONS

1. Recycled Plastics Inc., has the potential for significant growth and profitability given that the focus is on using recycled plastic materials to produce value-added products. The company, by Steve's admission, had reached the limit that could be achieved without bringing in additional management and sales expertise. The skills and experience brought to bear on RPI by Tom Schabel, Al Sholts and Brian Bloedorn substantially enhances the company's potential for profitable growth.
2. The company currently has more than 70% of revenue coming from a single customer. This is a dangerous situation in that a downturn in business for this single customer could easily spell disaster for RPI. A year-end push for targeted and joint marketing actions with Alexandria Extrusion is an appropriate first step to correct this situation.
3. Current assets have the potential to more than double current revenue by employing multi-shift operation and more efficient utilization of resources. Current routing assets are used at less than one full shift operation.
4. Existing facilities are adequate for growth over the next year or two but then must be expanded to accommodate greater work volume.
5. Supply of recycled plastics, as a raw material at a competitive cost, is major concern given that there is market consolidation and loss of smaller suppliers. RPI uses either flaked or pelletized plastics as well as sheet stock. The value-added products are milled or cut from various thickness sheet stocks. Sheet stock is currently purchased but some consideration is being given to establishing an in-house sheet extrusion capability. Economic viability to bring this capability in-house at the volume of sheet stock consumed by RPI is a major concern.
6. RPI processes currently support a limited product mix with parts cut from sheet stock being the predominant revenue source. Compression molded sheet stock processing occupies a substantial amount of floor space but generates a small fraction of revenue. Actual product cost by major process is not well defined.
7. Company plans for revenue and profit growth are aggressive and require careful focus of management attention if there is any chance to achieve the goals as currently stated.

CRITICAL SUCCESS FACTORS

Critical success factors are those few things the business must absolutely and successfully address or there is a strong probability that the company cannot achieve its long-term objectives.

1. Diversification of customer base is the first critical action to relieve the risk associated with a single customer as the majority revenue source.
2. Developing a supplier base of competitively priced recycled plastics materials in both sheet stock and flaked or pellet form in the volumes to support the projected growth is a critical concern.
3. Workflow optimization and maximum utilization of assets on a multi-shift basis is the key to achieving maximum profitability. This obviously means attracting and retaining a work force capable of maintaining efficient production operations on a second and potentially third shift.
4. The aggressive goals require management to continually refine and revise business plans to focus actions only on those efforts that directly support the revenue and profitability growth goals.

RECOMMENDATIONS SUMMARY

Recommendations are presented in priority order for focused implementation actions. The first set of recommendations tends to take priority over the next set but in practice several recommended actions could be carried out simultaneously.

The priorities were established by assessing which actions provide the most immediate benefit or are necessary to enable the next set of recommended actions. These actions should be incorporated into a written Business Plan including supporting Strategic and Marketing Plan to guide all employees in accomplishing the business growth goals. A summary listing is provided below and followed on subsequent pages with a more detailed presentation and discussion.

Company priorities are Market driven first followed by Business Growth then Operations. This priority order represents actions that lead from the least to the greatest requirement for financial investment.

Market:

- Conduct in depth market research to determine the profit and revenue potential for value-added products produced from recycled plastics considering current and future RPI production capabilities.
- Selectively expand the customer base first in the current market segment of marine and recreational products where RPI can delivery value-added cut and formed parts.
- Focus with laser-like attention on seeking out those potential products and services for customers where a high operating profit can be generated. Simply obtaining work for the sake of keeping busy or generating some revenue is not adequate within the framework of the business goals.
- Continually track profitability by market segment and customer to assure marketing efforts are optimally charting a course that supports stated business goals.

Business Growth:

- Critically examine the revenue and particularly the profitability growth goals for a reality check. Can the goals be realistically achieved?
- Flesh out and communicate business plan and strategy so that all business personnel are clearly aware of company goals. Include a strategy for expanding into the national and international market segments targeted by RPI.
- Use detail financial forecast as guideline in establishing budgets as well as defining business investment priorities. (see also operations section)

Operations:

- Plan for multi-shift operation to maximize current asset utilization with growth to approximately 58 employees by FY2005.
- Develop a budget and assign management responsibility based on the forecast financial performance presented as part of this business assessment. Pay particular attention to managing working capital components such as inventory, cash, receivables and payables.
- Critically analyze and evaluate the cost contribution from every major production process to individual product line cost and profit. Selectively invest in assets to maximize throughput.
- Optimize production workflow in the current facility and minimize floor space assigned to the compression molding of sheet stock. Plan for expansion in FY2002 of floor space assigned to cut and formed products.

ATTACHMENT A: BUSINESS ASSESSMENT REPORT

Company Profile and Background

Conclusions

Recommendations (Prioritized)

Assessment Findings

Management

- Key Personnel
- Roles & Responsibilities

Market Plans

- Business Mix
- Forecast/Plans
- Assumptions

Observations & Employee Recommendations

Finances

- (Past 3 to 5 years, annual report & notes)
- Income Statement, Including detail:
- Balance Sheet, Including detail:
- Cash Statement (uses and sources of cash)
- Shareholder Equity

Processes For Office, Support & Manufacturing

- Safety
- Manufacturing Process, Paper Work, Information & Material flow
- Process Effectiveness
- Capacity (current and projected)

Facilities & Equipment

- Offices & Support Facilities
- Manufacturing
- Receiving & Shipping
- Warehouse & Storage
- Utilities & Service Requirements

Quality Control

- Incoming Materials
- In-process Controls
- Finished Goods

Management Systems

- Computer Hardware
- Software
- Communications & Support

Personnel Requirements

Training & Education

Sample of Written Work No. 3

Recycling Industry Benchmarking and Performance Measurement

January 2005

Prepared for: U.S. Environmental Protection Agency and the Minnesota Office of Environmental Assistance

Prepared by: AMPros Corporation

Included as Exhibit III to R. W. Beck's Proposal for:

California Integrated Waste Management Board Tire-Derived Product Business Assistance Program

Contract No. IWM05030

R·W·BECK

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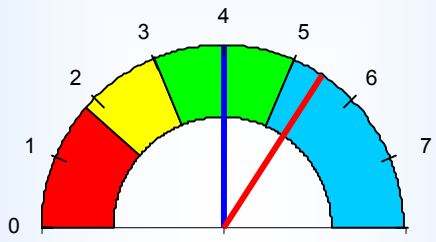
Final Report

Recycling Industry Benchmarking and Performance Measurement



Prepared for:

U.S. Environmental Protection Agency

Minnesota Office of Environmental Assistance

January 2005

Prepared by:

AMPros Corporation

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ACKNOWLEDGEMENTS

This project would not have been possible without the support of the many state, industry and federal agencies. Special thanks go to the following that provided moral support, advertising, funding and of course the all important company information.

- Wisconsin Department of Natural Resources, Bureau of Waste Management
- North Carolina Department of Environment and Natural Resources, North Carolina Recycling Business Assistance Center
- Illinois Department of Commerce and Economic Opportunity
- Minnesota Bankers Association
- Ohio Department of Natural Resources
- Institute of Scrap Recycling Industries
- Michigan Department of Environmental Quality, Environmental Science and Services Division
- Iowa Department of Natural Resources
- National Recycling Coalition
- Minnesota Office of Environmental Assistance
- U.S. Environmental Protection Agency, Region 5
- U.S. Recycling Economic Information study report, July 2001 by R.W. Beck, Inc.
- All the recycling companies that took the time and effort to provide their company information without which this benchmarking report could not have been accomplished.

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AMPros Corporation has prepared this report for the express use of the U.S. Environmental Protection agency and Minnesota Office of Environmental Assistance as well as participants in the recycling industry. The opinions expressed, conclusions and management guidance are those of AMPros Corporation. The information provided by companies and agencies participating in this study is believed accurate to the extent possible and as represented to AMPros Corporation. Recommendations, conclusions and guidance are presented on the basis of the information provided by participating companies and sources cited. Following the guidance provided may or may not improve individual business performance due to the many variables that contribute to business success that is beyond the scope and control of this report. There are no assurances that company actions based the recommendations will achieve the desired outcome and no warranties or other representations are presented or made.

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EXECUTIVE SUMMARY

Overview

The Recycling Industry Benchmarking and Performance Measurement project is a voluntary participatory effort designed to provide information beneficial to owners and managers of recycling companies. Risk and performance management information for recycling companies is not available making it difficult for companies to attract investors, secure loans and achieve profitable performance comparable to the best of companies in the recycling industry. MN, OH, MI, IL, IA, IN, WI, and recycling & banking associations supported the project with funding provided by the U.S. Environmental Protection Agency.

Various profitability, asset utilization, productivity and financial performance measures were benchmarked including quantities of material processed per employee, per asset, sales per pound, and many more indicators of business performance and management. Data is presented in tabular and graphical form as well as interpreted in narrative to give business owners direction on actions to improve their company returns on sales and resources.

Uses & Limitations

These benchmarking results are primarily for the benefit of recycling company managers and owners. It is a guide for assisting those individuals with responsibility for bottom line profitability, business growth and to improve financial and operating performance.

Lending institutions and investors have a set of benchmarks and performance measures to help in making informed decisions and mitigate risk yet facilitate further business investment in the recycling industry.

It also serves as a reference for government agencies responsible for promoting recycling businesses and market development. Many studies, surveys and reports have been generated on the economic benefits attributable to recycling efforts that accrue to communities such as employment, taxes and environmental improvement. Most previous reports are high level and suitable for overall economic planning but provide little guidance to the business owner. This report bridges the gap between economic planning and business realization of profits, asset utilization and resource management. Government and legislative bodies will gain a better understanding of what is required to support and promote success recycling business growth.

As in all recycling studies, there are limitations. The number of participating companies is small compared to the total number of companies involved in the recycling industry. A larger population of benchmarking companies would likely change the individual benchmark data. However, steps were taken to supplement participating company data with selected information from the U.S. Recycling Economic Information Study prepared by R.W. Beck, Inc., July 2001 as well as certain financial performance experience exhibited by a range of privately held and publicly traded companies. The combined data presents a solid baseline for sound business decisions, benchmark reference and performance measurement.

Summary of Results

Invitations were extended to over 1,500 recycling companies in Region 5 of the U.S. Environmental Protection Agency area encompassing Great Lakes area states plus Minnesota and Iowa. Ultimately, participation extended to include recycling facilities located in Kentucky, Missouri, and New York.

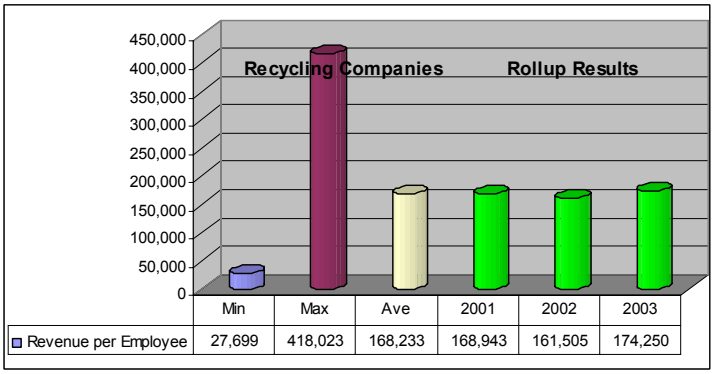
5.2% of companies indicated interest in participating in the benchmark activity but only about 1% actually followed through with data submittal. This is both good and bad news. Many expressed their desire to participate but indicated that business was booming and they didn't have time to pull together the necessary information. This is the good news; recycling activity was intensive and growing in 2004. The bad news being this, along with concern for data confidentiality, reduced the population of benchmarking companies.

Steps were taken to augment data submitted by the recycling companies resulting in a reasonable set of benchmarks for this first of a kind effort. The following paragraphs summarize significant results from each report section.

PRODUCTIVITY

Productivity bridges the gap between the U.S. Recycling Economic Information Study (REI report) and the current benchmarking effort. Information was derived from REI Appendix F and report body for comparison to productivity information obtained from the benchmarking company data. Information derived from the REI report included revenue per employee, receipts per pound of material processed, number of employees per establishment, material throughput per establishment and pounds of material processed per employee. The REI results do not reveal whether companies were profitable, capable of surviving or whether resources were adequate for growth.

The above REI productivity indicators are derived for companies participating in this benchmarking effort and expand to include information critical to successful business management. An example of productivity performance measurement is presented in the Revenue per Employee combination table and graphical display, Figure A. The graph illustrates recycling company minimum, maximum and average values plus "Rollup Results" for 2001, 2002 and 2003 while the table provides the actual numerical value. The "Rollup Results" is the data from all companies merged into a single "super" company yielding the "benchmark" result for the listed performance measure by fiscal year.



	Min	Max	Ave	2001	2002	2003
Revenue per Employee	27,699	418,023	168,233	168,943	161,505	174,250

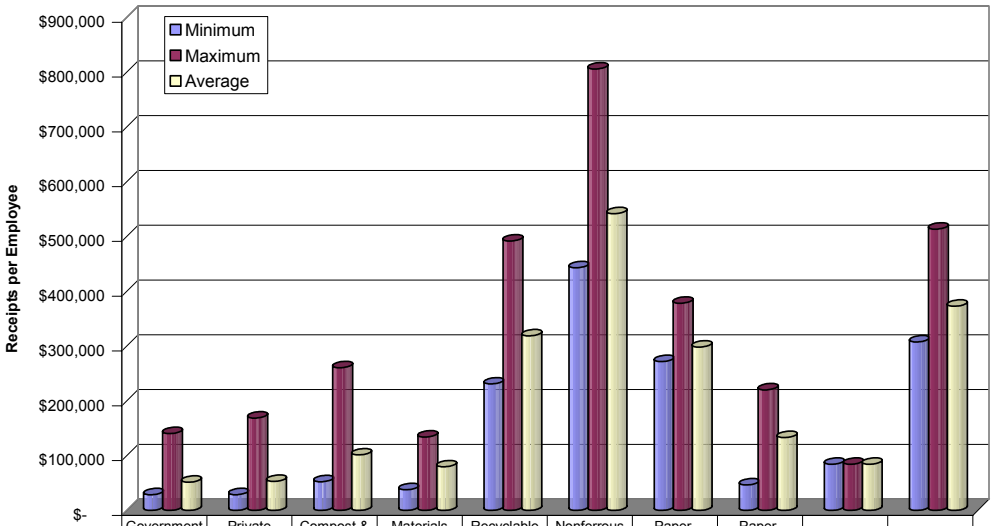
Figure A: Revenue per Employee

2003 benchmark for revenue per employee is $174,250. Note the range of experience from a minimum of $27,699 to a maximum of $418,023 and mathematical average of $168,233.

A second graph, Figure B, was derived from the REI report. The minimum, maximum and average values in both graphs represent the range of experience for participating companies in each report. REI performance information is further divided into categories of recycling industry. Only REI categories with companies 100% dependent on recycling were included in this report. All figures with "REI Industry Sector" associated with the title were derived from "The United States Recycling Economic Information Study", July 2002 commissioned by the National Recycling Coalition, performed by R.W. Beck and funded in part by the U.S. Environmental Agency.

Protection of confidential company data was paramount and the number of participating companies was too small to allow for similar breakout of benchmarks by industry category.

This graphical display of performance information is used throughout with



	Government Staffed Collection	Private Staffed Collection	Compost & Miscellaneous Organic	Materials Recovery Facilities	Recyclable Material Wholesalers	Nonferrous Secondary Smelting &	Paper, Paperboard and Deinked	Paper-Based Product	Plastics Reclaimers	Steel Mills
Minimum	$28,712	$28,775	$52,368	$37,831	$230,872	$443,125	$271,682	$46,616	$84,236	$307,556
Maximum	$140,333	$168,667	$260,506	$133,980	$491,921	$805,902	$378,273	$220,063	$84,245	$513,514
Average	$51,481	$53,109	$101,307	$79,582	$318,614	$541,841	$298,189	$133,007	$84,240	$372,723

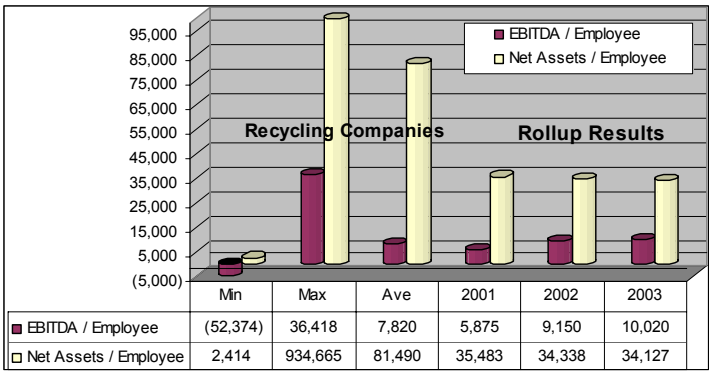
REI Industry Sector

Figure B: REI Receipts per Employee

comparable REI data provided where available. For example, other measures of productivity are profitability by employee and assets provided per employee that result in the sales per employee result, Figure C.

EBITDA per employee and Net Assets per Employee benchmark results are presented, Figure C, where EBITDA is earnings before interest, taxes, depreciation and amortization.

2003 benchmark for EBITDA per Employee is $10,020 and for Net Assets per Employee it is $34,127.



	Min	Max	Ave	2001	2002	2003
EBITDA / Employee	(52,374)	36,418	7,820	5,875	9,150	10,020
Net Assets / Employee	2,414	934,665	81,490	35,483	34,338	34,127

Figure C: EBITDA per Employee

The latter benchmark is an indication of the resources provided by company management to employees so that they may carry out the recycling processes and related business functions. EBITDA is often the preferred measure of profitability because it removes the distortion and differences in apparent profitability due to the variety of asset depreciation methods available to the business accountant. Many other measures of productivity and corresponding benchmark results are found in the Productivity report section.

SURVIVAL

Many companies that fail get into trouble before they realize it and often too late to take corrective action. Z-Score is widely regarded as a measure of a business ability to survive. Developed as a bankruptcy predictor in 1968 by Edward Altman, Z-Score is known to be approximately 90% accurate in predicting business failure within one year and about 80% accurate for two years in advance. Some practitioners use a general statement of 85% accuracy in predicting business failure. Many banking and lending institutions use Z-Score as part of their evaluation process to determine credit worthiness and risk assessment.

Probability for business failure is very high for Z-Score values of 1.8 or less. Z-Scores from 1.81 to 2.99 exhibit uncertainty as to failure or success. It depends on the make up the actual Z-Score and actions undertaken by the business to correct temporary deficiencies. A score over 3.0 generally signals that failure is unlikely. However, high Z-Scores are not necessarily predictive of success and must be viewed cautiously with particular attention paid to the make up of the score.

For companies in the benchmarking effort, 18% fell into the red zone representing potential failure within one to two years. 21% were in the yellow, cautionary zone. 15% were solidly in the "unlikely to fail" zone with scores above 3.0. Finally, 45% of the recycling companies exhibited some degree of superior performance with measures above 5. However, as noted above, high values do not guarantee success and could harbor elements of failure that are masked by high equity contributions to the Z-Score.

2003 benchmark for the combined set of recycling companies is 5.46, Figure D. Further discussion including contributions to Z-Score is provided in the Survivability report section.

No single measure should ever be used to judge the soundness of a business' situation. Use the benchmarks in combination to assess actual company performance and need for management corrective actions.

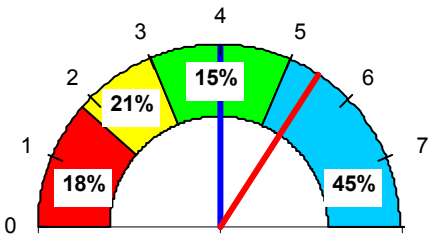


Figure D: Z-Score Performance

PERFORMANCE

Financial performance and benchmark results cover a large number of metrics ranging from profitability to asset performance, working capital management, cash management, and use of debt & equity to leverage business growth. One measure of profitability was presented above but many more exist and useful for focusing management attention of various components of the financial statement. Other common profitability measures are presented at right, Figure E, and discussed in further detail in the corresponding report section.

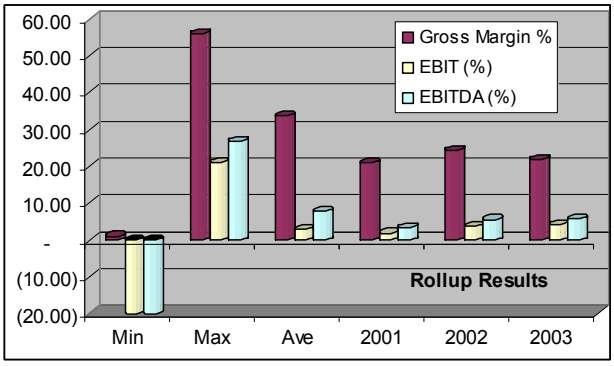


Figure E: Gross Margin %

One challenge developing these benchmark data were the different recycling business organization structures representing "C" corporations, sub-chapter "S", sole proprietor and various partnership types. There are many acceptable financial statement structures and ways of presenting company cost and expense account data.

Even companies carrying out identical processing activities and selling competing products and services may include costs and expenses in different financial statement categories. It was necessary to move some expense account information into cost of sales and other adjustments in order to obtain as comparable financial statements as possible. Failure to do so would have distorted certain important profitability and working capital benchmarks.

Most of the benchmark companies do not pay corporate taxes but instead pay a portion or all of net income to the business owners to cover personal tax liabilities and/or compensation. Payments to owners were treated as a "preference distribution" which is paid from net income leaving "Common Profitability". The latter being the monies available for paying dividends to common stock shareholders or for retained earnings. The following table, Figure F, presents profitability measures at various points in the income statement.

2003 Net Profitability % benchmark = 4.42 %.

Figure F: Profitability Table

Profitability	Min	Max	Ave	2001	2002	2003
Gross Margin %	1.16	56.01	33.59	20.98	24.41	21.95
EBIT (%)	(44.01)	21.07	2.87	1.91	3.68	4.20
EBITDA (%)	(44.01)	26.83	7.85	3.47	5.67	5.71
Net Operating Profit (%)	(44.01)	21.07	1.42	1.27	3.25	3.78
Income Before Taxes (%)	(43.27)	21.84	2.53	1.58	4.27	4.64
Net Profitability (%)	(43.27)	21.84	1.82	1.35	3.71	4.42
Common Profitability (%)	(43.27)	21.84	(1.71)	(0.35)	1.57	1.42

GROWTH

Company growth potential was evaluated based on earnings, equity and other factors in the "Growth" report section. These values are not accurate predictors to how much the company will grow but do provide a general sense of direction. A negative growth indicator signals trouble for the company, while values up to 10% reveal modest growth potential. Values from 10 to 30% represent excellent growth opportunities while higher values tend to become overly optimistic. **2003 benchmark for Potential Annual Growth Rate for the composite group of recycling companies is 28.9% based on adding preference distributions back to retained earnings.** ***An alternate calculation, and better indicator, showed growth potential of 4.64%*** when preference distributions and dividends are not added back to retained earnings. This latter calculation is more appropriate considering that many of the recycling companies make distributions to the owners to pay business and personnel tax obligations and/or owner compensation. In these cases, the distribution is not an option but rather an obligation of the business, which therefore reduces retained earnings that otherwise, could be used to fuel business growth. Increasing profitability and earnings retention improves growth potential.

VALUE CREATION

Economic Value Added is a measure of value creation that indicates how well company management is creating shareholder wealth through effective management of company resources. Certain outcomes from Economic Value Added calculation are presented without violating company data confidentiality. As a group the recycling companies demonstrate excellent value creation as indicated by the **2003 benchmark, Rate of Return on Beginning Capital = 25.5%.**

Another key measure presented is the Rate of Return Index, which is an indication of how well the company is doing in covering their cost of capital. There has been significant improvement since 2001 with a Rate of Return Index or 0.85. A value less than 1.0 indicates that the companies overall were not yielding sufficient returns on capital to pay for the cost of capital. **2003 benchmark for Rate of Return Index = 2.33,** an excellent performance result.

MILLION DOLLAR QUEST

Data confidentiality was an essential requirement for all participating companies. Yet providing only ratios, percentages and scores do not provide a visual perspective on the dollar make up of a benchmark financial statement. A "normalized" financial statement was prepared that provides for confidentiality yet also yields a visual representation of benchmark performance.

The normalized statement is based on $1,000,000 net revenue and a few other key adjustments to yield an Income Statement and Balance Sheet with dollar amounts shown for each summary account. In addition, most of the benchmark performance indicators discussed in the main report body are displayed in context to the statement dollar amounts. This permits a company to compare their performance on a $1,000,000 net revenue dollar basis as well as benchmark ratios and percentages then use the comparative results to plan for business improvement.

A preview of the improvement result is presented in Figure G with explanation of physical layout and content provided in the report body. Most accountants and financial professionals will recognize the following as an expanded DuPont chart method for presenting financial statement information and performance measures while technical personnel will understand the flow chart style presentation of the financial information.

The financial information is presented in flow chart format and summary accounting categories for the benefit of the non-financial manager and to focus attention on operational functions and related process changes needed to achieve desired performance improvement.

Projected Performance Improvement based on 2003 Benchmark Results. Negative values in "Other Cost of Sales", "Other Expense" and "Misc. Other (L) / G" in non-operating income show amount of improvement or change to be achieved in each Income Statement section to realize 6.6% net profit. 2003 benchmark for net profit was 4.4%. Note 34% provision for income taxes and preference distribution.

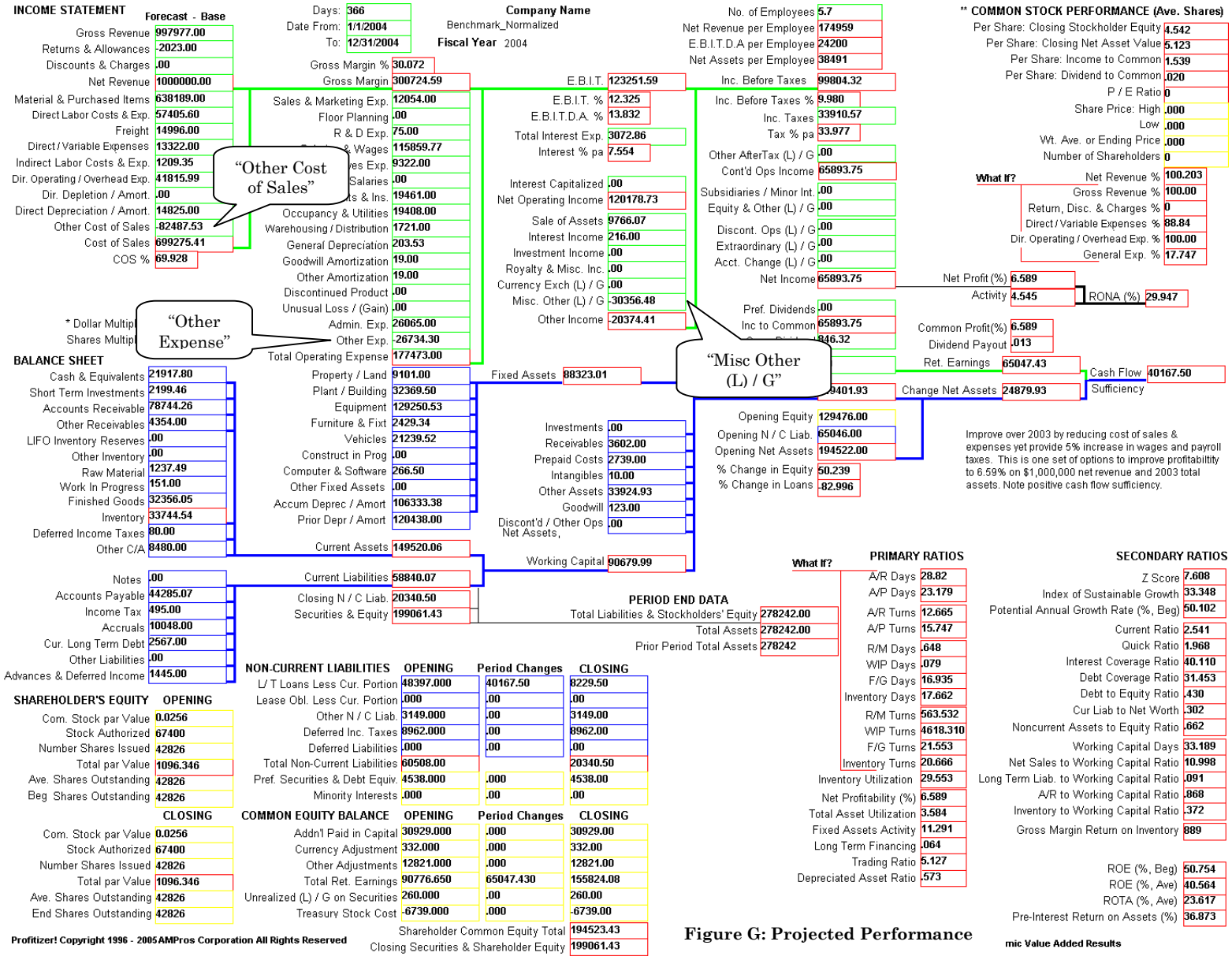


Figure G: Projected Performance

Improvement Tips & Strategies

Figure G presented one illustration for profit improvement but there are many strategies that could be employed to yield the same result. For example, one could reduce cost of sales, increase prices, eliminate unproductive assets, employ multiple shifts or minimize dividends and distributions. Figure H shows several scenarios for achieving profitability comparable to Figure G.

Account Category	2003 Benchmark	Scenario 1	Scenario 2	Scenario 3
Gross Revenue	$ 997,977.00	$ 997,977.00	$ 997,977.00	$ 997,977.00
Net Revenue	$ 1,000,000.00	$ 1,000,000.00	$ 1,116,488.00	$ 1,027,778.31
Cost of Sales	$ 780,493.00	$ 699,999.78	$ 781,541.60	$ 781,541.60
Gross Margin	$ 219,507.00	$ 300,000.22	$ 334,946.40	$ 246,236.71
Gross Margin %	21.95%	30.00%	30.00%	23.96%
Operating Expenses	$ 177,473.00	$ 177,473.00	$ 271,712.03	$ 183,002.34
EBIT	$ 42,034.00	$ 122,527.22	$ 63,234.37	$ 63,234.37
Other Income	$ 8,681.00	$ -49,310.78	$ 9,982.07	$ 9,982.07
Income B4 Taxes	$ 46,450.00	$69,675.00	$ 69,675.00	$ 69,675.00
Income Tax	$ 2,226.00	$ 3,339.00	$ 3,339.00	$ 3,339.00
Net Income	$ 44,224.00	$ 66,336.00	$ 66,336.00	$ 66,336.00
Net Income %	4.42%	6.63%	5.94%	6.45%
Pref. Distributions	$ 30,034.00	$ 30,034.00	$ 30,034.00	$ 30,034.00
Common Dividend	$ 568.00	$ 852.00	$ 852.00	$ 852.00
(Charges) Additions	$ -7,875.35	$ 0.00	$ 0.00	$ 0.00
Retained Earnings	$ 5,746.65	$ 35,450.00	$ 35,450.00	$ 35,450.00
Cash Flow Sufficiency	$ -13,746.47	$ 10,615.95	$ 10,615.95	$ 10,615.95

Figure H – Alternatives for Income Statement Profitability Improvement.

Scenario 1 held net revenue same as 2003 but reduced cost of sales to achieve 30% gross margin. Primary candidate for reduction is purchased materials & contract services, that is, the improvement is paid by suppliers of materials and services. Operating expenses is held constant and Other Income loss of $49,310.78 is allowed ultimately leading to net profit of 6.63% and positive cash flow sufficiency. The latter meaning the retained earnings was sufficient to pay for changes to assets plus allowed improvement in equity or provided opportunity for reduction in debt.

Scenario 2 achieved improvement through substantial pricing increases while hold cost of sales relatively constant to achieve 30% gross margin. Operating expenses could grow substantially while dependence on Other Income was dramatically reduced leading to the same profitability and cash flow sufficiency result as scenario 1.

Scenario 3 is a balanced approach with modest price increases while holding cost of sale constant resulting in approximately 24% gross margin. Operating expense grew slightly while Other Income is same as scenario 2 and achieves the same profit dollars and cash flow sufficiency result.

There are obviously many alternatives to improving profitability as shown in the income statement, but this is not sufficient to achieving overall operating and financial performance improvement. Key performance improvement tips are provided in Figure I and further noted where appropriate in the detailed discussion. Improvement in each of these primary ratios will lead to improvement in virtually all other performance measures and benchmarks discussed in this report. Note however, that these metrics influence one another

so changes in one will likely change results in another area and making it difficult to improve all performance areas at one time. An incremental improvement approach is recommended with focus on the priority order presented in the table below, Figure I.

Benchmark Metric	2003 Benchmark	Improvement Tips
Revenue Growth	21.63%	Higher is better. Use price increases, new product introduction or marketing campaign to increase sales while minimizing increase in cost of sales and expenses. Also minimize customer returns and discounts.
Net Profitability %	4.42%	Higher is better. Use price increases or market higher value products / services as first improvement option followed by cost of sales and operating expense reductions. Automate processes where feasible to reduce expense.
Asset Utilization	3.594	Higher is better. Increase sales using existing assets on multiple shifts, improve process efficiency or replace assets with higher productivity assets.
Accounts Receivable Days	28.82	Lower is better. Improve billings and collections process to reduce time to collect and/or amount of monies owed to the business.
Fixed Asset Activity Ratio	11.322	Higher is better but must consider degree to which asset is depreciated. Improvement is same as Asset Utilization above.
Net Sales to Working Capital	11.028	Higher is better. Improve sales for given level of working capital but watch for under-capitalization where working capital may be insufficient to support sales and customer demand.
Gross Margin%	21.95%	Higher is better. Manage by price increases, reduction in cost of goods or combination of the two. Improve throughput via automation if appropriate.
Inventory Days	17.66	Lower is better. Minimize level of inventory necessary to support sales while maximizing cash flow. High inventory ties up cash that may be needed otherwise to support near term obligations.
Accounts Payable Days	23.18	Higher is better. Maximize cash flow by paying to best terms allowed by suppliers and service providers without incurring adverse credit ratings. Balance rate for paying current obligations with earnings and accounts receivable days.
Total Operating Expense %	17.75%	Lower is better. Minimize but do not sacrifice personnel retention and quality of services necessary to support customer requirements.
Depreciated Asset Ratio	.603	Lower values reflect investments in newer assets and may be competitive advantage but be aware older, highly depreciated assets may be very productive. Use in conjunction with Fixed Asset Activity Ratio.
Long Term Financing Ratio	.466	Lower is better. Use debt to leverage growth where high sales and profit opportunity can be achieved with additional debt.
Trading Ratio	7.723	Higher is better but very high value may indicate insufficient equity to support sales. Increase sales as noted above. Increase profitability and retained earnings to improve equity and cash flow sufficiency.

Figure I – Improvement Strategies and Tips

Conclusions

Conclusions from the benchmark results are:

- The range of productivity experience for these companies mirrors the REI results and expands to bridge the gap from economic information to providing guidance for effective recycling company management and profitability.
- A standard definition of recycling firm types by industry sector should be adopted for all recycling companies and economic classification. There are considerable differences between states. This study started with the firm types used by Minnesota and several other states but the REI categories and industry sector definitions seem to be a better model and should be considered as the standard classification model.

- The combined result for all benchmarking companies as measured by Revenue per Employee was $174,250 which generated $10,020 EBITDA per Employee on $34,127 Net Assets per Employee. These are the minimal limits recycling companies should strive for while many companies exceeded these benchmark performances. Revenue, profitability and asset utilization performance was achieved on productivity benchmark for material processed per employee = 789,278 pounds annually.
- 18% of participating companies are in danger of failure within 2 years, 21% are in the cautionary zone while 45% demonstrated some level of superior performance as measured by Z-Score. Dramatic profitability improvement, asset utilization and cash flow management are the primary means for the troubled companies to move into long-term survival mode.
- Overall, the recycling industry demonstrates growth potential as measured by a potential annual growth rate of approximately 29% without consideration of preference distributions or 4.64% after distributions to owners for tax liability and compensation.
- Value creation for 2003 was excellent with a benchmark result of 25.5% return on beginning capital. This was a significant improvement over 9.4% in 2001.
- A normalized financial statement performance benchmark revealed that approximately 6 employees were required to generate $1,000,000 net revenue on $278,242 total assets.
- The recycling industry as measured by this limited benchmarking population is healthy but does contain a share of at risk companies. Guidance is provided for the poorly performing companies in pursuit of long-term profitability and survival. Superior performing companies will find useful information to strengthen and improve their profitability, growth potential, competitive position and market share.

Next Steps

As stated at the outset, the population of recycling companies participating in this benchmarking project was small but generated a much larger level of interest supporting the results expected to arise from the effort. Most companies expressed concern about releasing their confidential company information especially to the government but in general to any situation where they could not control data protection. This is understandable and has been the biggest barrier in the past to accomplishing benchmarking within recycling industry on a detail basis.

It is the sincere hope of AMPros Corporation that participating recycling companies will see their data was handled fairly and confidentially and that other recycling companies will feel comfortable with participating in a similar future benchmark effort.

The obvious next step is to solicit, encourage and expand benchmark participation. Developing a larger benchmarking population will enable breakout of benchmarks by recycling industry category. Sufficiently large number of participants would further enable benchmark development based on company size. This report represents a start in what is hopefully an ongoing effort to provide guidance for growing and improving recycling industry business performance and long-term survivability.

Report Organization

The report begins with an introduction and overview of data collection methodology and profile of company participation in the benchmarking process. This is followed by introduction to the REI study report and bridging the gap to the current benchmark report. The main body of the report follows the general order presented in the summary above but is also organized in order of business management priority. Managing to the benchmark performance measures in order of presentation and discussed improvement actions lead to "Other Returns", including Return on Net Assets and various Returns on Equity, results presented near the report end.

Finally, the Million-Dollar Quest presents contextual representation of financial results and most of the benchmarking data for 2001, 2002, 2003 plus a bonus illustration and one means of improving the 2003 benchmark performance.

INTRODUCTION

In June 2002, the Minnesota Office of Environmental Assistance (OEA) assessed business performance for six recycling companies in the Minnesota. The assessments focused on the companies' goals, markets, potential markets, and operations, as well as finances. Participation was voluntary and the assessments were designed to provide the companies with useful information for improving and planning. Most participants were very satisfied with the results and found the information invaluable.

A major finding from this study was the need to have financial and economic benchmark for recycling companies to judge how they are performing relative to peer businesses. Further, this information is important for business management to act in improving their operations and for government and other agencies to make informed policy decisions that assist the recycling industry.

In addition, investors typically seek to compare a company's financial data to an industry-specific financial performance standard for risk management purposes. The lack of this type of data for recycling companies can be a barrier for expansion of and improvements in recycling when investors are forced to fit them into other industry standards.

Consequently OEA initiated a recycling industry benchmarking and performance measure study with funding support provided by Region 5 U.S. Environmental Protection Agency. Further support and project endorsement was obtained from Minnesota Banking Association and agencies responsible for recycling endeavors in Iowa, Illinois, Wisconsin, Michigan, Ohio, Indiana and North Carolina.

AMPros Corporation was placed under contract to carry out the benchmarking tasks including data collection, analysis and report creation.

BENCHMARKING DATA COLLECTION PROCESS

Data collection began with OEA extending an invitation to individual state agencies and request for a listing of businesses involved in recycling activities within each state. AMPros Corporation processed the state agency recycling company list, eliminating duplicate entries and companies with incomplete information such as missing addresses. The initial composite list of over 3,000 contacts was narrowed to approximately 1,500. This seemed initially like an over whelming number to benchmark considering the allotted project funding and resource. Therefore, an initial company list was prepared by randomly selecting 50 recycling companies from each state for direct telephone contact and invitation to participate in this voluntary benchmarking effort.

The direct telephone call approach was abandoned after approximately 200 calls were placed with very limited success in reaching the intended contact. OEA and AMPros Corporation conferred on possible alternatives and decided on direct mailing an invitation along with a brochure describing the benchmarking project and a return postcard for recycling companies to express their level of participation interest. Appendix B presents the full packet of information mailed to the recycling companies. 1,531 invitations were sent by mail plus many more were delivered via e-mail in response to OEA posting the project description on their web site. The National Recycling Coalition also posted the project invitation on their web site in November 2004. Follow-up telephone calls and email was used to encourage participating and submitting company information. Up to 10 contact efforts per company were made to companies expressing interest, often without successful conclusion.

Data requested is presented in Appendix B along with a Q & A response to early questions about the project effort. Each company that agreed to provide all requested information was offered a brief assessment of their business performance in return for their participation.

PARTICIPATION RESPONSE

114 of the mailed invitations were undeliverable due to expiration of forwarding addresses or company was no longer in business. Overall, there was a 5.2% response to the mailing with 80 companies ultimately expressing interest in participating in the benchmarking effort. Many companies initially desiring to

participate dropped out for a variety of reasons. Foremost reason was reluctance to share company confidential information in spite of assurances that individual company data would not be revealed. Other individuals confided in telephone conversations that they would not participate in the project because they didn't want any help or involvement in an effort that involved the government. Finally, some 18 companies expressed strong desire to participate right up to the point of creating this report but indicated they were so busy with their business that they didn't have time to pull together requested information. There were other reasons expressed but confidentiality was the main concern. The final tally was that 15 companies provided some or all of requested information. All data provided is held in strict confidence by AMPros Corporation and only consolidated information is presented in this report.

STATE	Number Mailed	% Response
Iowa	293	2.39
Illinois	229	3.93
Ohio	269	5.20
Michigan	319	6.27
Minnesota	222	5.86
Missouri	1	100
Wisconsin	198	7.58
Total Mailed	**1,531**	**5.16 %**

Figure 1 – Participation Response by State.

The state by state response to the invitation letter is listed in Figure 1. Additional invitations issued in response to web site inquires are not included in the tabulation. Final submittal of requested information will not be revealed either by state or company name to protect the confidentiality agreement with all participating businesses.

RECYCLING BUSINESS PROFILE

A summary of company profiles is presented in the image below, Figure 2, for those submitting information for inclusion in the benchmark effort. Total number of participants was small but the cross-section of recycling industries represented was broad.

Additional information was obtained from the U.S Recycling Economic Information Study and derived from privately held and publicly traded businesses to augment information provided by the recycling benchmark companies.

Firm Type		**Material Category**	
Broker	X	Agricultural Products	
Manufacturer / End User	X	Bulbs, Lamps, Ballasts	X
Processor	X	Chemicals	X
Material Recovery or Recycling Facility	X	Computers & Other Electronic Appliances	X
Hauler	X	Construction & Demolition Debris	
Wholesale Distributor	X	Glass	X
Retail Distributor		Industrial Materials	X
Manufacturer Representative		Metals	X
Direct Consumer Sales		Miscellaneous	X
Other	X	Motor Vehicle Items	X
Facility Locations		Organic Materials & Wood Waste	X
Illinois	Missouri	Other Co-mingled Post Consumer	X
Iowa	New York	Household & Commercial Appliances / Vending	X
Kentucky	Ohio	Paper	X
Michigan	Wisconsin	Plastic and Rubber	X
Minnesota		Textiles and Leather	

Figure 2. Profile of participants by Firm Type, Location and Recyclable Materials.

RECYCLING ECONOMIC INFORMATION STUDY – 2001

National Recycling Coalition, Inc commissioned the U.S. Recycling Economic Information Study (REI report) with funding from the U.S Environmental Protection Agency. The study was carried out by R.W. Beck, Inc. and reported in July 2001. This was a nation wide study intended to document the economic impact from recycling for each of 26 categories of recycling and reuse establishments. The report was primarily aimed at economic development agencies, entrepreneurs, lawmakers and financiers as a reference and tool for understanding and promoting the recycling industry.

Data on number of recycling establishments, employment, annual payroll, annual receipts and annual throughput was developed for regions across the U.S. Direct participation was cited for California, Florida, Illinois, Indiana, Missouri, Nebraska, Northeast Recycling Council, Ohio and Iowa. The Northeast Recycling Council is comprised on 10 northeast states, 6 of which provided support to the REI study. These states were listed as Delaware, Massachusetts, New Jersey, New York, Pennsylvania and Vermont.

Data provided in the REI report is very useful at governmental and top level economic evaluation of the recycling industry but does not provide direct guidance useful to the individual business owner in managing for profitable returns and sustainable operations. Certain of the data can be related to the current benchmark project effort and is useful for setting context for both efforts. The reader is referred to the REI report for explanation of methodology used and discussion of results and data sources.

Specific REI data useful to the benchmarking effort include number of employees, materials processed, estimated receipts and throughput for each recycling category. Selected data was used to recalculate and derive pounds of material processed by employee, approximate receipt per pound, sales per employee and employees per establishment. These data serve as comparative benchmark to information provided via survey from recycling companies participating in the current effort.

A prime point, illustrated in the graph below, Figure 3, and in breakout versions in Appendix A, is that recycling is a volume driven industry with intense pressure on pricing and ability to generate sufficient profit to sustain and achieve economic growth. The REI study provides insight into the magnitude and economic opportunity for recycling but does not show whether the participants were profitable or provide other information essential to effective business management.

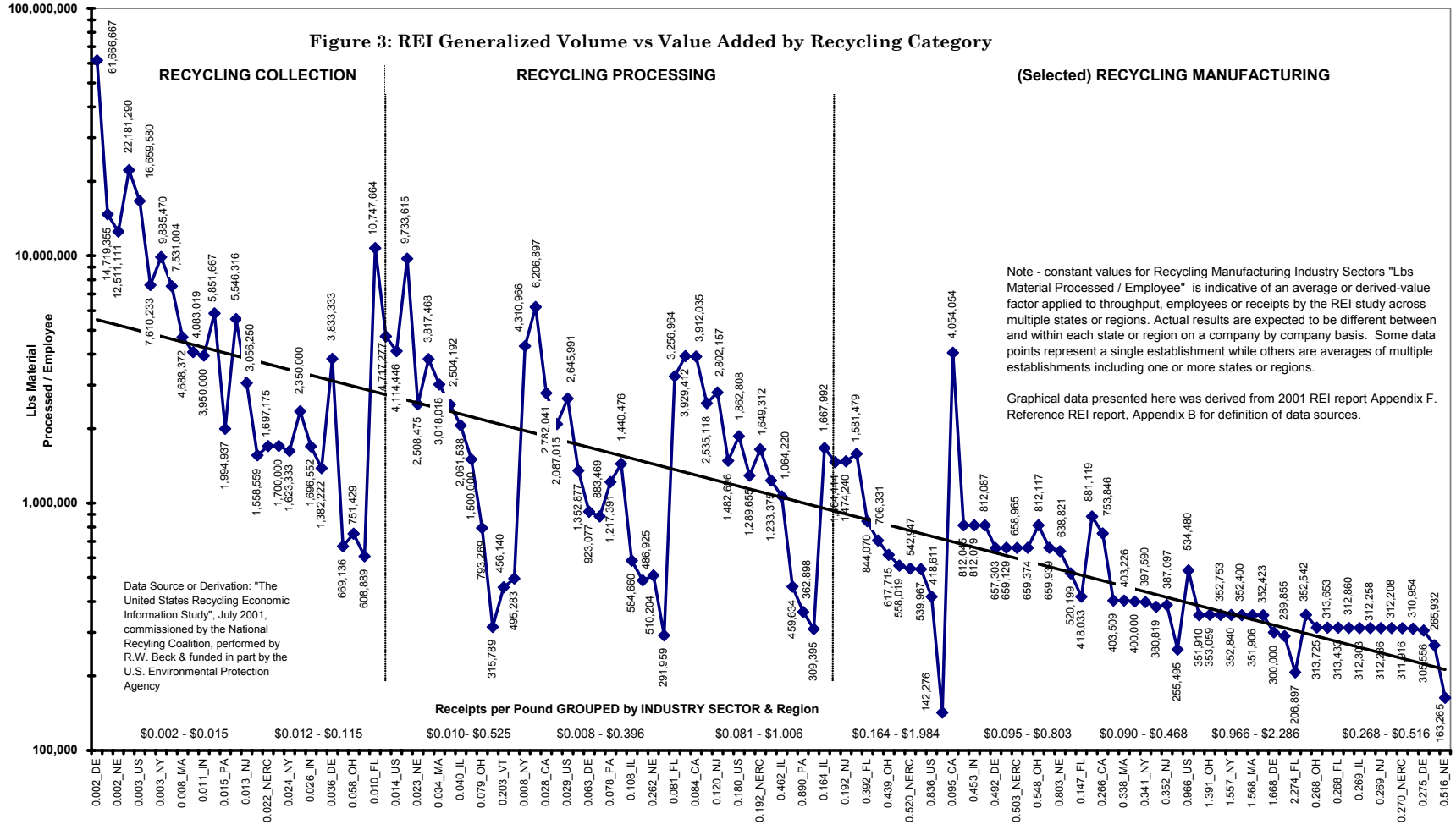
Appendix A also presents recycling category descriptions.

This benchmarking effort is designed to provide business owners' and managers with guidance as to key operating and financial performance measures they can use to maximize economic benefit. Banks, lending institutions and investors will find the benchmark information helpful in evaluating recycling company risk, performance and economic health. Selected information from the REI study will be used to place the current benchmark in context to the larger recycling industry picture.

SELECTED REI 2001 REPORT DATA

Selected data from the REI study is presented below showing the trend relationship between volume of material processed versus receipts realized from sale of services and/or recyclable materials. Information is presented on a per employee basis and per pound of material processed per employee. Three major categories of recycling activity are presented which are further broken down in the REI report into 26 industry sectors. Only sectors 100% dependent on recycling activities are included in the chart below and in subsequent benchmarking discussion.

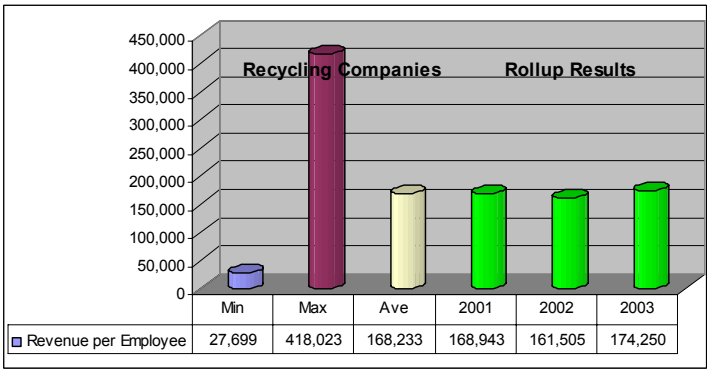
Note below the receipts per pound for each data point includes an extension that represents the state or regional source for the recycling data. Note also the volume versus unit sales receipt trend by recycling category and industry sector.



PRODUCTIVITY

Many factors go into defining productivity including both physical and financial aspects. Physical indicators of productivity include how much material an employee can process in a year, what assets were provided to the employee to process materials and how many employees did it take to process materials through the business.

Financial performance can be viewed from many perspectives such as what sales were generated per employee, per unit of material processed, per dollar of asset used and profit realized from employee actions. Productivity will be benchmarked first followed by numerous financial related performance measures.



	Min	Max	Ave	2001	2002	2003
Revenue per Employee	27,699	418,023	168,233	168,943	161,505	174,250

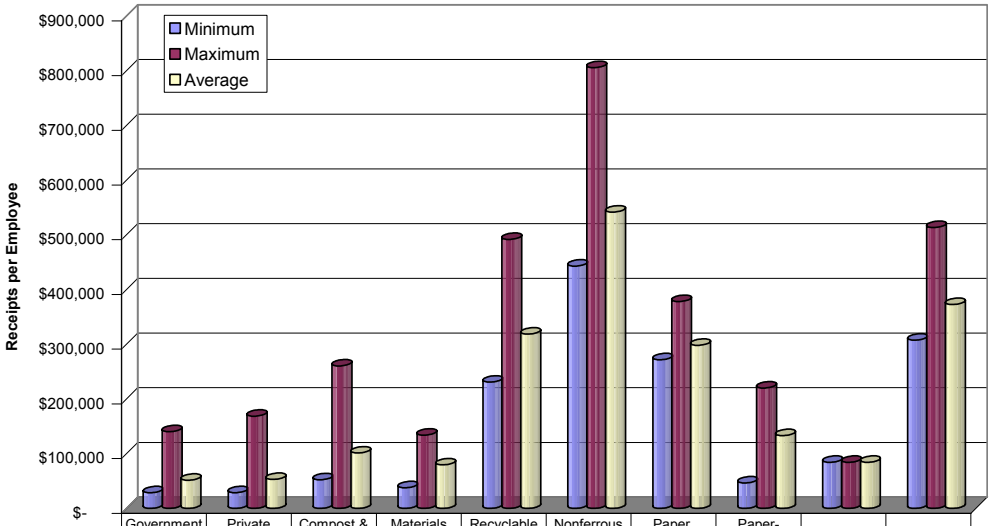
Figure 4: Revenue per Employee

In the above graph, Figure 3, higher value per pound of material is typically associated with lower material volume processed but is also related to intrinsic value of the recyclable material processed and establishment pricing strategy necessary to remain competitive in each respective industry segment. The result is realized revenue based on employee effort.

The top graph at right, Figure 4, presents Revenue per Employee generated by the efforts of the recycling companies participating in this benchmarking effort. Minimum, maximum and average values present the range of performance for the recycling companies. "Rollup Results" is the combined efforts for all participating companies and serves as the benchmark value. Rollup results are presented for 2001, 2002 and 2003. **2003 recycling company benchmark is $174,250 net revenue per employee** while the maximum was $418,023 and $27,699 for the minimum. Contrast these results to the REI study results by industry sector, Figure 5.

The REI Industry Sector graph was derived from data found in Appendix F of the REI study report. Only industry sectors are included where the businesses are essentially 100% dependent on recycling as the main business activity.

The benchmark group of companies represents a mix of industry sectors but is reported as a single group to protect their confidential business information. A larger number of participants could eventually lead to break out benchmarks for each industry sector and



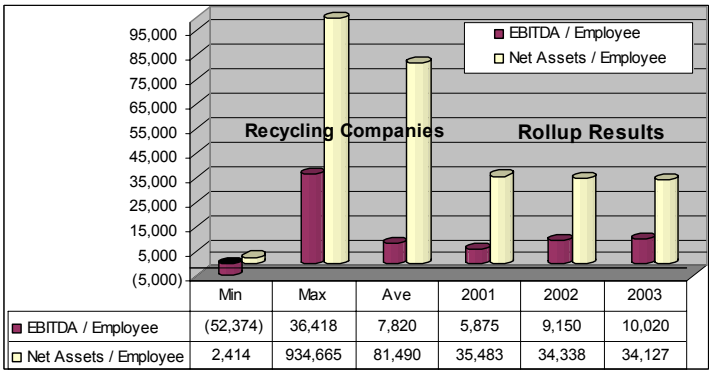
	Government Staffed Collection	Private Staffed Collection	Compost & Miscellaneous Organic	Materials Recovery Facilities	Recyclable Material Wholesalers	Nonferrous Secondary Smelting &	Paper, Paperboard and Deinked	Paper-Based Product	Plastics Reclaimers	Steel Mills
Minimum	$28,712	$28,775	$52,368	$37,831	$230,872	$443,125	$271,682	$46,616	$84,236	$307,556
Maximum	$140,333	$168,667	$260,506	$133,980	$491,921	$805,902	$378,273	$220,063	$84,245	$513,514
Average	$51,481	$53,109	$101,307	$79,582	$318,614	$541,841	$298,189	$133,007	$84,240	$372,723

REI Industry Sector

Figure 5: REI Receipts per Employee

potentially for varying business size. Use both the benchmark results from this current effort and the REI Industry Sector minimum, maximum and average for guidance in productivity measures.

Revenue per employee is a good start in measuring productivity but does not indicate whether the company made any money or what level of assets were required to achieve the reported revenue.

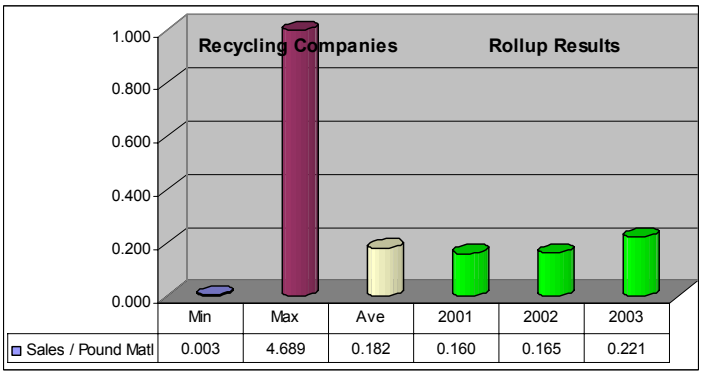


	Min	Max	Ave	2001	2002	2003
EBITDA / Employee	(52,374)	36,418	7,820	5,875	9,150	10,020
Net Assets / Employee	2,414	934,665	81,490	35,483	34,338	34,127

Figure 6: EBITDA per Employee

The EBITDA per Employee combination graph and table, Figure 6, presents insight to recycling company profitability and asset resources. EBITDA per Employee is a measure of profitability and Net Assets per Employee indicates the levels of assets provided employees to process recyclable materials and generate revenue.

EBITDA is earnings before interest, taxes, depreciation and amortization and is frequently identified as the best profitability indicator. The data suggests that **2003 benchmark of $10,020 EBITDA per Employee** was realized from 2003 benchmark of $174,520 net revenue per employee. The range however was from a loss of -$52,374 to a maximum profit of $36,418 EBITDA per employee. High levels of EBITDA per employee are desired but there are limits and trade-off with degree of automation and asset utilization.

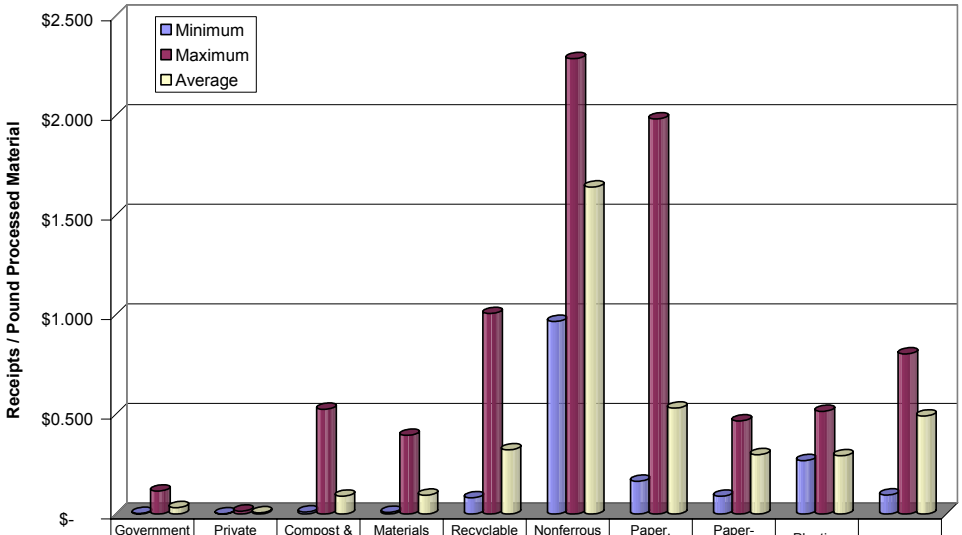


	Min	Max	Ave	2001	2002	2003
Sales / Pound Matl	0.003	4.689	0.182	0.160	0.165	0.221

Figure 7: Sales per Pound

Net Assets is defined as Total Assets less current liabilities in the Net Assets / Employee benchmark performance measure. Higher values for this measure generally indicate high degree of automation or dependence on expensive processing equipment. Lower values tend to suggest more labor-intensive operations. **2003 benchmark for recycling companies is $34,127** compared to a low of $2,414 and high of $934,665. This benchmark will vary dramatically by industry sector but data is not sufficient at this time to create individual sector benchmarks.

Another view into productivity as well as financial performance is presented by the Sales /



	Government Staffed Collection	Private Staffed Collection	Compost & Miscellaneous Organic	Materials Recovery Facilities	Recyclable Material Wholesalers	Nonferrous Secondary Smelting &	Paper, Paperboard and Deinked	Paper-Based Product	Plastics Reclaimers	Steel Mills
Minimum	$0.003	$0.001	$0.010	$0.009	$0.082	$0.967	$0.165	$0.090	$0.269	$0.096
Maximum	$0.116	$0.015	$0.526	$0.396	$1.007	$2.286	$1.984	$0.468	$0.516	$0.804
Average	$0.033	$0.006	$0.090	$0.094	$0.323	$1.641	$0.532	$0.298	$0.293	$0.492

REI Industry Sector

Figure 8: REI Receipts per Pound Material Processed

Pound of Material sold, Figure 7. Actual realization of revenue is dependent on the intrinsic value of the recyclable material, pricing strategy employed, market demands and constraints, regional variations in recycling infrastructure and business requirements for profit generations. Neither this benchmarking effort nor REI study address all these factors but Sales or Receipt per pound of material can be derived.

2003 benchmark for the current effort is $0.221 Net Sales per Pound material processed and sold. Minimum sales per pound of $0.003 per pound and maximum $4.689 reflect the range of intrinsic value for the recyclable materials.

REI Industry Sector, Figure 8, provides a range of values for each sector that should be used as an additional benchmark to that of the recycling company "Rollup Results". The range of REI Industry Sector Receipt per Pound of Material Processed is fully spanned by the current benchmark performance results. Use the REI Industry Sector data for guidance in comparing to individual sector performance.

Some companies expressed concern that they were small and won't compare to other recycling businesses. The fact is that most recycling companies are relatively small. The benchmarking data exhibited a range from the one-person operation to a maximum of 80 employees and an average of 19.8 full time equivalent employees. **The 2003 benchmark is 21.7 full time equivalent employees per business operation, Figure 9.**

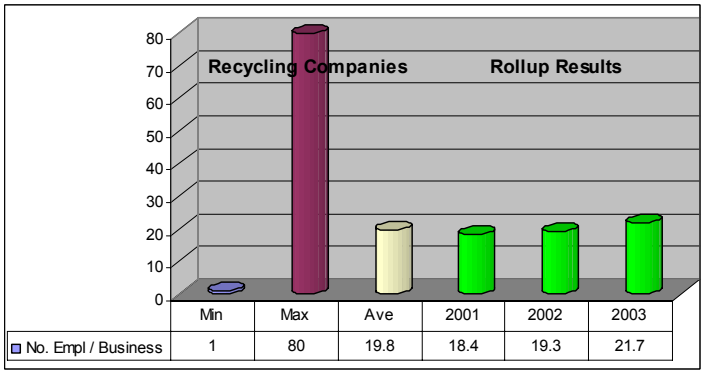


Figure 9: No. Employees per Establishment

Another perspective of business size is presented later in the "Million Dollar Quest" report section. A "normalized" result for realizing $1,000,000 net revenue is shown to require approximately 6 total employees.

The REI Industry Sector data presents further breakdown of employees per establishment, Figure 10. The minimum, maximum and average number of employees per establishment for all of the selected sectors falls within the range of this benchmarking effort except for steel mills and paper, paperboard and deinked businesses.

General trend for most industry sectors appears to be operations with an average employment of 5 to 50 employees. Minimum employment in most of the sectors shown is less than 10. From these data one concludes that the recycling industry in general is comprised of many smaller business operations.

Another business size related question is how much material do these recycling operations process?

REI Industry Sector study provides some insight through the data presented

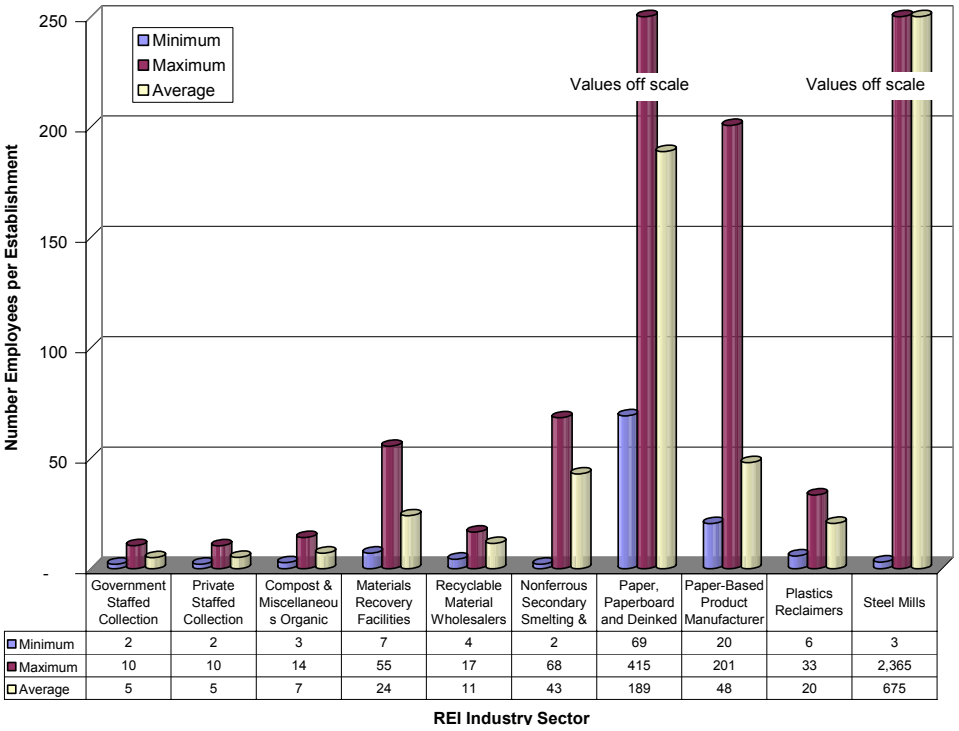
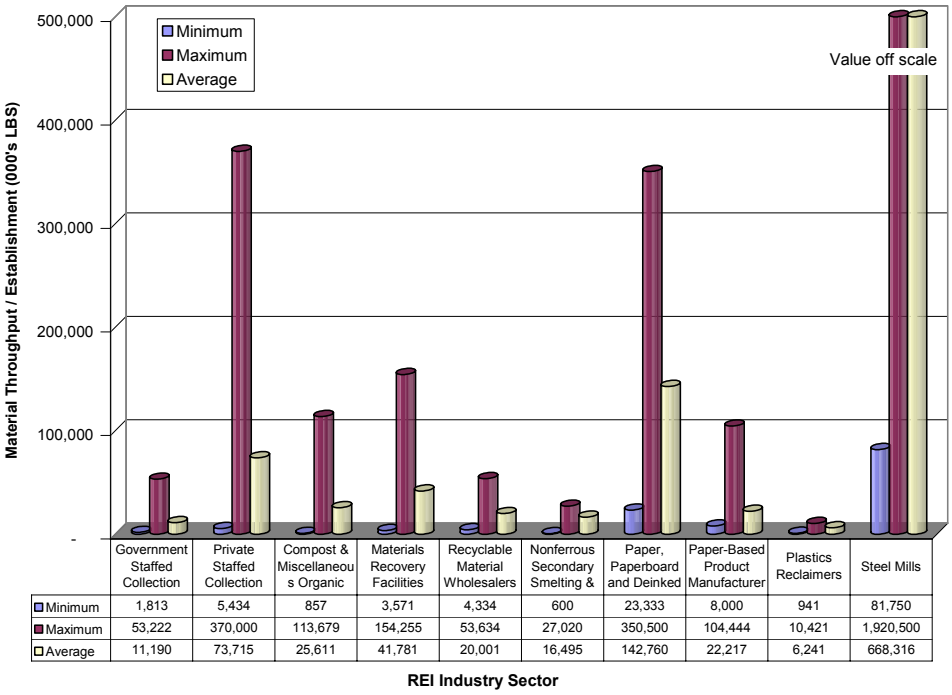


Figure 10: REI Number Employees per Establishment

in Figure 11. Material throughput per establishment is charted as thousands of pounds throughput by sector. Minimum, maximum and average values are presented which represent the relative quantity of material processed per business by sector. Comparable results were not computed for the recycling benchmark companies so that company confidentiality was maintained.



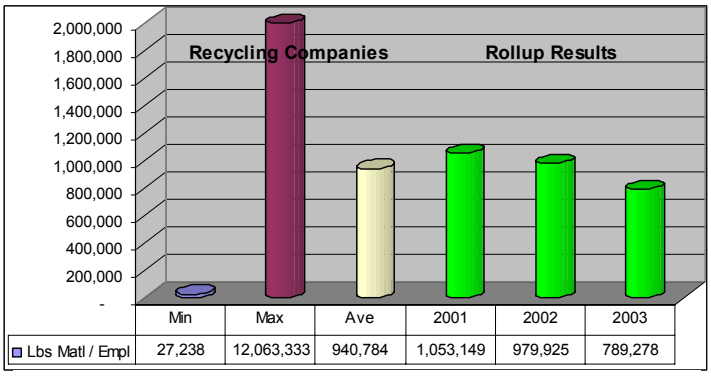
	Government Staffed Collection	Private Staffed Collection	Compost & Miscellaneous Organic	Materials Recovery Facilities	Recyclable Material Wholesalers	Nonferrous Secondary Smelting &	Paper, Paperboard and Deinked	Paper-Based Product Manufacturer	Plastics Reclaimers	Steel Mills
Minimum	1,813	5,434	857	3,571	4,334	600	23,333	8,000	941	81,750
Maximum	53,222	370,000	113,679	154,255	53,634	27,020	350,500	104,444	10,421	1,920,500
Average	11,190	73,715	25,611	41,781	20,001	16,495	142,760	22,217	6,241	668,316

Figure 11: REI Material Throughput per Establishment

Private staffed collections, steel mills and paper, paperboard & deinked establishment have the largest throughput while compost, materials recovery facilities and paper-based product manufacturers have intermediate throughput. The lowest throughput sectors, with the exception of steel mills, tend to exhibit higher receipts per pound of material processed. This is partially due to higher intrinsic value of the recyclable material or service and pricing strategy to meet operating profit needs.

A further breakdown of throughput per establishment leads to pounds of material processed per employee, another indicator of productivity as well as characteristic of industry sector processes.

Quantity of material processed per employee in a given time period is indicative of process efficiency & assets provided. However, not all companies are equal because of their specific type of business. For example, some recycling segments are very labor intensive with relatively low investment in physical assets while others use very expensive equipment, high degree of automation and few employees.



	Min	Max	Ave	2001	2002	2003
Lbs Matl / Empl	27,238	12,063,333	940,784	1,053,149	979,925	789,278

Figure 12: Lbs Material per Employee

2003 recycling company benchmark for pounds of material processed per employee is 789,278, Figure 12. This corresponds to 65,773 pounds per employee per month. Minimum processed per employee was 27,238 pounds with 12,063,333 pounds / employee as the maximum.

The benchmark does not reveal range of performance for different types of recycling businesses due to the limited size of the benchmarking population. The REI study results are useful for additional insight.

The REI Industry Sector data, Figure 13, illustrates that very high amounts of material processed are associated with the collections and compost & miscellaneous organic sectors. Up to 61,667,000 pounds per employee was reported for Private Staffed Collection and up to 10,748,000 pounds / employee in the Compost & Miscellaneous Organic Sectors. Materials Recovery Facilities, Recyclable Material Wholesalers, Steel Mills and Government Staffed Collections represent intermediate levels of materials processed per employee.

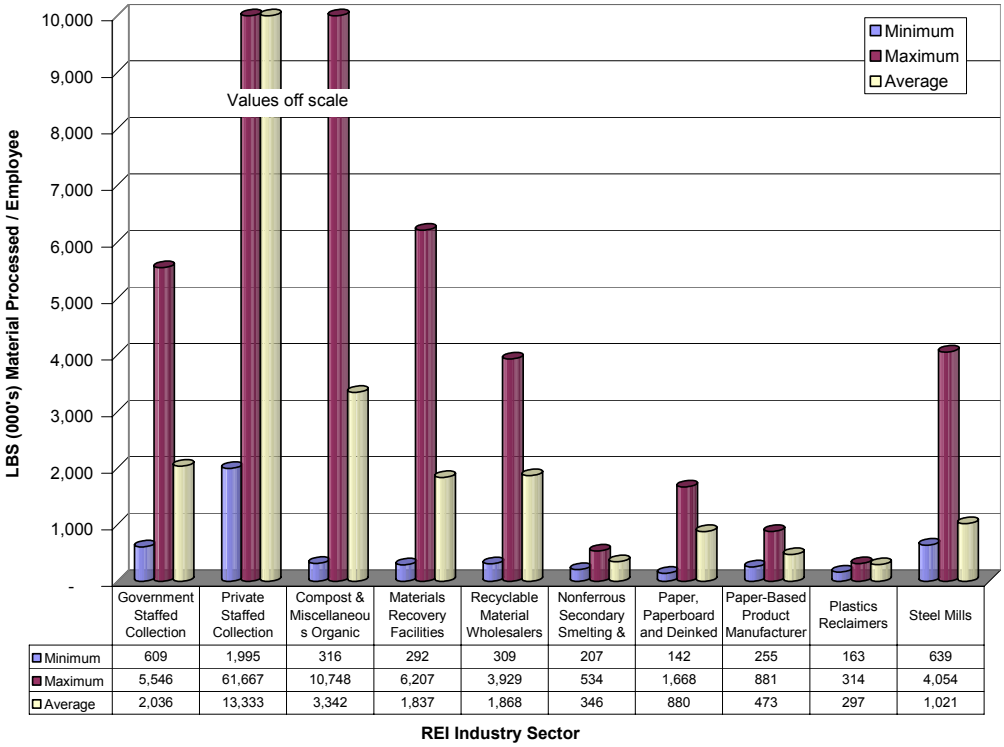
The REI Industry Sector range of "pounds material processed per employee" performance data is fully spanned by the benchmarking companies. ***Use the REI Industry Sector in conjunction with the recycling company benchmark results for comparison to individual company performance.***

Neither benchmarking results nor REI study data presented so far give any indication as to whether individual companies or even sectors can survive over the long-term. Obviously, the opportunity and desire to participate in an important and growing industry is present.

Many recycling businesses have started and failed over the past decade. Some thrive and others seem to limp along. What are the keys to business survival? What level of profitability enables sustainable operations? What financial performance is necessary to achieve substantial growth over the long-term?

Guidance is provided in the following performance management related sections starting with Z-Score, a measure of survivability, proceeding through profitability and asset utilization. Insight is subsequently provided into management of working capital, cash management and capitalizing the business through retained earnings, debt and equity investment. Benchmarking report sections are organized in order of management priority.

These sections lead to performance benchmarks relating to value creation and various returns on equity and assets. Following the guidance provided by the management sections lead to the performance results benchmarked in the latter "returns" section.



	Government Staffed Collection	Private Staffed Collection	Compost & Miscellaneous Organic	Materials Recovery Facilities	Recyclable Material Wholesalers	Nonferrous Secondary Smelting &	Paper, Paperboard and Deinked	Paper-Based Product Manufacturer	Plastics Reclaimers	Steel Mills
Minimum	609	1,995	316	292	309	207	142	255	163	639
Maximum	5,546	61,667	10,748	6,207	3,929	534	1,668	881	314	4,054
Average	2,036	13,333	3,342	1,837	1,868	346	880	473	297	1,021

Figure 13: REI Lbs Material Processed per Employee

SURVIVABILITY

Z-Score is widely regarded as a measure of a business ability to survive. Developed as a bankruptcy predictor in 1968 by Edward Altman, Z-Score is known to be approximately 90% accurate in predicting business failure within one year and about 80% accurate for two years in advance. Some practitioners use a general statement of 85% accuracy in predicting business failure. Many banking and lending institutions use Z-Score as part of their evaluation process to determine credit worthiness and risk assessment process.

Probability for business failure is very high for Z-Score values of 1.8 or less. Z-Score values from 1.81 to 2.99 exhibit uncertainty as to failure or success. It depends on the make up the actual Z-Score and actions undertaken by the business to correct temporary deficiencies. A score over 3.0 generally signals that failure is unlikely. However, high Z-Scores are not necessarily predictive of success and must be viewed cautiously with particular attention paid to the make up of the score.

The graphical presentation below, Figure 14, illustrates a range of Z-Scores and the contribution from each Z-Score component. Data was derived from 107 publicly traded and privately owned businesses representing a range of commercial and industrial segments.

Z-Score = 1.2 * X1 + 1.4 * X2 + 3.3 * X3 + 0.6 * X4 + 0.999 * X5.

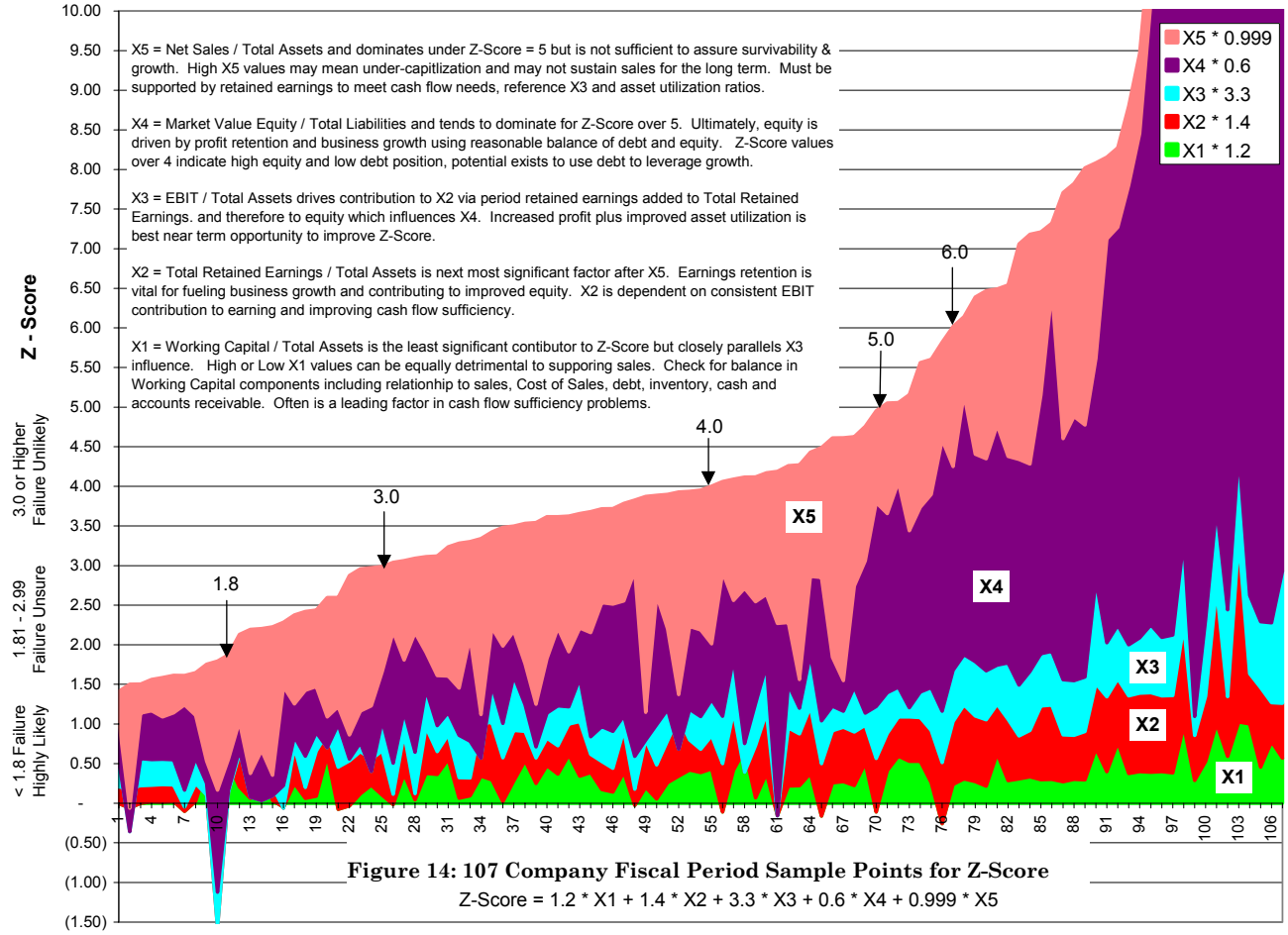


Figure 14: 107 Company Fiscal Period Sample Points for Z-Score

Each color band represents one of the "X" components. Any particular Z-Score results from adding the value of each vertically stacked color band according to the above formula. Note for Z-Score (vertical axis) above 5.0, equity (X4 component) drives the overall score as evidenced by large contribution from the plum (X4) colored band. X5, a measure of a business ability to generate sales on company assets, dominates under Z-Score values of 5 but earnings ability (X3) ultimately determines survivability.

A combination of data is used to establish survivability benchmarks for the participating recycling companies. Recognizing that low Z-Scores signal business failure and high values may not be meaningful dictated that limits be imposed on this survivability measure. Analysis of data from the private and publicly traded companies presented in the previous graph focused on Z-Scores ranging from 3.0 to 5.0. Specifically, a determination was made as to the make up of each score and what limits can be assigned to each "X" component that would yield a Z-Score value between 3.0 and 5.0 with 4.0 as the target or desired Z-Score.

The derived limits for Z-Score are presented in the "Speedometer" chart at right, Figure 15, and contributing "X" components in subsequent paragraphs. A graph presenting recycling company minimum, average, maximum and yearly "Rollup Results" is immediately below each speedometer chart.

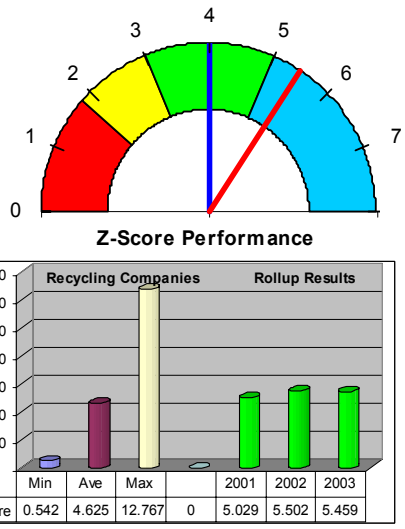


Figure 15: Z-Score Performance

The "Rollup Results" are in fact the benchmark values of performance for the recycling companies. The term "rollup" describes the process used to combine all participating recycling companies into a single "super company". This yields a result that is effectively a weighted average value which is more indicative of overall industry performance than the minimum, average and maximum values. These latter values however do provide a view into the range of performance for the recycling companies without compromising the confidentiality of each company proprietary data. The "Rollup Results" also provides a "context" benchmark set in that all results presented in this report are in contextual relationship to each other and to actual company performance in all aspects of operational and financial results.

- The speedometer green band is the desired range of performance for each survivability measure component.
- Values falling into the red zone indicate contribution to possible failure while yellow is the cautionary zone.
- Blue band signifies generally superior results.
- The blue pointer is the target value and is generally pointing to the mid-point of the green zone.
- The red pointer is the 2003 recycling company benchmark or "Rollup" result. Optimum survivability performance is achieved when the red pointer falls within the green zone for all "X" components and will result in a calculated Z-Score value >3.0.

Recycling industry Z-Score benchmark for 2003 is 5.459 as shown in the chart immediately below the speedometer chart in both the graph and associated table of values, Figure 15.

Z-Score "X" components are defined as follows and discussed in order of importance and influence in subsequent paragraphs.

- **X3 = EBIT / Total Assets**
- **X5 = Net Sales / Total Assets**
- **X2 = Total Retained Earnings / Total Assets**
- **X4 = Market Value Equity / Total Liabilities**
- **X1 = Working Capital / Total Assets**

X3 recycling benchmark value for 2003 is 0.151, Figure 16, or each dollar of total assets generated $0.151 dollars in earnings before

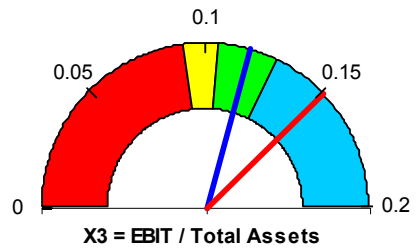


Figure 16: X3 = EBIT / Total Assets

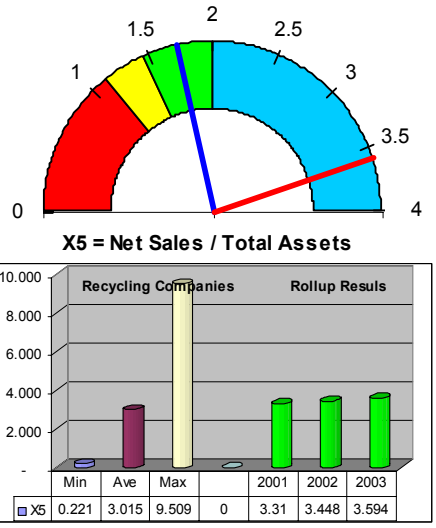


Figure 17: X5 = Net Sales / Total Assets

deducting interest and taxes. Target value is 0.117 with green zone limits of 0.105 to 0.129. Earnings drive company health in both the short and long term. This Z-Score "X" component is defined as X3 = EBIT / Total Assets and drives contribution to X2 via period retained earnings added to Total Retained Earning and therefore to equity which influences X4. Increased profit plus improved asset utilization is best near term opportunity to improve Z-Score. "EBIT" is earnings before interest and taxes. Some proponents include interest in this calculation although the developer of the Z-Score bankruptcy predictor did not. See "Profitability" section for more earnings benchmark information.

X5 recycling 2003 benchmark is 3.594 or each dollar of total assets generates $3.594 in net sales, Figure 17. Target value for this survivability component is 1.727 with 1.457 and 1.997 as lower and upper green band limits. Higher values are desired and could be quite large however caution is in order since a high value may also be indicative of an under capitalized business.

This "X" component measures a firm's ability to generate sales with the total assets provided by company management. It is defined as X5 = Net Sales / Total Assets and dominates under Z-Score = 5 but is not sufficient to assure survivability & growth. High X5 values may mean under-capitalization and may not sustain sales for the long term. X5 must be supported by retained earnings (X2) to meet cash flow needs. See "Assets Performance" section for further discussion on related asset performance measures.

X2, defined as Total Retained Earnings / Total Assets, is next most significant factor after X5. Earnings retention is vital for fueling business growth and contributing to improved equity. X2 is dependent on consistent EBIT contribution to earnings and improving cash flow sufficiency. It is a measure of profitability over time and is critical to improving X4.

X2 recycling 2003 benchmark is 0.326 or $0.326 retained earnings for each dollar of total assets, Figure 18. There was a large range of performance for the recycling companies for this Z-Score component. This is partially because many of the companies are sub-chapter "S", sole proprietor or partnerships of one form or another where distributions are made to individual owners for payment of taxes and/or compensation. The owners' subsequently "loan" funds to the company to meet operational requirements. This may create some situations where reported total retained earnings may not reflect actual company performance.

Caution should be exercised in this area for it is easy to manipulate retained earnings total and give a false impression of performance.

Lower and upper green zone limits are 0.286 and 0.412 respectively with 0.349 as the target value or goal. Higher values improve equity and potential for further growth through leveraged debt or direct investment in new assets.

X4 recycling 2003 benchmark is 0.870 or $0.87 equity for each dollar of debt, Figure 19. This is a deficit position that needs to be improved. Increase earnings retention is the best short and long-term means for improving X4 contribution to Z-Score, see X2 and X3 above.

X4 is defined as Market Value Equity / Total Liabilities and tends to dominate for Z-Score over 5. In closely held businesses, Total Assets less Total Liabilities is substituted for "Market Value Equity".

Ultimately, equity is driven by profit retention and business

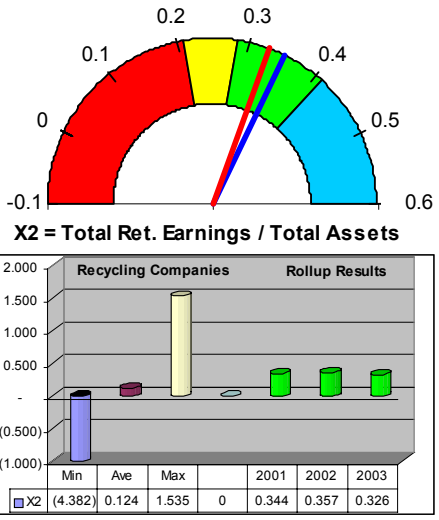


Figure 18: X2 = Total Ret. Earnings / Total Assets

growth using reasonable balance of debt and equity. Z-Score values over 5 indicate high-equity and low-debt position meaning that the potential exists to use debt to leverage growth.

This "X" component indicates a firm's ability to withstand a decline in the value of its assets and bridge short term lapses in performance in other Z-Score "X" components. Target value for X4 is 1.885 with green zone respective lower and upper limits of 1.022 and 2.748.

Go to the "Debt and Equity" section for related benchmarks and measures of performance. See "Cash Management" for cash flow sufficiency discussion.

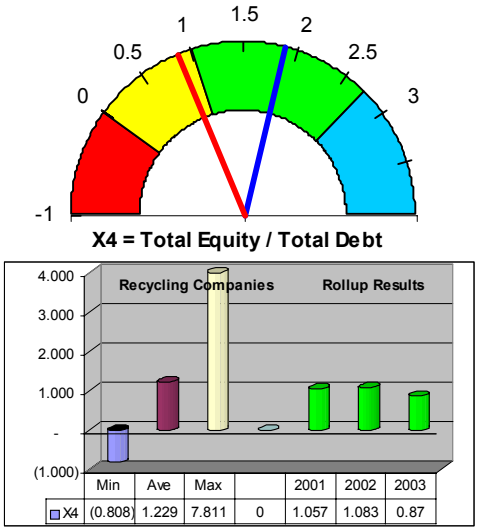


Figure 19: X4 = Total Equity / Total Debt

X1 recycling 2003 benchmark is 0.326 or $0.326 of working capital for each dollar of total assets. X1, defined as Working Capital / Total Assets, Figure 20, is the least significant contributor to Z-Score but closely parallels X3 influence. High or Low X1 values can be equally detrimental to supporting sales. Check for balance in Working Capital components including relationship to sales, Cost of Sales, debt, inventory, cash and accounts receivable. Working capital deficiency often is a leading factor in cash flow sufficiency problems.

Green zone lower limit is 0.149 and 0.299 for the upper limit with 0.224 as the desired target or goal. One issue observed for some companies was reported negative working capital, meaning that current liabilities were higher than current assets. In most cases, this likely is a book keeping issue but could also simply reflect a timing issue. However the situation occurs, negative working capital is serious and must be corrected immediately. Also, many of the recycling companies operate on a strictly cash basis with very little current liability which contributes to a high working capital. See "Working Capital Management" section for related performance measures.

Many combinations of "X" factors compute to similar Z-Scores. The chart on the following page, Figure 21, illustrates a range of experience derived from 116 fiscal periods of privately held and publicly traded companies

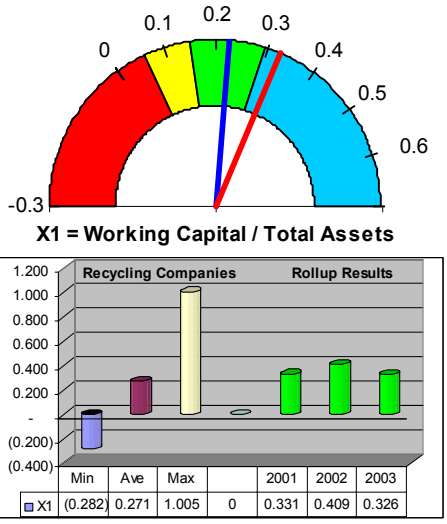
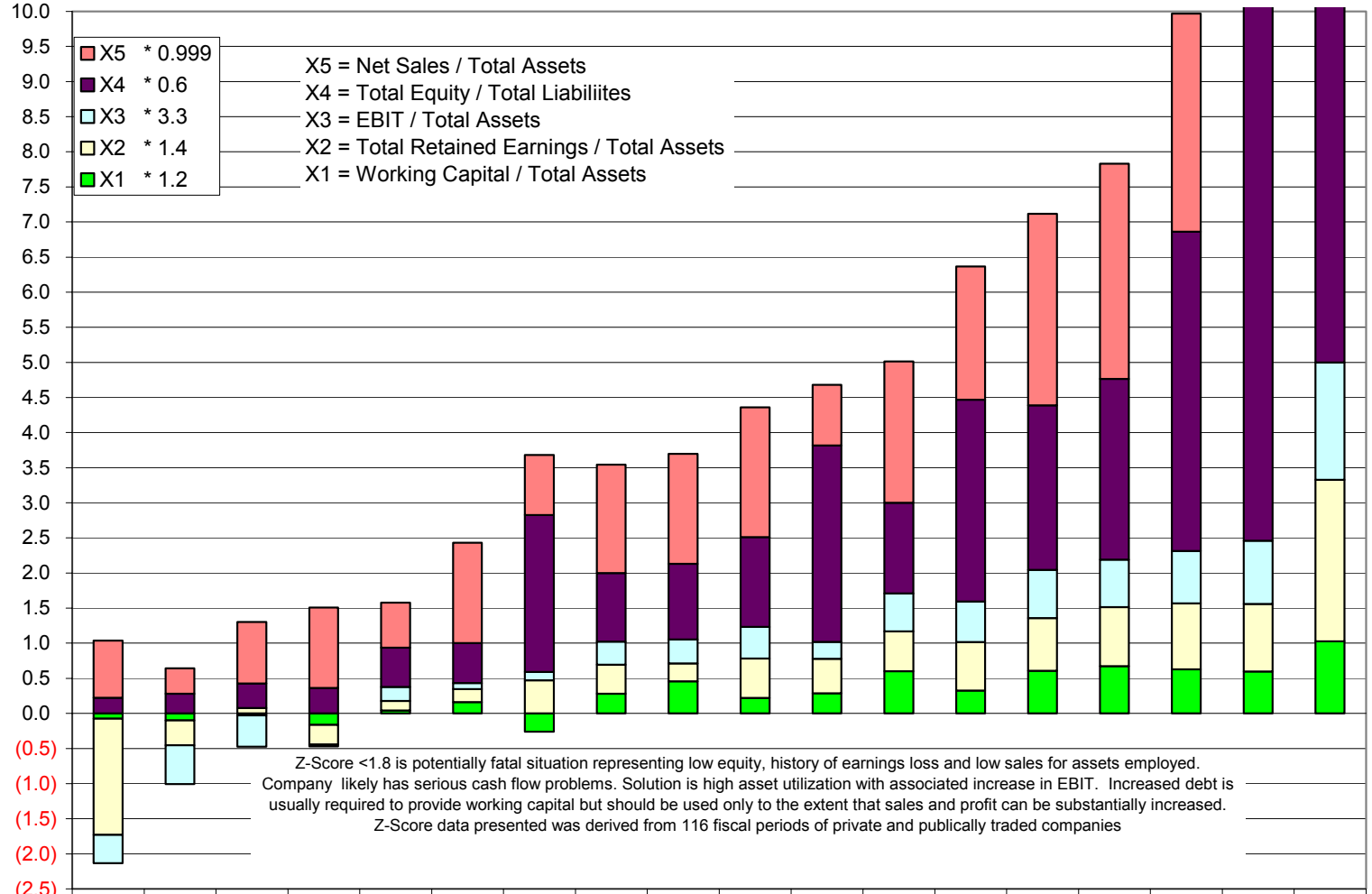


Figure 20: X1 = Working Capital / Total Assets



Z-Score	-1.0	-0.3	0.82	1.03	1.57	2.43	3.42	3.54	3.69	4.35	4.68	5.01	6.36	7.11	7.83	9.96	13.9	37.8
X5 * 0.999	0.811	0.363	0.874	1.147	0.643	1.433	0.856	1.547	1.565	1.847	0.866	2.014	1.899	2.728	3.066	3.107	1.331	3.244
X4 * 0.6	0.225	0.280	0.349	0.362	0.557	0.566	2.234	0.975	1.077	1.282	2.798	1.288	2.874	2.342	2.573	4.549	10.200	29.620
X3 * 3.3	-0.404	-0.554	-0.447	-0.026	0.197	0.088	0.117	0.327	0.341	0.448	0.240	0.541	0.578	0.687	0.677	0.745	0.898	1.672
X2 * 1.4	-1.653	-0.353	0.078	-0.281	0.139	0.185	0.473	0.416	0.255	0.563	0.492	0.571	0.692	0.749	0.842	0.940	0.965	2.302
X1 * 1.2	-0.077	-0.101	-0.027	-0.162	0.041	0.162	-0.260	0.279	0.457	0.219	0.286	0.599	0.323	0.609	0.673	0.628	0.596	1.026

Figure 21: Example Range of Contributions to Z-Score.

PROFITABILITY

Several measures of profitability were computed at various points in the financial statement for benchmark purposes. Results are displayed in graph, Figure 22, and table, Figure 23, below plus a brief discussion for each measure. As in previous graphical displays, the minimum, maximum and average values were calculated as were "Rollup Results" representing the combined benchmark performance for all participating companies. Reference the "Million Dollar Quest" section of this report for an explanation as to the relationship between these performance measures and the financial statement structure.

Gross Margin %

Gross margin is the portion remaining after deducting cost of sales from revenue and is available to cover selling, general & administrative expense. ***Gross Margin % = (Net Revenue – Cost of Sales) / Net Revenue * 100***. **2003 benchmark is 21.95%** compared to extreme values of 1.16 % minimum and 56.01% maximum experienced by some of the recycling companies. In most cases, the 2003 benchmark should be considered the minimal performance level. Product pricing should be leveraged along with process improvement to achieve greater gross margin contribution to profits.

EBIT %

Earnings before interest and taxes (EBIT) is gross margin less selling, general and administrative expenses excluding interest expense, other income & expense and income taxes. **2003 benchmark is 4.20%** which should also be considered as a minimum goal for profitability performance. Higher EBIT% is desirable and likely essential for some recycling companies in order to support cash flow needs and business growth.

EBIT % = (Gross Margin – Total Operating Expense) / Net Revenue * 100.

Improve EBIT to improve X3 contribution to Z-Score.

EBITDA%

EBITDA adds back depreciation and amortization expense to EBIT. This is a better measure for comparing business performance because it eliminates the distortion caused by varying degrees of fixed asset age and depreciation methods. **2003 benchmark is 5.71%.** ***EBITDA % = (Gross Margin – Total Operating Expense + Depreciation + Amortization) / Net Revenue * 100***. Improving EBIT tends to improve EBITDA assuming that company assets are not fully depreciated.

Net Operating Profit %

Net operating profit is variously defined by businesses. In this instance ***Net Operating Profit % = (EBIT – Interest Expense) / Net Revenue * 100***. **2003 benchmark is 3.78%** and is driven by interest rates paid on notes, line of credit and long term debt. Improve credit rating equity by improving net operating profit.

Income Before Taxes %

Adding non-operating income and expenses to net operating profit yields income before taxes. **2003 benchmark is 4.64%**. Many banks, investors and lending institutions look at this profitability measure in conjunction with EBITDA % to evaluate how well a company is performing. Higher values are desirable, note that at least one recycling company achieved nearly 22% income before taxes. Income before taxes is often denoted by the abbreviation IBT.

Net Profitability %

Net profitability is usually referred to as "The Bottom Line" or net income. It is the amount of income available after taxes and adjustments for various after tax activities and extraordinary items. This is the source for preference distributions and common dividends to owners as well as retained earnings.

Net Profitability % = Net Income / Net Revenue * 100. **2003 benchmark for this profitability measure is 4.42%.** As noted previously, the recycling companies represented in this report are varied as to organization with some paying no corporate taxes. The actual tax liability falls to the business owners and is recorded as a preference distribution in this benchmark effort.

Common Profitability %

Common profitability is the income available for distribution as a dividend to common stock shareholders or contribution to retained earnings. ***Common Profitability % = (Net Income – Preference Distributions) / Net Revenue * 100***. **2003 benchmark for this profitability measure is 1.42%.** The difference between this value and net profitability % represents the portion distributed to business owners. Limiting distributions to shareholders is one means to improve retained earnings.

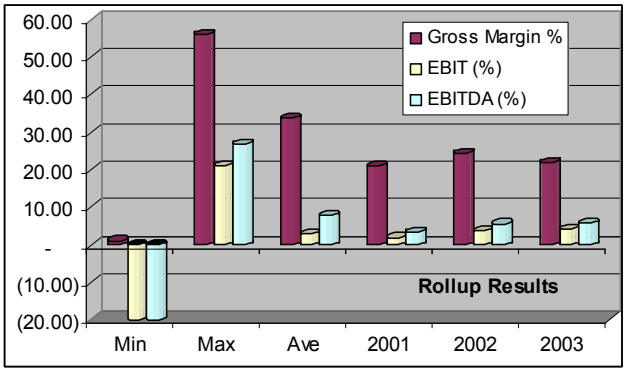


Figure 22: Gross Margin %

Profitability	Min	Max	Ave	2001	2002	2003
Gross Margin %	1.16	56.01	33.59	20.98	24.41	21.95
EBIT (%)	(44.01)	21.07	2.87	1.91	3.68	4.20
EBITDA (%)	(44.01)	26.83	7.85	3.47	5.67	5.71
Net Operating Profit (%)	(44.01)	21.07	1.42	1.27	3.25	3.78
Income Before Taxes (%)	(43.27)	21.84	2.53	1.58	4.27	4.64
Net Profitability (%)	(43.27)	21.84	1.82	1.35	3.71	4.42
Common Profitability (%)	(43.27)	21.84	(1.71)	(0.35)	1.57	1.42

Figure 23: Profitability Table

ASSET PERFORMANCE

There are several benchmarks related to asset performance starting with the top-level metrics discussed below. Further breakdown is presented in subsequent sections dealing with working capital and cash management. The immediate discussion deals with overall management effective in utilizing business assets to generate sales and provide for major physical asset

Total Asset Utilization

Total asset utilization has already been presented as X5 in Z-Score and is Net Sales / Total Assets. **2003 benchmark is 3.59** as shown in Figure 24 & 25. Note the minimum and maximum performance for the recycling companies with net revenue ranging from $0.22 to $9.51 for each dollar of total assets. Higher values are desired with a minimum "green zone" range from1.46 to 2.00 for total asset utilization assuming other Z-Score components also fall into the green or blue zone as previously discussed.

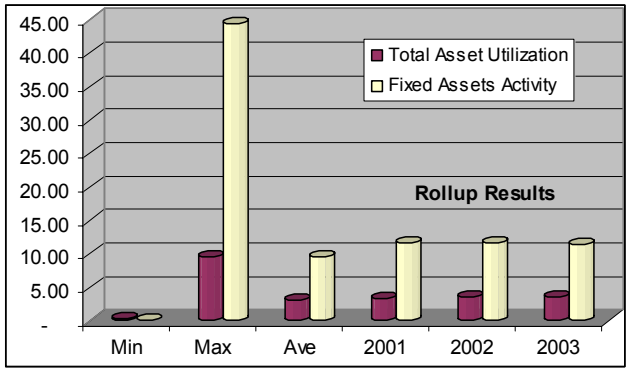


Figure 24: Asset Utilization

Fixed Asset Activity

Fixed asset activity is a measure of business ability to generate sales on net fixed assets. It is influenced by the mix of assets, depreciation extent and asset productivity. Older assets can be very productive leading to high values for this benchmark which can be misleading when comparing individual company performance. Always look at the depreciated asset ratio in conjunction with fixed asset activity ratio. **2003 benchmark is 11.32** or it can be viewed as generating $11.32 net revenue for each dollar net fixed asset utilized. Some companies had relatively small amount of net fixed assets, a few had highly depreciated assets as shown by the minimum, and maximum fixed assets activity and depreciated asset ratios.

Figure 25: Asset Performance Table

Asset Performance	Min	Max	Ave	2001	2002	2003
Total Asset Utilization	0.22	9.51	3.01	3.31	3.45	3.59
Fixed Assets Activity	-	44.38	9.62	11.65	11.56	11.32
Depreciated Asset Ratio	-	0.86	0.48	0.62	0.63	0.60
Activity	0.31	23.30	4.41	4.78	4.70	5.14

Depreciated Asset Ratio

Depreciated asset ratio is a rough measure of depreciable fixed asset age but is constrained by the fact that companies may have purchased older yet productive equipment. It is also affected by the method used to depreciate assets whether straight line or some accelerated computation. **Recycling company benchmark for 2003 is 0.60** or represents approximately 60 % of fixed asset is depreciated. ***Depreciated Asset Ratio = Accumulated Depreciation & Amortization / Total Depreciable Fixed Assets.***

Activity

Activity is a measure of management effectiveness using business assets to generate sales. It is ***Net Closing Assets / Net Sales or (Total Assets – Current Liabilities) / Net Sales***. **2003 recycling company benchmark is 5.14** or may be viewed as generating $5.14 net revenue for each dollar of net closing assets. Higher values are desirable but caution is warranted because of potential for under-capitalization yielding a misleading high benchmark result. Managing for optimum Total Asset Utilization is the best way to improve this metric.

WORKING CAPITAL

Working capital is the lifeblood of a business. Most companies that fail do so from an inability to support sales and meet short term obligations. Multiple measures are available to manage the makeup of working capital and are presented below along with recycling company benchmark results, Figures 26 - 28. The first three ratios discussed are key contributors to overall cash flow management as well as indicating how well working capital is being managed. Any negative value working capital benchmark is a serious problem that needs immediate correction.

Working Capital Days of Net Sales

Working capital days of net sales measures how many days of net revenue is tied up in working capital. That is, ***Working Capital Days of Net Sales = Working Capital / Net Revenue * 365***. Low values tend to show problems in ability to support sales while high values may indicate under-capitalization problems. **2003 recycling company benchmark is 33.1 days of net sales tied up in working capital.** A balance must be achieved based on the particular market needs being served and ability of the company to meet short-term requirements. 30 to 60 days is typical but some high technology companies that have high profit margins may have 6 months or more net sales in working capital. Generally, recycling companies should be in the 30 to 60 day range depending on market, profitability and cash flow factors.

Accounts Receivable to Working Capital Ratio

Accounts Receivable to Working Capital = Total Accounts Receivable / Working Capital where Working Capital is Current Assets – Current Liabilities. This is a measure of how much of working capital is tied up in receivables or monies owed the company but not collected.

A related measure is Accounts Receivable Days discussed in the Cash Management section of this report. **2003 recycling benchmark is 0.87** compared to 0.70 average for all participating companies. Note the large range of experience for the companies. Values over 1 indicate high dependence on receivables for working capital and very high values could signal insufficient working capital. High values also contribute to cash flow problems. Use this metric in conjunction with Accounts Receivable Days for optimizing contribution to working capital.

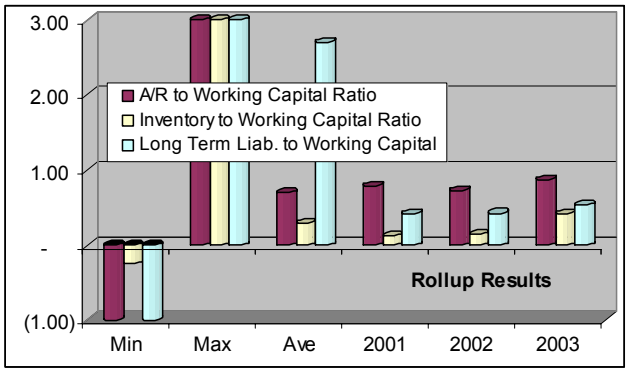


Figure 26: Working Capital – Receivables, Inventory & Long-Term Liabilities

Inventory to Working Capital Ratio

Inventory to working capital ratio is similar to accounts receivable influence on working capital makeup. However, high values over 1.0 are even more serious because inventory cannot be as readily converted to cash. Inventory Days is a related metric discussed in Cash Management that should be used to help manage the inventory component of working capital. **2003 benchmark is 0.42** for recycling companies with many companies carrying little or no inventory valuation. For these companies, a value approaching zero may be appropriate.

Figure 27: Working Capital Management

Working Capital Management	Min	Max	Ave	2001	2002	2003
Working Capital Days of Net Sales	(30.07)	660.61	90.93	36.52	43.26	33.10
Working Capital % of Net Sales	(8.24)	180.99	24.91	10.01	11.85	9.07
A/R to Working Capital Ratio	(2.24)	7.76	0.70	0.79	0.72	0.87
Inventory to Working Capital Ratio	(0.24)	6.28	0.30	0.12	0.14	0.42
Net Sales to Working Capital Ratio	(22.91)	106.54	12.51	10.00	8.44	11.03
Long Term Liab. to Working Capital	(20.71)	57.93	2.70	0.42	0.42	0.53

Long Term Liabilities to Working Capital Ratio

Long Term Liabilities to working capital ratio is a measure of how working capital is being funded. Values over 1.0 indicate that long-term debt is being used to provide working capital. Using long-term to fund short-term needs is generally not a good idea but can be used to leverage growth when high sales and profit potential exists. **2003 benchmark for recycling companies is 0.53,** with low values typically being desired**.** Minimum and maximum extremes exist for participating companies that need correction since both extremes signal problems in providing essential working capital.

Working Capital % of Net Sales

There is no particular guidance for Working Capital % of Net Sales but some businesses use it as a guideline for planning working capital. The more common measure is Net Sales to Working Capital ratio, which is the inverse of Working Capital to Net Sales, expressed as a percentage. **2003 recycling company benchmark is 9.07%.** Negative values represent a serious problem that must be corrected.

Net Sales to Working Capital Ratio

Net Sales to Working Capital represents the amount of sales that can be generated with each dollar of working capital. Very high values and low values are problematic and usually signal under-capitalization problems. **2003 recycling company benchmark is 11.03** meaning that the combined companies generated $11.03 net revenue for each dollar of working capital employed. Note that if you carry out the following calculation, 1 / 11.03 * 100 = 9.07%, the result is working capital % of net sales benchmark for 2003.

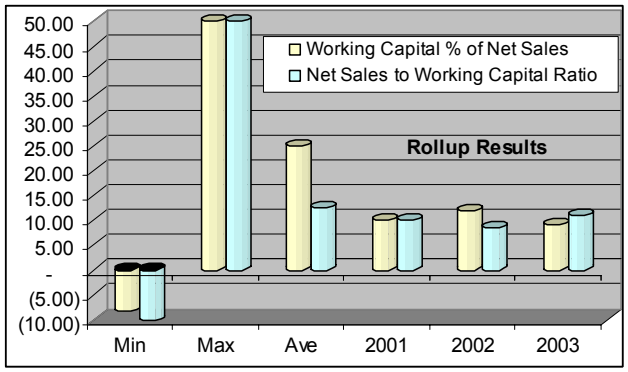


Figure 28: Working Capital – Net Sales

CASH MANAGEMENT

Cash management has many contributing components other than dollar bills. Some of the key factors are covered below, Figures 29 – 31, and should be one of the first performance measures that company management consider in managing company well being and growth potential.

Cash Flow Sufficiency

Cash Flow Sufficiency ties together the income statement and balance sheet by measuring the degree to which retained earnings from net income is able to pay for changes to Total Net Assets without consideration for depreciation and amortization as a cash source. ***Cash Flow Sufficiency = Retained Earnings – Change in Total Net Assets***.

Negative values indicate that retained earnings was not sufficient to pay for an increase in Total Net Assets, therefore additional funding is required from either long-term debt or equity placement. ***Total Net Assets = Total Assets – Current Liabilities and Change in Total Net Assets = Closing Net Assets – Opening Net Assets.***

The "normalized" Cash Flow Sufficiency 2003 benchmark is -$13,746 on net revenue of $1,000,000.

In fact, 2001 and 2002 also were negative indicating in general that participating companies had to either employ long-term debt or use additional paid in capital to sustain operations. Minimum, maximum and average values were not calculated to preserve company data confidentiality.

Cash Flow Sufficiency is a good performance measure for planning future business financial needs in that it highlights the magnitude of funding requirement or excess of earnings available to fuel and sustain business operations. It also helps explain why past year fiscal performance was not up to expectations or in fact had superior results.

See "Million Dollar Quest" report section for visual explanation of this performance indicator.

Accounts Receivable Days

Accounts Receivable Days = Accounts Receivable / Net Revenue * 365 days and measures the number of days of annual net revenue tied up in receivables. In strictly cash basis recycling companies this measure is near zero, for manufacturing companies, 30 to 60 days is common. A key strategy in managing cash is balancing accounts receivable with accounts payable and profitability levels. A high profit margin company can better afford longer receivable days but can still get in trouble if accounts payable days is very short. It is possible to be a profitable company but have cash flow problems because accounts are paid faster than money is coming in through receivable collections. **2003 recycling company benchmark is 28.82 days.**

Note these data are "annualized" to 365 days per year.

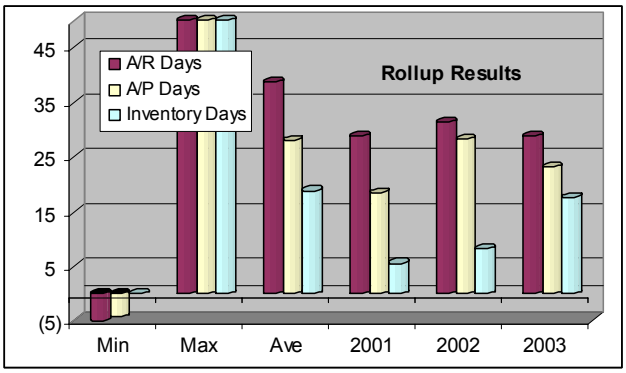


Figure 29: Cash Management – Receivables, Payable and Inventory Days

Accounts Payable Days

Account Payable Days = Accounts Payable / Cost of Sales * 365 days and is a measure of the number of days of cost of sales tied up in accounts payable. Most creditors have an expectation to be paid quickly for services and products provided and often offer discounts for speedy payment. Take advantage of discount opportunities but only to the extent that it does not jeopardize cash flow because of an extended account receivable collection cycle. **2003 recycling company benchmark is 23.18 days,** which is a reasonable balance with the 28.82 accounts receivable days and considering the profitability benchmark results and inventory days. Note that low values are generally better but should never be negative and must be balanced between payables and receivables. Very high numbers are only appropriate where market conditions and practices dictate these economic practices.

Figure 30: Cash Management Table

Cash Management	Min	Max	Ave	2001	2002	2003
Cash Flow Sufficiency				(43,685)	(5,488)	(13,746)
A/R Days	(11.63)	339.96	38.66	28.77	31.33	28.82
A/P Days	(4.17)	389.91	28.09	18.46	28.23	23.18
Inventory Days	-	371.42	18.82	5.55	8.19	17.66
Inventory Utilization	-	6,966.95	374.41	83.26	58.94	26.48
Days Cash on Hand	(0.69)	201.50	19.37	6.05	6.25	6.35
Days Receivable Cash	(11.63)	339.96	38.66	28.77	31.33	28.82
Days Inventory Cash	-	265.71	13.43	4.38	6.19	13.79
Ttl Cash Trading Cycle	4.52	807.16	71.46	39.20	43.77	48.96
Days Payable Cash	(3.21)	278.94	20.31	14.58	21.34	18.09
Net Cash Operating Cycle Days	(16.76)	528.23	51.15	24.62	22.43	30.86

Inventory Days

Inventory Days = Inventory / Cost of Sales * 365 days and is a measure of the days cost of sales tied up in inventory. Many recycling companies do not carry or value inventory. This is true for collectors and some processors, however, higher value-added recycling operations such as manufacturers carry some level of inventory. This benchmark could further be broken into raw material days, work-in-process days and finished goods days. The small sampling of companies in this benchmark effort does not warrant further breakout of inventory components. **2003 recycling company benchmark is 17.66 Inventory Days**, which is up from 5.55 days in 2001 and 8.19 days in 2002. The trend partially is due to recycling market conditions and partly related to the changing company makeup of the benchmark population. Inventory should be managed to the level necessary to support market demands and should be the lowest level possible considering time to process and deliver the business goods and services. Inventory is often not readily convertible to cash, which is why minimizing inventory is essential to supporting cash flow management.

Inventory Utilization

Inventory Utilization = Net Revenue / Inventory and is a measure of sales dollars generated on each dollar of inventory. Higher values are desirable but only to the extent that customer and market demands are met. Very high values indicate a low inventory level, which in turn could mean that customer demands are not being met resulting in potential market share loss to competitors. **2003 benchmark is 26.48 or each dollar of inventory generates $26.48 net revenue.** This is a high value but is at least partially due to the mix of companies participating in the benchmark effort. Use inventory days and other working capital benchmarks as better indicators for managing cash and inventory management performance.

Days Cash on Hand

A suitable balance of cash on hand and cash equivalents is critical to meeting short-term liabilities and filling the gap resulting from the accounts receivable collection cycle and supplying inventory to operating processes.

Days Cash on Hand = Cash / Net Revenue * 365 and is a measure of how many days of sales is available as cash on hand or equivalents. General business practice is to have 3 to 12 days of cash on hand but could

be lower for some cash based businesses. Negative values signal serious problems that need immediate correction through improved profitability or reduction in the receivable collections cycle. **2003 recycling industry benchmark is 6.35 days compared to a typical guideline of 8 days of cash on hand or 2% of net revenue**. Very high days cash on hand likely means that cash is not being effectively managed and could yield a higher return to the business through short term investments or acquisition of assets to leverage revenue growth and profitability. Days Cash on Hand is one component of the total cash trading cycle discussed in subsequent paragraphs.

Days Receivable Cash

Days Receivable Cash = Accounts Receivable / Net Revenue * 365 and is the same as Accounts Receivable days. Similar to Days Cash on Hand, Days Receivable Cash represents the portion of net revenue tied up in accounts receivable. The discussion in Accounts Receivable Days management applies to Days Receivable Cash. **As noted previously, 2003 recycling benchmark is 28.82 days.** Days Receivable Cash is another component used to calculate total cash trading cycle.

Days Inventory Cash

Days Inventory Cash = Inventory / Net Revenue * 365 which is different from Inventory Days previously presented. Here the focus in on how much of net revenue is tied up in inventory. **The 2003 recycling benchmark is 13.79 days**. An important consideration here is the production or processing cycle time for generating the business product or service. Longer cycle times generally require larger Days Inventory Cash values. The discussion for Inventory Days is relevant in management of the inventory level in that minimal inventory to support customer and market demand is the goal. Days Inventory Cash benchmark puts the focus on cash management as a component of total cash trading cycle.

Total Cash Trading Cycle

Total Cash Trading Cycle is the sum of Days Cash on Hand + Days Receivable Cash + Days Inventory Cash. **2003 recycling benchmark is 48.96 days of net revenue** tied up in these three current asset components. Very low values may be okay for a strictly cash business but generally is between 30 and 60 days depending on market conditions and business considerations. Very high values indicate potential cash flow problems that need to be investigated depending on contributions from cash on hand, receivables, and inventory. Refer to above discussions for guideline to management of these contributors to total cash trading cycle.

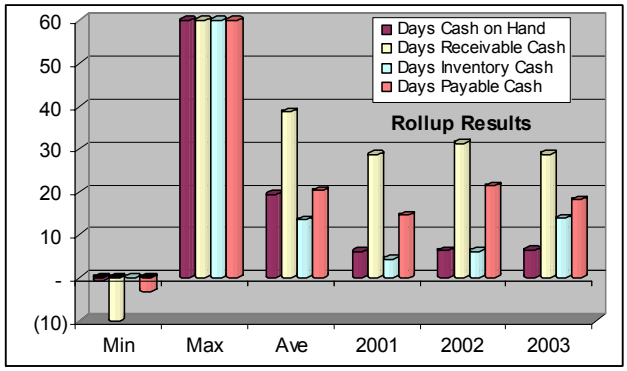


Figure 31: Cash Management – Trading Cycle

Days Payable Cash

D***ays Payable Cash = Accounts Payable / Net Revenue * 365*** representing the days of net revenue claimed by payables to suppliers and service providers. This is a component of Net Cash Operating Cycle Days discussed below. In general, the Accounts Payable Days discussion applies to this performance measure in that a balance between receivables and payables is desired. **2003 recycling company benchmark is 18.09 days of net revenue claimed by accounts payable.** This appears to be reasonable considering the account receivable days and account payable days benchmark. Use the guidance in Accounts Payable Days for managing this contributor to Net Cash Operating Cycle Days.

Net Cash Operating Cycle Days

Net Cash Operating Cycle Days is a rough measure of the number of days it takes for a business to recover a dollar spent. It is ***equal to Total Cash Trading Cycle – Days Payable Cash*** resulting in **2003 recycling benchmark of 30.86 days.** For most companies, this is a very reasonable Net Cash Operating Cycle but again it depends heavily on the makeup within Total Cash Trading Cycle.

Use Net Cash Operating Cycle Days as a principle tool in evaluating cash management effectiveness.

DEBT AND EQUITY

Debt and equity components of the balance sheet are benchmarked in this section, Figures 32 – 34, and useful in evaluating financial solvency and liquidity. These elements supplement retained earnings for fueling business growth and sustaining day to day operations. A certain amount of debt is normally required by most businesses at some point. Banks and lending institutions examine the current ratio, quick ratio and debt to equity ratio as key indicators of business credit worthiness. Other ratios presented below give additional insight into the use of debt and equity to support business operations.

Current Ratio

Current ratio is ***current assets divided by current liabilities***. Typical guidance is a ratio of 2.0 for this performance indicator. **2003 recycling company benchmark is 2.08** with a range exhibited by the minimum, maximum and average showing in general the low level of current liabilities for most of the benchmarked companies. Use the guidelines presented in working capital management to achieve the appropriate level of these working capital elements.

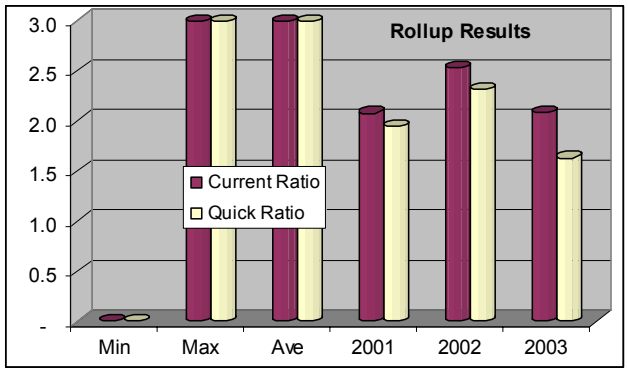


Figure 32: Current & Quick Ratio

Quick Ratio

Quick ratio is similar to Current Ratio except that ***inventory is excluded from current assets***. The measure represents a company's ability to quickly convert current assets into cash. Typical guidance is to strive for a quick ratio of 1.0. **2003 recycling company benchmark for Quick Ratio is 1.63** representing two basic facts. One is that the participating recycling companies in general maintained low inventory levels and, two, often had very low current liabilities. A larger sample of recycling companies would likely move the benchmark closer to 1.0. Management guidance is the same as for the current ratio and working capital components previously discussed.

Current Liabilities to Net Worth

Current Liabilities / Net Worth (also known as equity) = Current Liabilities to Net Worth ratio and is a measure of equity availability to meet short-term obligations. A low value is favorable while a value greater than 1.0 signals the need to use long-term debt to support short-term liabilities or that the company must act to get an infusion of capital from owners. **2003 benchmark for this performance measure is 0.65.** Negative values should be treated as a very large number and requires immediate correction of the contributing factor causing the negative result.

Figure 33: Debt & Equity Management Table

Debt & Equity Management	Min	Max	Ave	2001	2002	2003
Current Ratio	-	4,874.27	159.16	2.08	2.54	2.08
Quick Ratio	-	4,874.27	159.01	1.95	2.32	1.63
Cur. Liab to Net Worth	(4.62)	3.03	0.42	0.60	0.51	0.65
Noncurrent Assets to Equity Ratio	(3.57)	11.95	1.52	0.70	0.63	0.80
Debt to Equity Ratio	(7.39)	12.77	1.45	0.95	0.92	1.15
Long Term Financing	-	5.86	0.63	0.38	0.53	0.47
Trading Ratio	(41.27)	23.42	5.33	6.44	6.63	7.72

Non-current Assets to Equity Ratio

Non-current assets to equity ratio = Total Non-Current Assets / Owners' Equity and is similar in purpose to the previous measure except that attention is focused on non-current assets. It represents the company ability and use of equity to fund non-current assets. Low values tend to be favorable while a value

over 1.0 reveals dependence on long-term debt to fund non-current assets as well as cover shortfalls in working capital. **2003 recycling company benchmark is 0.80** although typical values may range between 0.5 and 1.3. The higher values are appropriate when funding fixed asset acquisition to promote revenue growth and increased profitability in the near-term.

Note from the minimum, maximum and average Non-current Assets to Equity ratio, -3.57, 11.95 and 1.52 respectively, that many of the recycling companies likely have performance problems relating to this benchmark.

Manage for higher asset utilization and increased profitability to improve this benchmark performance.

Debt to Equity

Debt to Equity ratio is the inverse of the X4 factor discussed in the Z-Score report section. Low values indicate high equity levels and is generally desirable. Conversely, values over 1.0 indicate higher debt levels that tend to reduce credit worthiness. This is a key risk factor that many banks, lending institutions and potential investors consider in determining credit worthiness and investment opportunity. Manage this performance ratio through the profitability and asset utilization benchmarks presented in earlier paragraphs. **2003 recycling benchmark performance is 1.15 and hovers near 1.0 for each of the previous fiscal periods.**

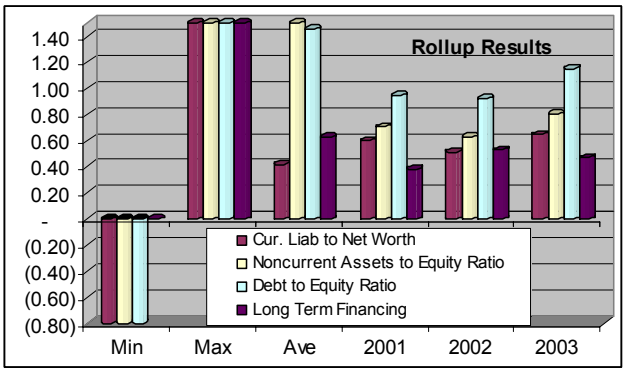


Figure 34: Debt & Equity Ratios

Improvement in retained earnings net of any owner loans and claims on earnings is the best way to improve equity. Negative values are serious and need immediate correction.

Long Term Financing Ratio

Long Term Financing Ratio = Long Term Liabilities / Total Non-current Assets and is an indicator of a company's use of long term debt to finance acquisition of fixed assets and other non-current liabilities. A value over 1.0 is undesirable since it indicates long-term debt in excess of non-current asset book value. **2003 recycling company benchmark is 0.47,** which is in line with a wide range of publicly traded company experience. Low values tend to reveal use of equity to fund non-current assets. Recycling company minimum, maximum and average results for this benchmark reveal a mix of good and mediocre performance in this area.

Long Term Liabilities is this instance includes long-term capital lease obligations.

Improve asset utilization, retained earnings and working capital management to achieve gains in long term financing ratio.

Trading Ratio

Trading Ratio is also known as Net Sales to Equity Ratio or Investment Adequacy Ratio and ***is equal to Net Sales / Owners' Equity***. It is an indication of company ability to generate sales from equity. Higher values are desired, however very high or very low values are problematic and reflective of low equity or low return on equity respectively. **2003 recycling company benchmark is 7.72 which is in line with common business experience.**

Negative values reflect negative equity resulting from prior year losses, which must be corrected with increased retained earnings or capital investment from shareholders.

GROWTH

The potential for growth is a tricky predictor in that it reflects only what might happen if everything went just right. Two benchmark measures were computed, each yielding a different view of growth potential. It is generally best to use the more conservative predictive result and plan for management actions that move the company in the desired direction. In general, the computed results reflect first hand feedback from business owners that recycling business has been improving over the past couple years although 2003 growth potential was lower than 2002. The good news is that some business owners that planned to participate in the current benchmark project bowed out because business in 2004 was booming and they did not have time to submit the required information.

Potential Annual Growth Rate (%, Beg.)

2003 benchmark for Potential Annual Growth is 28.86% based on retained earnings plus preference distributions and is a predictor based on ability of company opening equity and period retained earnings to promote revenue growth. However, ***an alternate method*** based on net income and retained earnings after preference distributions and dividends ***yields 2003 benchmark for Potential Annual Growth = 4.64%.*** This result shows the substantial impact that distributions have on this measure. Formula for the latter calculation is ***PAGRB % = Retained Earnings / Net Income * Net Income / Opening Equity * 100*** assuming annual fiscal results are used in calculation.

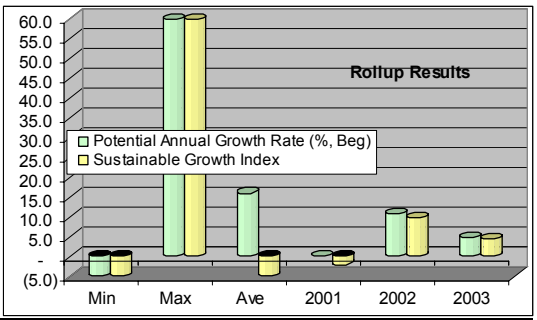
A very large number is suspect and negative values or low values indicate problems with growing or even sustaining the company. The 28.86% benchmark value is a reasonable value if you assume that distributions are insignificant but the latter result of 4.64% is more predictive of growth potential. In most cases, at least some portion of the preference distributions is not optional as it provides for payment of owners' tax liability and is therefore realistically not available for promoting business growth.

Improve retained earnings to increase equity and improve growth potential.

Sustainable Growth Index

Sustainable Growth Index is Retained Earnings / Net Income * Net Income / Ending Equity * 100. The **2003 recycling benchmark is 4.44%**. Note the extreme range for this benchmark growth predictor as reflected in the minimum and maximum values, Figure 35. Large values are suspect and low or negative values dictate need for immediate action to improve profitability, retained earnings and asset utilization. Desired sustainable growth index results should be in the 10% to 30% range.

Other variations on this calculation use income before taxes instead of net income.



Growth	Min	Max	Ave	2001	2002	2003
Potential Annual Growth Rate (%, Beg	(74.39)	292.95	15.99	-	10.91	4.64
Sustainable Growth Index	(440.28)	185.18	(10.89)	(2.06)	9.80	4.44

Figure 35: Growth

VALUE CREATION

Calculating value creation is based on the Economic Value Added model developed by G. Bennett Stewart, III of Stern Stewart & Co. The recycling company financial results were converted to an all cash basis and a consistent set of parameters applied for cash operating tax and cost of capital. It was not possible to make all of the potential adjustments to financial statements suggested by the Economic Value Added model but the impact on results obtained is not likely to be significant.

Economic Value Added is a measure of shareholder value added as a result of effectively managing company assets and resources. To protect recycling company confidentiality only certain elements related to Economic Value Added is reported in subsequent paragraphs. Some economists and financial professionals have developed variations on the Economic Value Added model, which use much of the same data but are based on averages or include or exclude certain data. Therefore, another calculation method will likely yield a different result than reported below. An explanation of Economic Value Added calculations is beyond the scope of this report and therefore computational formulas are not included.

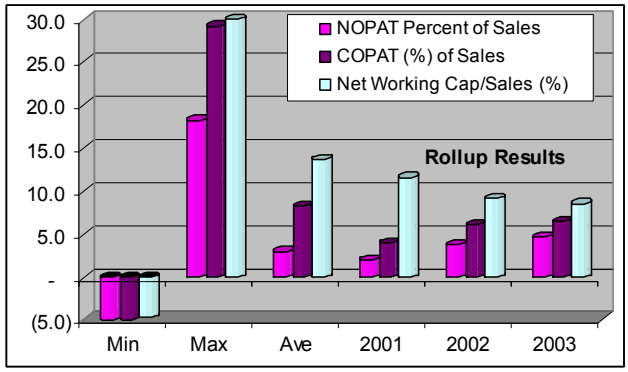


Figure 36: Value Creation – NOPAT, COPAT and Net Working Capital

NOPAT Percent of Sales

NOPAT is Net Operating Profit After Taxes and is reported as a percentage of net revenue. Many companies do not pay corporate taxes therefore a constant value of 34% was applied as the tax rate for all companies. This is not necessarily fair but it is consistent. **2003 benchmark for NOPAT % is 4.65%**, Figures 36 & 37.

Asset utilization improvement, elimination of unproductive assets or investment in higher productivity assets is the means to increase NOPAT %. These actions are the same for improving EBITDA.

COPAT % of Sales

Some large companies like to report COPAT % as a measure of profitability and indication of growth. COPAT is cash operating profit after tax. The primary difference compared to NOPAT is that depreciation and amortization is added back to NOPAT. **2003 recycling benchmark is 6.48%**, Figures 36 & 37. Improvement actions are the same as outlined above for NOPAT.

Figure 37: Value Creation Table

Value Creation	Min	Max	Ave	2001	2002	2003
NOPAT Percent of Sales	(43.27)	18.23	3.00	2.06	3.77	4.65
COPAT (%) of Sales	(43.27)	29.18	8.23	4.00	6.07	6.48
Net Working Cap/Sales (%)	(4.68)	107.82	13.69	11.59	9.14	8.54
Rate of Return % (r)	(905.39)	166.87	(5.35)	9.37	17.05	25.46
Wt. Ave Cap Cost % (c*)	5.00	14.71	12.02	11.10	11.45	10.95
Rate of Return Index (r/c*)	(180.95)	15.03	(3.86)	0.85	1.49	2.33

Net Working Capital to Sales (%)

This value creation measure is not to be confused with the previously described Working Capital to Sales % ratio. Working capital is "adjusted" by excluding interest bearing current liabilities to derive Net Working Capital to Sales %. The **2003 benchmark value is 8.54 %** of net sales compared to 9.07% for the previously discussed working capital measure, Figures 36 & 37. An improvement to working capital and current liability management directly improves this benchmark.

Rate of Return %

Rate of Return on Beginning Capital is the full name for this measure and reflects earnings achieved on capital employed and in place at the beginning of the fiscal period. Superior performance is usually associated with values around 25%. The **2003 recycling company benchmark is 25.48 %,** which marks a dramatic improvement from prior year results. Negative and very large values are both problematic representing income losses and potential under-capitalization respectively. All companies should strive for performance comparable to the 2003 benchmark through steps outlined above for NOPAT and profitability improvement.

Weighted Average Cost of Capital %

Weighted Average Cost of Capital % is the effective "interest" rate charged for the use of capital to support business operations. This value was calculated for the benchmark project and presented in Figures 37 & 38. The same parameters were used for all recycling companies without regard to size but Weighted Average Cost of Capital % is directly influenced by the debt to equity ratio. **2003 benchmark for this measure is 10.95 %** and around 11 % for the prior two years.

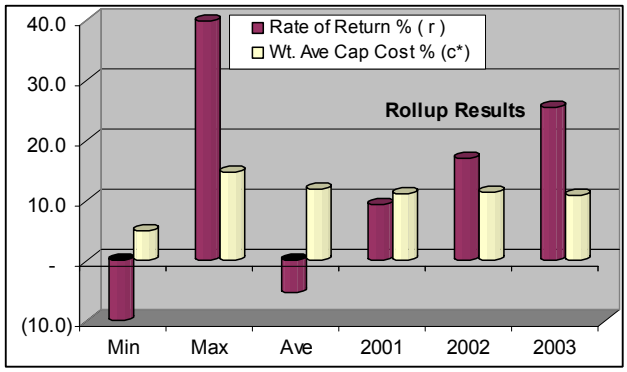


Figure 38: Rate of Return % and Cost of Capital %

Many companies that report Economic Value Added results in their annual report don't bother calculating a weighted average cost of capital but instead assume and use 12%. Minimum, maximum and average values for participating companies range widely from 5% to 17.71% with an average of 12.02%.

Rate of Return Index

Rate of Return Index is Rate of Return % on Capital divided by Weighted Average Cost of Capital %. A value less than 1.0 indicates the business is not generating sufficient profit to cover the interest cost of capital employed. The desired value for superior performance is an index of 2.0 or better. 2003 recycling company benchmark is 2.33 reflecting very much improvement over 2001 and 2002.

Negative values and very large values are problematic and reflect the need for improvement as noted for NOPAT % above and previously in the profitability and asset utilization sections.

OTHER RETURNS

Banks, lending institutions and investors routinely review other indicators of performance such as the ones included below, Figures 39 - 41. Higher values tend be favorable and reflect returns on assets, equity and earnings investment. Individual benchmarks will be listed but the reader is referred back to the discussions on profitability, asset utilization and debt & equity. These returns are not managed directly but rather through components used to calculate the return value.

Various benchmarks for return on equity are presented in the benchmark Figures 40 & 41, but are not discussed. Focus on the guidance in the debt to equity report section to maximize returns on equity.

RONA %

RONA % is Return on Net Asset %, which is the result of multiplying Net Profit % times Activity measure previously described. **2003 benchmark is 22.73%** which is in the superior performance range. Note the marked improvement over the previous two years, Figure 39.

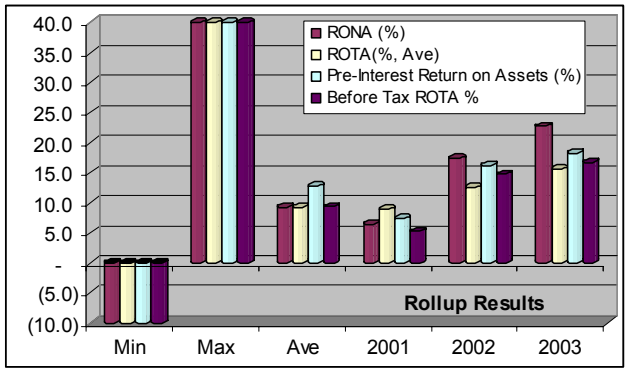


Figure 39: Returns on Assets

ROTA % (Ave)

Return on Total Assets % (Ave) is based on the average of opening and closing total assets. **2003 benchmark is 15.57%.**

Pre-Interest Return on Assets %

This measure is EBIT profitability returns on total assets expressed as a percent. **2003 benchmark value is 18.23 %.** For some lending institutions, this is the preferred measure for return on assets.

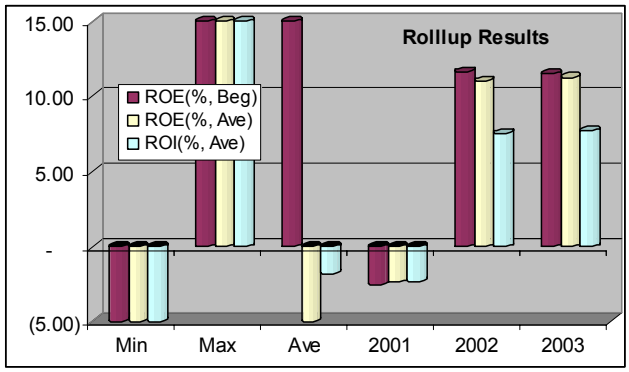


Figure 40: Returns on Equity & Investment

Before Tax ROTA %

Another point for measuring return on assets is the before tax profitability divided by total assets and expressed as percent value. **2003 benchmark is 16.69 %** and is sometimes the preferred measure for return on assets in like manner to the Pre-Interest Return on Assets %.

Figure 41: Other Returns Table

Other Returns	Min	Max	Ave	2001	2002	2003
RONA (%)	(75.25)	99.22	9.24	6.45	17.41	22.73
ROE(%, Beg)	(621.97)	5,754.72	186.46	(2.58)	11.62	11.45
ROE(%, Ave)	(1,881.00)	294.79	(43.66)	(2.40)	11.00	11.20
ROI(%, Ave)	(67.81)	55.23	(1.84)	(2.29)	7.50	7.59
ROTA(%, Ave)	(146.23)	94.78	9.24	8.94	12.52	15.57
Pre-Interest Return on Assets (%)	(43.42)	84.89	12.75	7.33	16.21	18.23
Before Tax ROTA %	(73.11)	84.86	9.32	5.22	14.72	16.69
B4 Tax Return on Tang Equity %	(377.92)	125.58	17.05	10.16	28.32	35.88

MILLION DOLLAR QUEST

Recycling company data confidentiality was critical for most of the participants in this benchmarking project. In fact many that indicated initial desire to participate later declined because of their concern that, in spite of all precautions, their data would somehow be compromised. Presenting data in the form of percentages and ratios inherently protects confidential source data. The disadvantage is loss of context and potential meaning for some of the data as well as an incomplete picture.

To address the context issue and provide confidentiality protection a "normalized" statement of financial performance and benchmark was derived. This was accomplished by rolling all participating company data up into one "super" company then dividing the result and adjusting to $1,000,000 net revenue along with a few other key modifications to protect company confidentiality. All benchmark ratios, percentages and performance data remain unchanged and is the same as presented in previous sections of this report.

All computations were made in AMPros Corporation's Profitizer! ™, a tool used since 1996 to assess and provide improvement guidance to a range of privately held companies. The output is a printout shown below, Figure 42, and on subsequent pages that puts financial statements into a flow chart structure with all components presented on a single page. Numerous performance ratios though not all are included in this presentation.

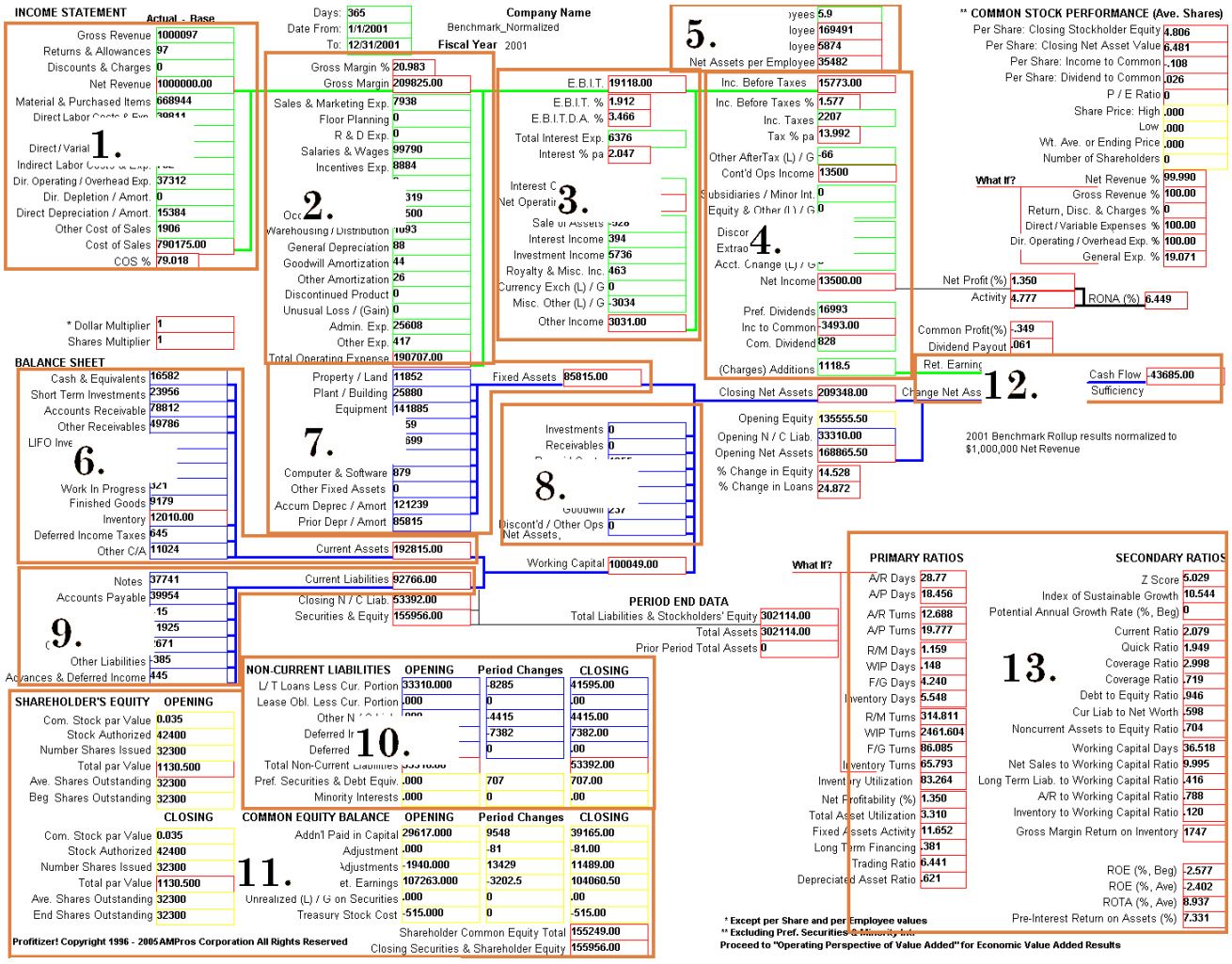


Figure 42: Profitizer! Form Layout Key

Data flows from left to right and top to bottom. Green segments represent the income statement, blue is the balance sheet asset and liability components and yellow is shareholder equity. Red boxes are computed

results. Numbered regions are briefly described and represent the general flow of data input and calculation. Data from each company financial statement is summarized to one of the green, blue or yellow boxes corresponding to the relevant company financial statement accounts.

One challenge for this or any similar benchmarking effort is that companies structure their financial statements differently even though they may be doing exactly the same thing business-wise as another company. It was necessary to move some accounts from one portion of the company financial statement to another to achieve an apples to apples comparison. Primary changes involved moving direct labor related and depreciation costs & expenses from the general & administration section to cost of sales. While not perfect, the summary result was a common structure and content for developing the benchmark results. A brief description of changes and consolidation of accounts is presented below corresponding to each numbered section above.

Income Statement

1. Revenue & Cost of Sales is the first data region starting with Gross Revenue. All reported sources of revenue were summed to the value entered in gross revenue with the exception of non-operating income. For instance, grants received were placed into Other Income. The major summary action in cost of sales was to include direct labor and related expenses along with fixed asset depreciation. Purchased materials, rebates to customers and contracted services were all placed in the "Material & Purchased Items" category. Failure to make these adjustments would have resulted in results that would not have been comparable and would be misleading. In general, companies provided sufficient information to enable these summarization actions or telephones calls were placed to get clarification as to account content and meaning.

2. Selling, General & Administrative Expense is reported in this section with the adjustments noted above. All itemized accounts, such as selling expense, were entered into the corresponding expense category minus any wage related expense. All remaining accounts were summarized to the "Admin" expense category.

3. Other Income & Expense, beginning with interest expense includes all non-operating income and expense account activity.

4. Income Taxes, Extraordinary Items & Distributions is reported in this section. Recycling companies exhibited a range of corporate structure and ownership. Some were "C" corporations, while most were sub-chapter "S", sole proprietor or some form of partnership. As such, income taxes and distributions vary considerably between companies. Income taxes were entered as reported, as were common dividends. Preferred dividends / distributions represents the payment to the business owners for personal tax liability or in some cases owners compensation. The net result is a reduction in retained earnings.

5. Employee Headcount is entered as Full Time Equivalent (FTE) headcount and used to calculate the revenue, assets and EBITDA per employee benchmarks.

Balance Sheet

6. Current Assets incorporate many accounts that include short-term investments, cash & equivalents and inventory as the major components. All trade receivables was summarized to Accounts Receivable while all other types of receivables were summed to Other Receivables.

7. Fixed Assets accounts include both the physical operating assets as well as improvements to those assets. For instance, leasehold improvements is included in the Plant / Building category along with the actual building value where applicable. Not all recycling companies own the building in which they are located. Fixed Assets is gross assets total less accumulated depreciation and amortization.

8. Other Non-current Assets include categories for both tangible and intangible assets that are not actively involved in the production of the business products and services.

9. Current Liabilities include accounts payable and other liabilities due or expected to be paid within 12 months or one operating cycle. Many companies operate on strictly a cash basis and often had no current

liabilities. A few reported substantial negative current liabilities, which generally was a misunderstanding of how certain current liabilities, such as payment due a shareholder, should be recorded. Correction or adjustments were made where appropriate.

10. Non-current Liabilities, Preferred Securities & Debt Equivalents, and Minority Interests are reported here and all are treated as a liability. This was done for consistency since both preferred securities and minority interests typically are not available as equity to the common shareholder. Few companies actually issued preferred shares.

11. Owners' Equity includes common stock that may or may not have an assigned par value along with paid in additional capital and total retained earnings. Some companies have accounts for reconciling individual owners claims on company earnings and loans to the company. These were consolidated within the Other Adjustments category. One note to be made here and for non-current liabilities above is that "Opening" balances should equal prior period "Closing" balances. This was not always the case with individual companies and will not be the case for the "Rollup Benchmark" results presented in the next few pages. While the former situation should always have opening balance equal to prior period closing balances, the benchmark rollup for each fiscal period is comprised of varying mix and number of companies. Therefore, it is not appropriate to force opening and closing balances between fiscal periods to be the same for these benchmark results.

12. Cash Flow Sufficiency is computed automatically and reflects the ability of the company to pay for changes in overall assets with retained earnings. A negative value means that a company must obtain additional funding from debt or equity placement in order to pay for the increase in assets. This is often the situation for a rapidly growing company and is not necessarily a problem since it is often appropriate to leverage growth. However, sometimes companies fall into the trap of borrowing to fund working capital because of poor receivables, high inventory or inability to meet current liabilities. Refer to the discussion in both the Cash Management and Working Capital sections of this report for further benchmark guidelines.

Performance Measures

13. Primary and Secondary Performance Ratios are presented in this section but is not inclusive of all benchmark and measures presented in this report. These data are calculated automatically as the financial information is entered into the appropriate section enumerated above. Manage performance to the "Primary Ratio" guidance and the "Secondary Ratio" benchmarks will be achieved.

Comparing Performance

Actual "Rollup Results" conforming to the Profitizer! ™ layout discussed above is presented on the following pages where the combined statements from all participating recycling companies is normalized to $1,000,000 net revenue. The performance measures are unchanged from the benchmark or "Rollup Results" presented previously other than perhaps a slight difference due to round off error. Fiscal year results for 2001, 2002 & 2003 are presented separately, Figures 43 - 45.

Compare your individual company performance to the results below. For each $1,000,000 in net revenue, ask if it took more or less people for your company? If it took less, your performance is likely superior to this composite benchmark or your product has a higher intrinsic value. Further, compare the contributions to cost of sales as well as selling, general and administrative expenses. Did your company incur greater or lesser costs and expenses to generate comparable profitability and asset utilization performance? Look at the totals for cost of sales and expenses, if these are in line with what you wish to achieve then re-distribute the individual costs and expenses to satisfy individual business requirements.

An example forecast for performance improvement is presented as the final "normalized" exhibit, Figure 46. The forecast result was accomplished using AMPros Corporation's Profitizer! ™ to project the 2003 Benchmark performance to improved performance. The focus was on improving earnings by reducing cost of sales and SG&A expenses while providing 5% wage and payroll tax increases. A brief description of parameters used is included on the forecast printout.

Figure 43: 2001 Benchmark performance normalized to $1,000,000 Revenue

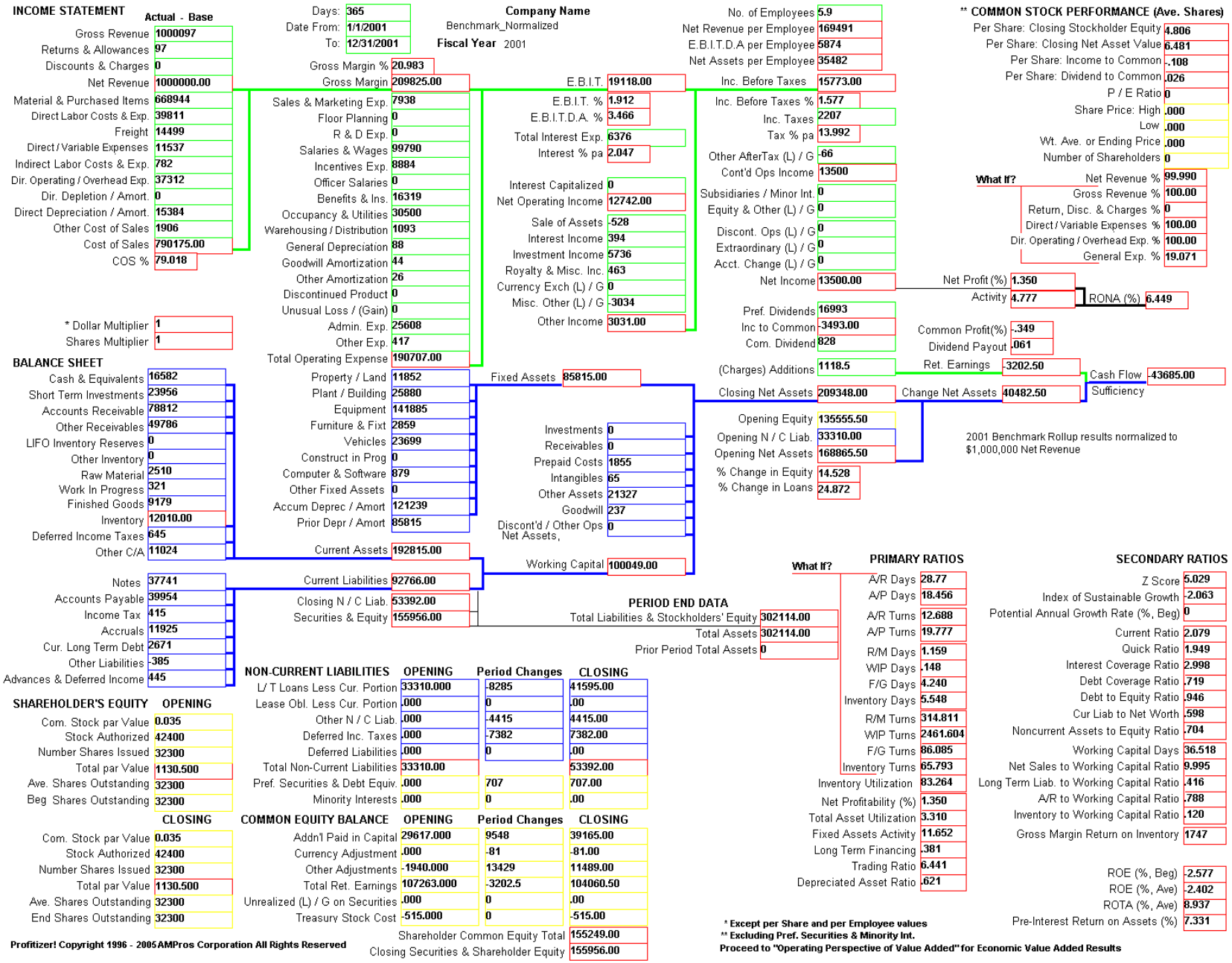


Figure 44: 2002 Benchmark performance normalized to $1,000,000 Revenue

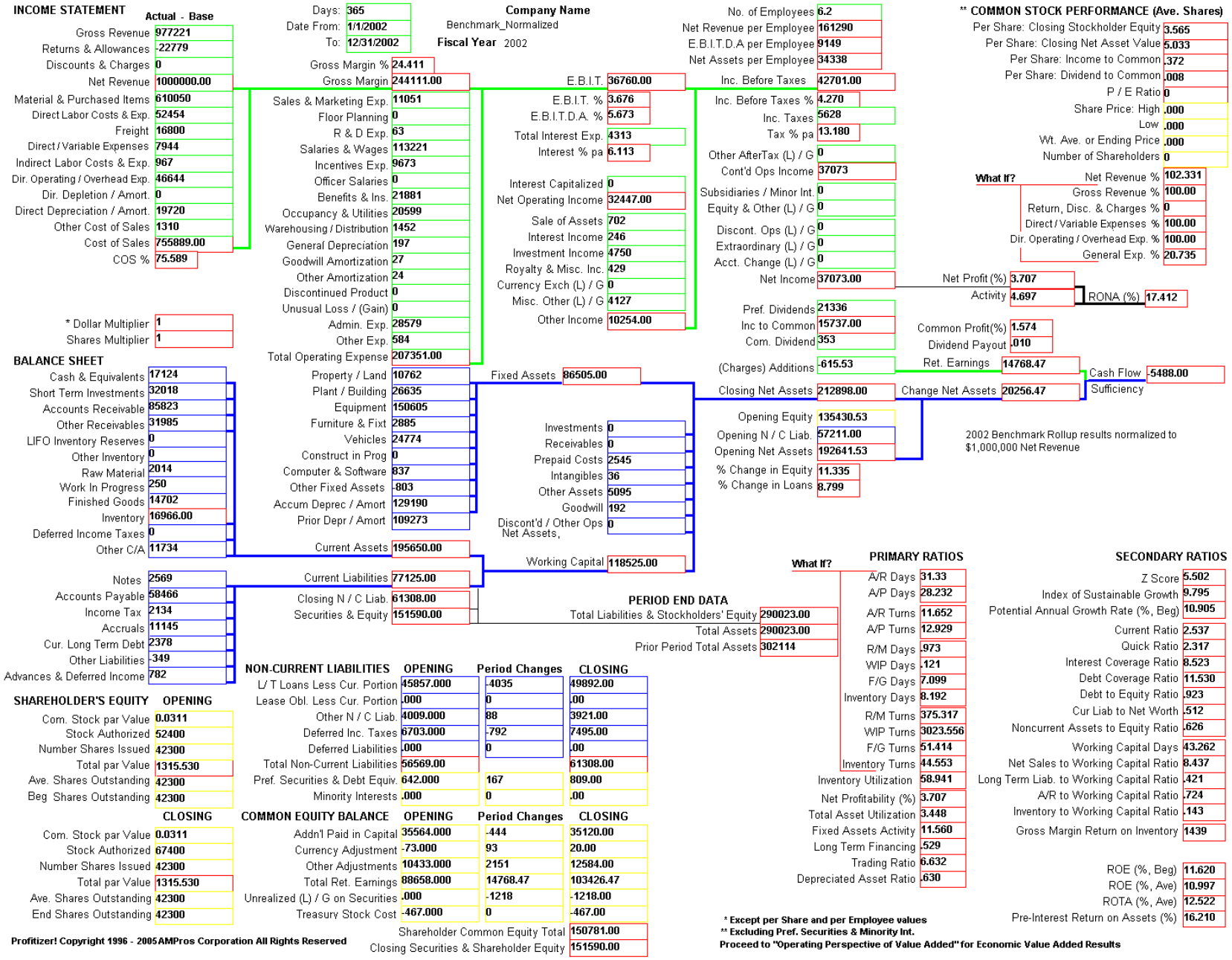


Figure 45: 2003 Benchmark performance normalized to $1,000,000 Revenue

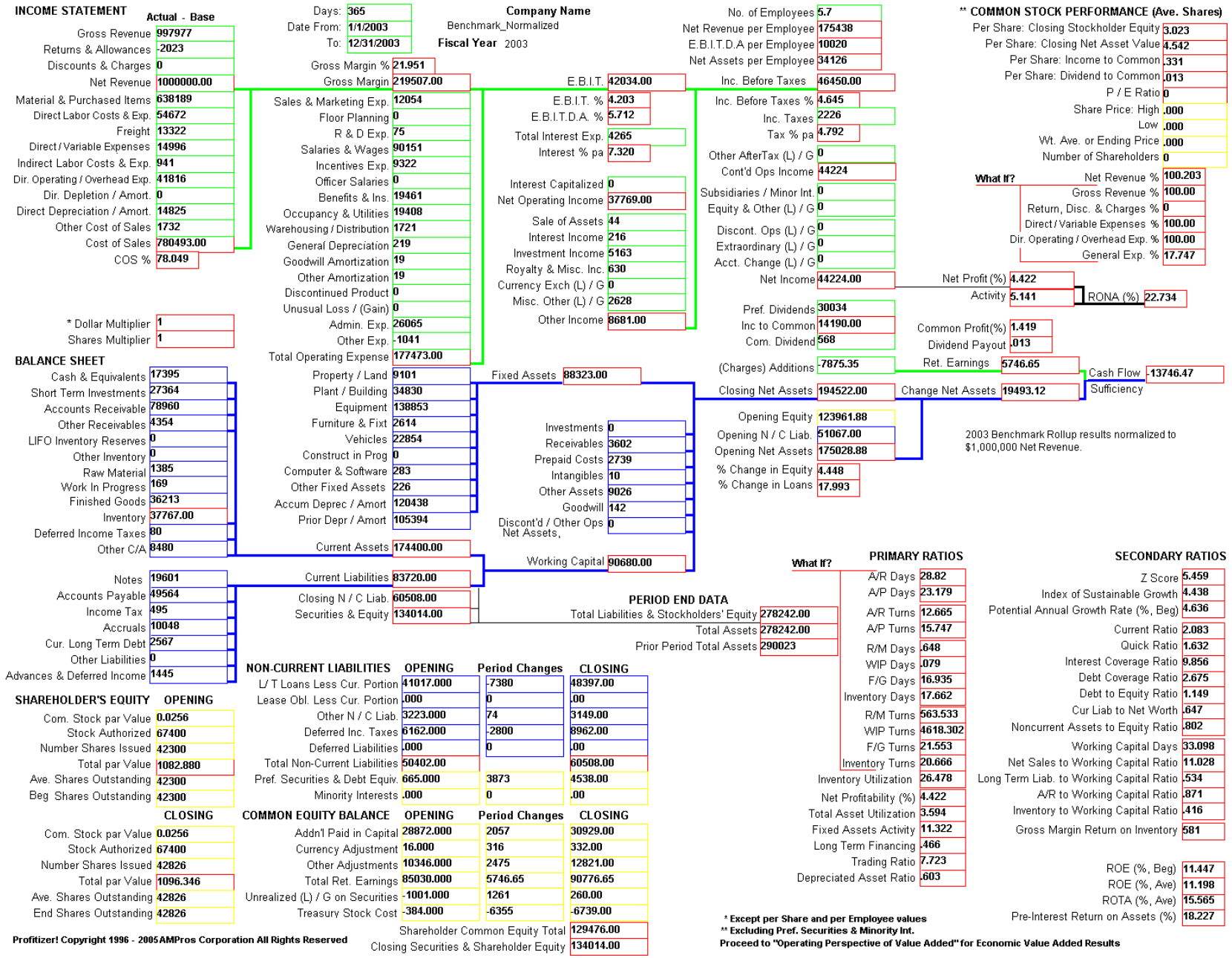
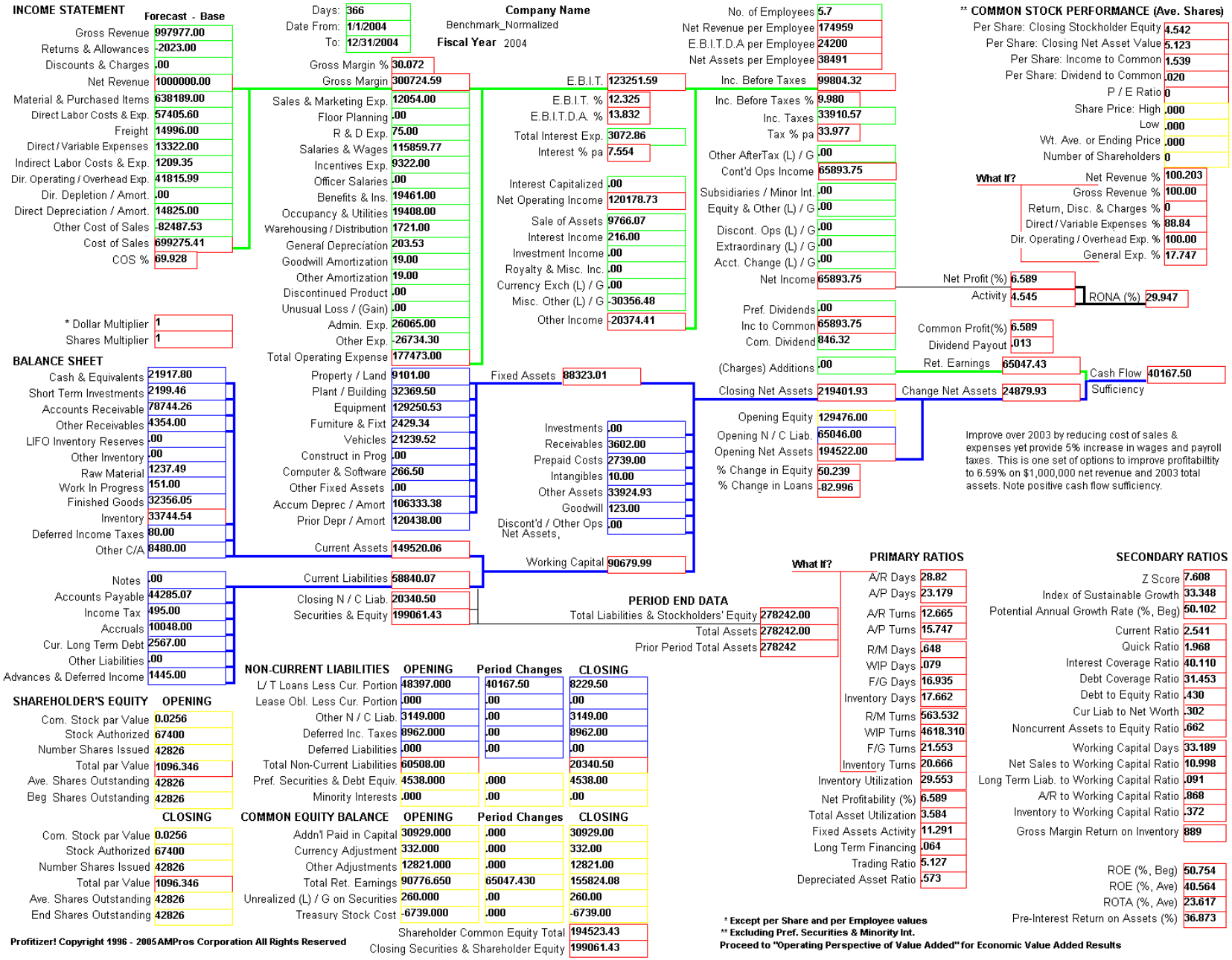
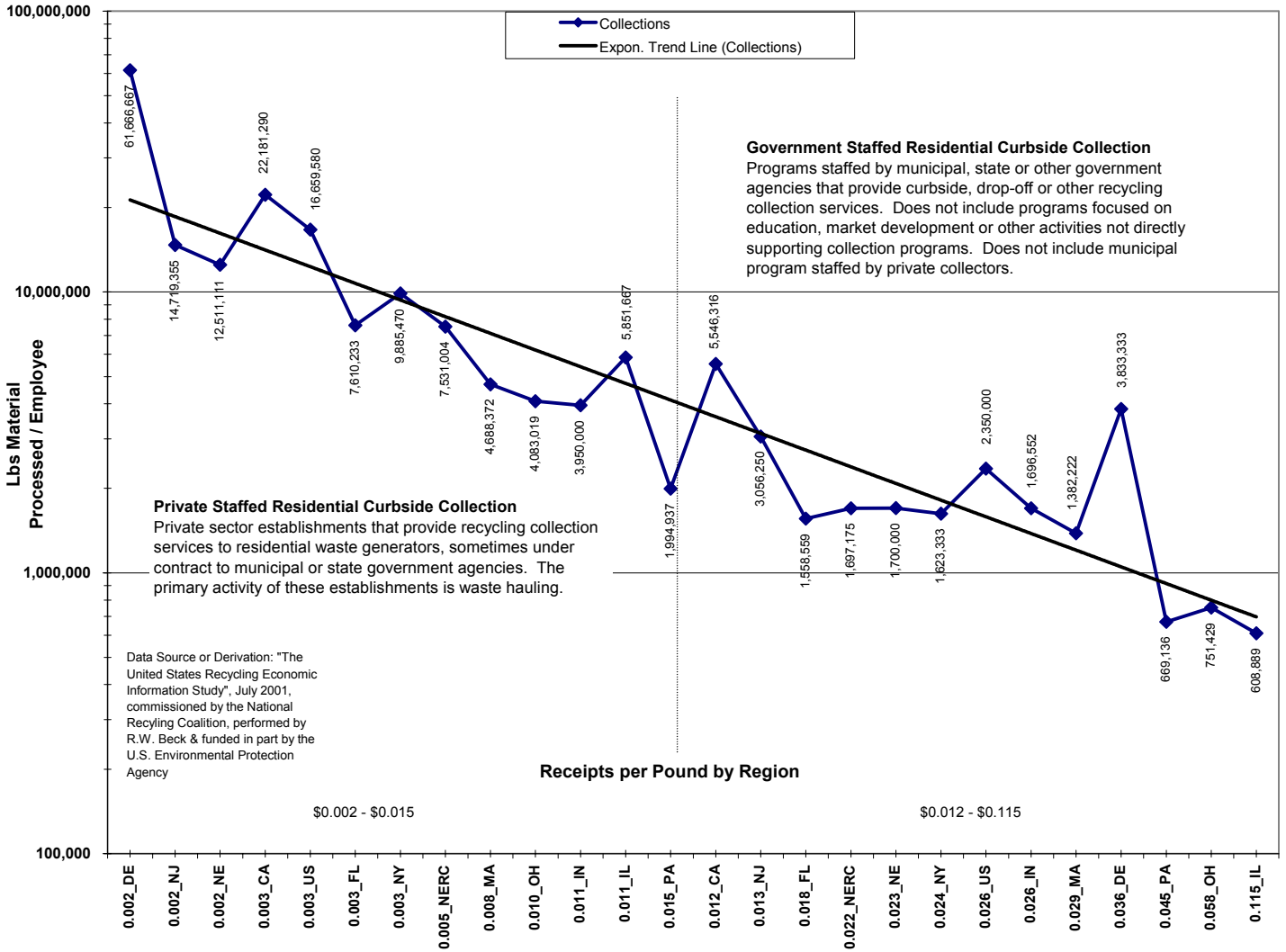


Figure 46: Projected Benchmark performance Improvement normalized to $1,000,000 Revenue



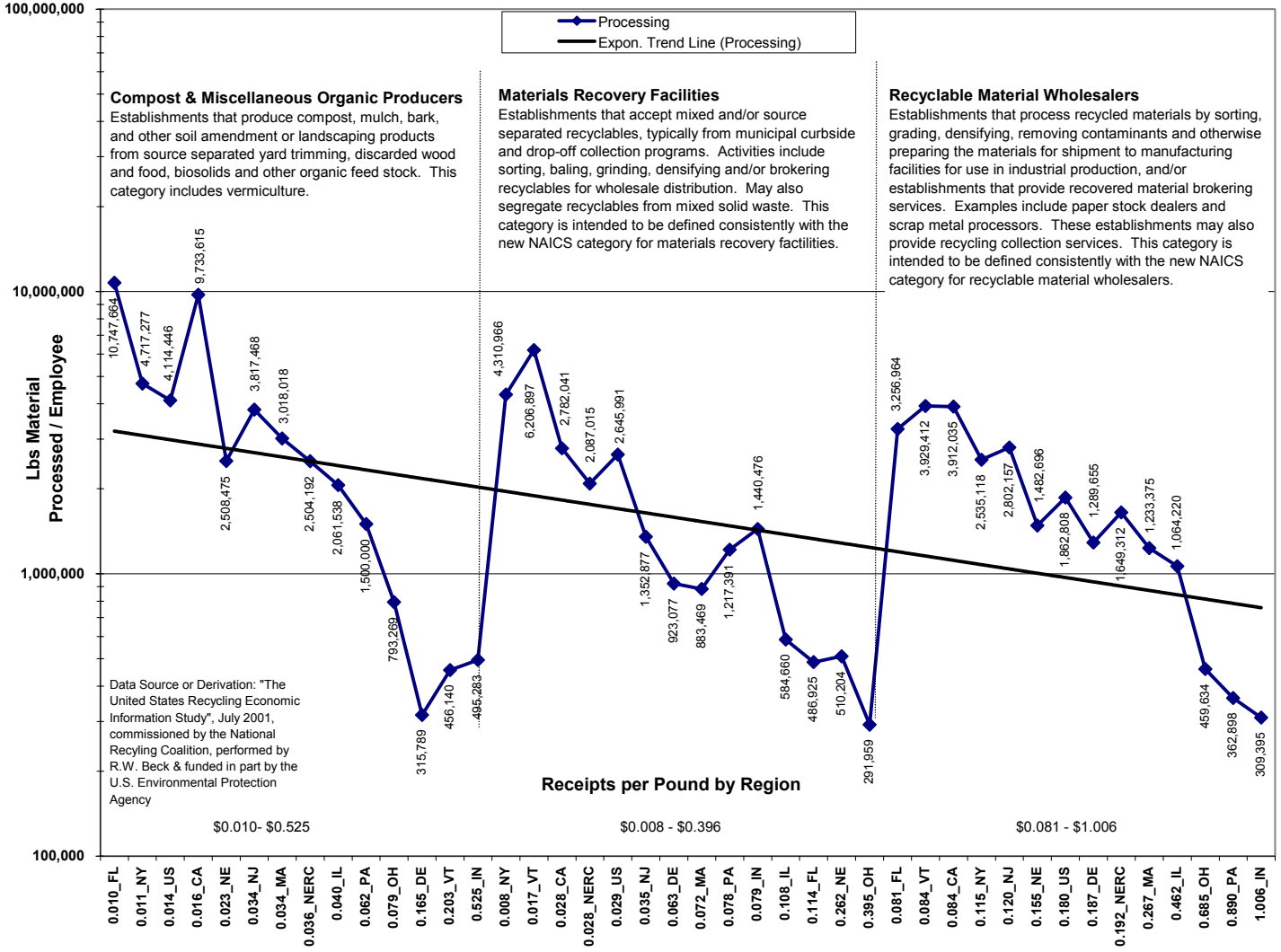
APPENDIX A – Derived Performance Data: REI 2001 Report

Recycling Collections performance benchmark for material amount processed per employee versus sales dollar realized per pound. Note that revenue per pound varies by state or region but follows the trend that high volume is associated with lower revenue per pound and low volume typically realizes higher revenue for equivalent weight of material. Business economics dictate that for a given recycling process, pricing must be sufficiently high for the volume processed in order to be profitable and remain a viable business. Intrinsic value of the material being recycled is a key driver for the price that can be charged for a given recycling segment product or service.



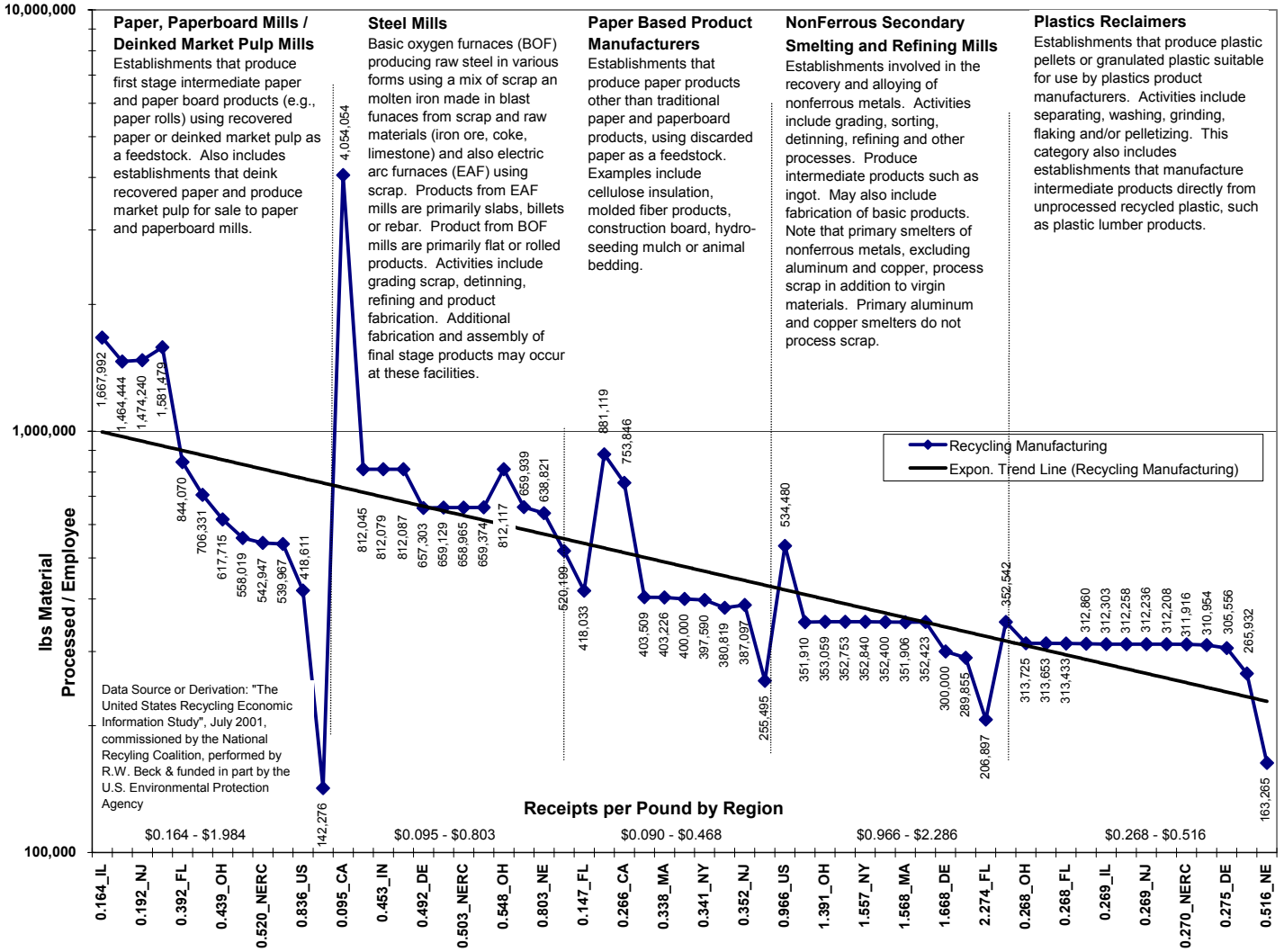
Recycling Processing performance benchmark for material amount processed per employee versus sales dollar realized per pound. This segment is comprised of Compost & Miscellaneous Organic Producers, Materials Recovery Facilities & Recyclable Material Wholesalers.

Note that revenue per pound varies by state or region but follows the trend that high volume is associated with lower revenue per pound and low volume typically realizes higher revenue for equivalent weight of material. Business economics dictate that for a given recycling process, pricing must be sufficiently high for the volume processed in order to be profitable and remain a viable business. Intrinsic value of the material being recycled is a key driver for the price that can be charged for a given recycling segment product or service.



Recycling Manufacturing performance benchmark for material amount processed per employee versus sales dollar realized per pound. This recycling segment is includes of Paper, Paperboard Mills / Deinked Market Pulp Mills, Steel Mills, Paper Based Product Manufacturers, Non-Ferrous Smelting and Refining Mills and Plastics Reclaimers.

Note that revenue per pound varies by state or region but follows the trend that high volume is associated with lower revenue per pound and low volume typically realizes higher revenue for equivalent weight of material. Business economics dictate that for a given recycling process, pricing must be sufficiently high for the volume processed in order to be profitable and remain a viable business. Intrinsic value of the material being recycled is a key driver for the price that can be charged for a given recycling segment product or service.



APPENDIX B – BENCHMARK DATA REQUEST

FINANCIAL & OPERATIONAL PERFORMANCE BENCHMARK

Request for Information:

Business Name _____

Address1 _____

Address2 _____

City _____ **County or Province** _____ **State**_____

Contact Person* _____

***Telephone1** _____ **Telephone2** _____ **Fax Number** _____

***Email Address** _____ **Web Site** _____

***Other Contact Information** _____

Check List of Required Financial and Operations Information:

- ❑ **Financial Reports for fiscal periods 2003, 2002 and 2001** (Preferably in electronic spread sheet or Access database format)
- ❑ **Accountants notes to each Financial Report Period**
- ❑ **Descriptive Chart of Accounts**
- ❑ **NAICS Classification** _____ or **SIC Code** _____
- ❑ **Number of Facilities Included within Financial Reports** _____
- ❑ **List Number of Facilities by State** _____

FIRM TYPE:

Which firm type(s) best describe your business?	**Percent by Firm Type & Fiscal Period**					
What is each type contribution & asset usage?	***% Revenue Contribution***			**% of Total Assets Used**		
Check all Firm Types that Apply	**2001**	**2002**	**2003**	**2001**	**2002**	**2003**
❑ **Broker**						
❑ **Manufacturer / End User**						
❑ **Processor**						
❑ **Material Recovery or Recycling Facility**						
❑ **Hauler**						
❑ **Wholesale Distributor**						
❑ **Retail Distributor**						
❑ **Manufacturer Representative**						
❑ **Direct Consumer Sales**						
❑ **Other**						

(Over please, continued on back of page)

EMPLOYMENT as FULL TIME EQUIVALENT (FTE):

Treat 1 FTE as equal to one person working full time for a full year regardless of whether temporary, part time or full time employment. That is, two people working ½ time for the full year is equal to 1 FTE.	**FY 2001**	**FY 2002**	**FY 2003**
Direct Labor:			
Indirect Labor / Support to Direct Labor:			
Management & Administrative:			
Total FTE			

MATERIAL RECYCLED / PROCESSED THROUGH BUSINESS OPERATIONS:

Provide breakout of material by category and approximate weight processed or handled that ultimately results in generating revenue.	**Material Processed or Handled or Sold as Product**		
	Weight per Year (specify wt units)		
Material Category	**2001**	**2002**	**2003**
Agricultural products			
Bulbs, Lamps, Ballasts			
Chemicals			
Computers & other Electronic Appliances			
Construction & Demolition Debris			
Glass			
Industrial Materials			
Metals			
Miscellaneous			
Motor Vehicle Items			
Organic Materials & Wood Waste			
Other (specify)			
Paper			
Plastic and Rubber			
Textiles and Leather			
TOTAL WEIGHT per Year			

Please send the requested information to:

Dan Hauschild

AMPros Corporation

P.O. Box 1145

Maple Grove, MN 55311-6145

Or email along with financial statement information to amproscorp@comcast.net

QUESTIONS AND ANSWERS

***Q*. Why is the recycling industry financial and operational performance benchmark project being conducted?**

A. Minnesota Office of Environmental Assistance (OEA) funded a series of recycling company business assessments that included financial evaluation and comparison. The study found that there was no industry data available for comparison or to support loans and investor participation. The benchmark is intended to provide consolidated industry data to mainstream the recycling industry. MN, IA, OH, WI, IL, MI, the U.S. EPA, and the Minnesota Banker's Association support the project.

***Q*. You are asking for financial and operating data that is company confidential. Who will see this information?**

A. The information you send will be kept strictly confidential and will not be provided to any government agency. Only AMPros Corporation, the company assigned to carry out the project tasks, will view the individual company financial and operating information. Individual Company information will be consolidated into various groupings and only the performance and benchmark results that are consolidated into the final benchmark statistics will be shared with all participants.

***Q*. How will the project benefit my company?**

A. You will receive a final report containing the composite results from all participants. Plus, you will receive your company's individual performance results with an assessment of how you compare to the overall industry performance. Also included, will be an explanation of what the results mean.

The information will be useful in a number of ways, including identifying internal improvement needs, establishing business & strategic goals, loan application and investor discussions. Companies planning to expand, diversify or sell will find the benchmarks useful in marketing the business strengths.

The project establishes a baseline for performance benchmarking. If your business is not the top performing company then you have a target for moving to improved competitive and profitability position.

***Q*. Why are three years of financial information required?**

A. There are several reasons including establishing individual company performance and industry trends, making sure we have comparable period financial and operating information, and establishing a firm performance baseline. Not every company has the same fiscal period so it is important that we bridge the differences.

***Q*. Why do you need accountants notes and descriptive chart of accounts?**

A. Financial numbers alone can be interpreted out of context. Plus experience has shown that not all accountants report financial activity in the same manner. Many terms can be used to describe the same transaction. As such, we need a means to interpret the financial reports and assure that the project delivers quality results firmly rooted in consistent interpretation of information you provide.

***Q*. Why are you asking for facility count and location by state?**

A. This is multi-state project, and it is recognized that larger companies may have more than one recycling operation. By providing the requested information, you are helping to better describe the recycling industry

and also giving a potential basis for initiating government agency support in critical areas of need. We are not asking you to break financial reports into individual facility financials, this is complex for both you and the project. It would be helpful, however, if you provided supplementary information as to the number of full time equivalent employees at each facility.

***Q*. What will "Firm Type", "Revenue Contribution" and "Total Assets Used" be used for and why is it important?**

A. We need a means to identify common characteristics that can be used to group performance results. The "Firm Type" listed are common to the recycling industry across multiple states and provides one potential means to group results. Other means commonly used to classify or group similar companies are revenue and assets. The combination of these three pieces of information gives a multi-perspective view of the recycling industry.

***Q*. How does providing "Employment" data contribute to project results?**

A. It will help explain project results and provide benchmarks for productivity. It is well recognized that certain firm types require more people to perform critical operations while others may be more automated. The difference in employment may simply be an industry segment characteristic or it may represent why one company is successful and another is not.

***Q*. Explain the request for "Material Category" information.**

A. The potential number of products or uses of items produced from recycled materials is almost unlimited and thus more than can be accommodated in the scope of the current project. However, there is a common thread regardless of "Firm Type". That thread is the nature of the materials being recycled. "Material Category" is a summary list of all the specific materials that are recycled yet reduced to a manageable list for this project. The "Weight per Year" will be used to help establish the relative importance and contribution of each "Material Category" to overall recycling industry health and success.

***Q*. Where should I send my company information?**

A. Please send the requested information to the following address:

Dan Hauschild

AMPros Corporation

P.O. Box 1145

Maple Grove, MN 55311-6145

Minnesota Office of **Environmental Assistance**

www.moea.state.mn.us

RE: Recycling Industry Benchmarking & Performance Measurement

Dear Recycler:

You are invited to participate in an exciting project that has enormous potential to benefit your company.

- **YOU'LL RECEIVE:** A performance assessment to help you improve your business' competitive strategy. Potential investors will receive a benchmark derived from consolidated industry data, providing them with informed incentive to invest in companies like yours.

- **FREE:** There is no cost to you. Your participation only requires a small amount of time to pull together and submit information you already have from normal business operations.

- **CONFIDENTIAL:** ***All information will be kept strictly confidential and is protected under Data Privacy regulations.***

- **HOW TO PARTICIPATE:** Fill out the enclosed post card and return by the date shown on the post card. Or, contact me at (800) 657-3843. You may also email me at tina.patton@moea.state.mn.us.

For more information, please read the enclosed brochure describing the project and outlining the benefits available to you.

I hope that you will take this unique opportunity to make a positive difference in the recycling industry while strengthening your own business.

Sincerely,

Tina D. Patton
Market Development Specialist

520 Lafayette Rd. N. | 2nd Floor | St. Paul, MN 55155-4100 | Eight regional offices | 651-296-3417 | toll-free 800-657-3843 | fax 651-215-0246

About the **Minnesota Office of Environmental Assistance (MOEA)**

The MOEA is a non-regulatory state agency that provides financial and technical assistance to recycling companies. MOEA has identified the need for recycling industry performance benchmarks as a result of its commitments, assessments and support of recycling businesses throughout the region. This project is managed by MOEA with support from other state and federal agencies.

About **Ampros Corporation**

AMPros Corporation is a business management company founded in 1993 and dedicated to assisting businesses in becoming more profitable and competitive. AMPros has been selected as the firm charged with receiving all participating company information carrying out the project tasks and maintaining confidentiality for all project participant company data.

Don't take our word for it.

From companies that have received the service:

"The assessment has been extremely helpful and I would recommend it to any business."
— Thomas R. Gujer, CFO, Asset Recovery Corporation

"I would not hesitate for a moment to utilize, or recommend, [Ampros Corp.] again for any marketing or financial consulting projects I might have, or others might be contemplating."
— Steve Porter, President, Recycled Plastics, Inc.

"Knowing what we now know, if we were asked to pay for this assessment, we would have without hesitation."
— Gordon W. Cell, President and CEO, Hi-Tek Rubber, Inc.

Minnesota Office of **Environmental Assistance**

Tina Patton, Project Manager
800-657-3843
tina.patton@moea.state.mn.us

520 Lafayette Rd N.
2nd Floor
ATTN: Tina Patton
St. Paul, MN 55155-4100

www.moea.state.mn.us

Recycling Industry Benchmarking and Performance Measurement

A voluntary, free, and confidential service available for a limited time.

Minnesota Office of **Environmental Assistance**

The project

The project will develop financial and operating performance benchmarks for the recycling industry. It is supported by MN, OH, MI, IL, IA, IN, WI, and recycling and banking associations, and funded by the **U.S. Environmental Protection Agency.**

Risk and performance management information for recycling companies is not currently available, making it difficult for companies like yours to attract investors, secure loans and achieve profitable performance comparable to the best of companies in the recycling industry.

FREE

There is no cost except for the small amount of your time required to pull together and submit information you already have from normal business operations.

CONFIDENTIAL

Your business information is held completely in confidence. Financial and operating information will be kept strictly confidential and is protected by data privacy regulations.

Thriving or just surviving?

If your Z-Score is less than 3.0, it is highly likely you will be out of business within two years.

Want to know what to do about it?

Profits do not equal cash.

Many seemingly profitable companies slowly bleed to death for lack of cash. Are you one of them?

What does cash flow sufficiency tell you about your business needs?

Opportunity abounds — sustainable growth does not.

The vision is in place and you are busier than ever. But you can't seem to move ahead – why?

Would you like some answers?

Is your business performing?

Recycling is a volume driven, value added game. Do you have the mix of assets, people and resources to compete at top levels of business performance? Do you know when you have "arrived" compared to peers, competitors and partners?

Would you like to know how your company compares to the industry?

Money matters.

Most companies need money to start a business or expand — or in some cases just to survive. Banks, investors and partners want to know your plan and how you compare to the marketplace in which you compete.

Do you want investors interested in your company?

GET ANSWERS

Large, small or somewhere in between, your company size does not matter. Get some answers by participating in the **Recycling Industry Benchmarking and Performance** project.

HOW TO PARTICIPATE

Return the enclosed post card by the indicated date.

Or call today to reserve your place.

Contact:

Tina Patton, Project Manager
Minnesota Office of Environmental Assistance
800-657-3843
Email: **tina.patton@moea.state.mn.us**

or

Dan Hauschild, President AMPros Corp
763-553-2028
Email: **amproscorp@comcast.net**

NOTHING TO LOSE

This is a free service being offered to a limited number of participating companies. Call or email now to reserve your place.