



Implementation of the School Diversion and Environmental Education Law

Report to the Legislature

September 2005

STATE OF CALIFORNIA

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Executive Summary

[Senate Bill \(SB\) 373](#) (Torlakson, Chapter 926, Statutes of 2001), required the California Integrated Waste Management Board (CIWMB) to create an Environmental Ambassador Pilot Program (EAPP) and a unified education strategy (UES) for schools and school districts. In addition, the legislation established the CIWMB's Office of Integrated Environmental Education that was subsequently renamed the Office of Education and the Environment (OEE) by Assembly Bill 1548 (Pavley, Chapter 665, Statutes of 2003). SB 373 also required OEE to report to the Governor and the Legislature on the results of the EAPP and the implementation of the UES.

Throughout the entire process of developing the EAPP and the UES, significant parallel and overlapping activities have occurred. To gain full appreciation for both of these programs, they should be reviewed together. As such, this report is a combination of two separate reports detailing the findings of the Environmental Ambassador Program and the unified education strategy.

Legislative Intent

Referred to as the "School Diversion and Environmental Education Law" (School DEEL), SB 373 contains broad requirements to integrate the environment into standards-based education in the state's K-12 classrooms as part of a unified education strategy. The intent of the legislation was two-fold: (1) To develop a unified education strategy to integrate environmental concepts into K-12 standards-based education and (2) To increase the presence of resource management programs, such as waste reduction, recycling, composting, and other resource conservation programs, on school district campuses statewide. Through grants, training, ongoing technical assistance, and the identification of model programs and tools, SB 373 will be able to engage pupil participation in campus conservation efforts so as to promote student achievement and resource conservation at the same time.

Environmental Ambassador Pilot Program

The Environmental Ambassador Pilot Program was created to assist schools with established environmental programs. Grant funds enabled school districts to design and expand sustainable elementary and secondary school environment-based education and resource conservation programs. Through the documentation of replicable education and waste diversion programs, these school district programs are intended to serve as models for schools that have yet to establish their own programs.

Six pilot districts were selected through a non-competitive grant process in the fall of 2002. The selected districts were eligible for two-year grants at a maximum funding level of \$90,000. These grants focused on developing and documenting replicable education and resource conservation activities, as well as mentoring school districts that are developing new education and resource conservation programs.

Baseline waste diversion studies (referred to in this report as "pre-assessments") were subsequently conducted for each EAPP district by CIWMB staff in the spring of 2003. Based on the results of those studies, CIWMB staff suggested opportunities to expand or create new diversion programs for the districts or their schools. From these recommendations, the districts selected the diversion programs that they were interested in implementing during the time of the EAPP.

Findings

It is too early yet to determine what effect any new waste diversion programs will have on disposal amounts for the EAPP's districts. Staff found that because many of the diversion programs had only begun in late 2004 or between January and June of 2005, not enough time had elapsed for any corresponding reduction in disposal amounts to be reflected in some of the districts' total annual disposal amounts. Some of these programs included increased recycling of white paper and/or cardboard, composting school lunch food waste on- or off-site, and setting up vermicomposting programs.

Even within this limited timeframe, staff found that three of the districts were able to reduce their disposal amounts as a result of implementing diversion programs during the grant period. Two of the other districts anticipate that another year of program implementation would result in reduced disposal tonnage and corresponding cost savings. For example, Eureka City Schools anticipates a large decrease in disposal through implementing a food waste diversion program in the 2005–06 school year.

In addition to realizing diversion achievements during the grant period, most of the EAPP districts were able to take a major step toward making their waste reduction programs sustainable over the long run by adopting a waste reduction policy. CIWMB staff has found that districts with such a policy are able to maintain waste diversion programs even when a key player such as a teacher or maintenance person responsible for a diversion program retires or transfers to another school. Other districts that did not adopt a policy made strides toward sustainability by (1) looking at ways of restructuring their disposal service contracts to include recycling service or (2) making plans to hire a staff person dedicated to finding ways for the district to increase diversion and reduce overall energy consumption.

Lessons Learned

Throughout the course of the study, there were many valuable lessons learned that could help to improve the program's overall effectiveness in the future. For instance, despite detailed expectations and summer institutes, some participants were unclear about their expectations and responsibilities as a member of the program. However, this problem seemed to be neutralized after the district designated an individual to act as a liaison between CIWMB staff, teachers, and administrators.

Given the complexity of the instructional units, CIWMB staff also found that some districts would have benefited by spending more time in the beginning establishing clear goals and responsibilities for each team player. Furthermore, the experience revealed the need for teachers to have full administrative support from supervisors and principals to ensure adequate implementation and development of the program.

Unified Education Strategy Pilot Program

In addition to the Environmental Ambassador Pilot Program, SB 373 required the CIWMB to provide grants to schools and school districts to assist in the development and implementation of educational pilot programs to teach source reduction, recycling, and composting as part of the unified education strategy. Unlike the EAPP applicants, the UES applicants were not required to demonstrate existing diversion or curricular activities related to waste diversion and conservation. The UES pilot program was designed to provide the district teams with a model for creating their own standards-based lessons using the context of a student-driven waste audit in their own classroom or campus.

Fourteen school districts were selected through a competitive process to receive funding and technical assistance to develop lesson plans for instructional activities that integrate teaching with waste diversion and resource conservation practices. The distribution of UES school grants took into account the geographic and socioeconomic diversity of California. These grants were awarded in two stages—a planning phase and an implementation phase. Grant awards for the first-year planning phase were for a maximum funding level of \$27,000. Once districts completed the goals of the first phase of the pilot, they were eligible to apply for grant awards for a second-year implementation phase. These grants were for a maximum funding level of \$38,000.

Findings

Many of the successful participants embraced a community approach by including representatives from their local government offices and non-governmental agencies as members of their extended team. Staff found that those districts with strong partnerships with the local jurisdiction's recycling coordinator were more successful in maintaining, expanding, and implementing new diversion programs.

The EIC Model™ (Environment as an Integrating Context for learning) that was adopted for this program is designed to build depth and sustainability of teaching practices in schools and teaching teams. As a requirement of the UES grants, each grantee produced model units which were submitted to the Office of Education (OEE) at the conclusion of the grant term. Some teachers expressed concern that the workload expected on the curriculum side was too great. One explanation for this concern is that the EIC Model™ instructional strategy is usually implemented over a five-year period, whereas the two-year grant allowed only a two-year period.

Lessons Learned

As a result of the fact that the grant amount for each district was set at a maximum of \$90,000, large districts were left with inadequate funding for program implementation. In retrospect, amounts funded should have been based on the size of the district, number of schools participating, and an assessment of existing infrastructure related to curriculum and diversion. Program sustainability will be difficult without a source of additional funding for most districts, although several districts are committed to continuing the programs with district funding.

While several of the districts chose to fully implement the EIC Model™ and were successful at developing their instructional programs, the model was not a good fit for all participants. This can be attributed to the fact that the model is intended for use as a school reform strategy that requires a five-year implementation process. Attempting to compress implementation into just two years may have been the reason for some of the difficulties faced by teachers and administrators.

Recommendations

The following recommendations were formulated from the findings and experiences of CIWMB staff and program participants.

Professional Development: CIWMB should hold regional workshops to explain and disseminate training tools for schools, as funding and resources permit. This would be more cost-effective than working with individual schools and would enable more districts to incorporate the components of the program into their curriculum.

Technical Assistance: CIWMB staff should continue to assist districts/schools in identifying how to integrate resource conservation and waste diversion with their instructional programs. Future program participants should take time up front to plan various phases of the program in order to streamline the implementation process.

CIWMB Internal Program Development: The Office of Local Assistance and the Office of Education and the Environment staff should continue to develop coordinated internal communication strategies for an integrated diversion and environment-based education approach for school districts.

Introduction to School DEEL

[Senate Bill \(SB\) 373](#) (Torlakson, Chapter 926, Statutes of 2001), required the California Integrated Waste Management Board (CIWMB) to create an Environmental Ambassador Pilot Program (EAPP) and a unified education strategy (UES) for schools and school districts. In addition, the legislation established the CIWMB's Office of Integrated Environmental Education that was subsequently renamed the Office of Education and the Environment (OEE) by Assembly Bill 1548 (Pavley, Chapter 665, Statutes of 2003). SB 373 also required OEE to report to the Governor and the Legislature on the results of the EAPP and the implementation of the UES. The following report describes the efforts, findings, and recommendations of these programs.

The Environmental Ambassador Pilot Program was created to assist schools with established environmental programs. Grant funds enabled school districts to design and expand sustainable elementary and secondary school environment-based education and resource conservation programs. Through the documentation of replicable education and waste diversion programs, these school district programs are intended to serve as models for schools that have yet to establish their own programs. Ultimately, six school districts participated in the "two-year" (2003–04 and 2004–05 school years) program:

1. Burbank Unified School District
2. Desert Sands Unified School District
3. Eureka City Schools (serving as lead for Humboldt County Office of Education's Environmental Ambassador Pilot Program grant)
4. Oak Grove Union School District
5. San Juan Unified School District
6. Warner Unified School District

In addition to the Environmental Ambassador Pilot Program, SB 373 required the CIWMB to provide grants to schools and school districts to assist in the development and implementation of educational pilot programs to teach source reduction, recycling, and composting as part of the unified education strategy. Fourteen school districts were selected in a competitive process to receive funding and technical assistance to develop lesson plans for instructional activities that integrate teaching with waste diversion and resource conservation practices. The majority of these school districts fulfilled their two-year grant commitments. A few of the school districts chose not to apply for the second year of grant funding. One district chose, because of changes in personnel, not to accept the grant. The following schools were selected as UES grant partners:

Fulfilled Two-Year Grant Commitment

1. Belmont-Redwood Shores School District
2. Chico Unified School District
3. Etna Union Elementary School District
4. Los Angeles Unified School District
5. Mariposa County Unified School District
6. Pacific Unified School District

7. Petaluma City School District
8. San Carlos School District

Did Not Apply for Second Year of Grant Funding

1. Anderson Valley Unified School District
2. Beverly Hills Unified School District
3. Emery Unified School District
4. Hawthorne School District
5. Mare Island Technology (MIT) Academy Middle School

Did Not Accept Grant

1. Del Norte County Unified School District

The lessons learned from both the Environmental Ambassador Pilot Program and the UES pilot projects form the basis for developing and refining a statewide unified education strategy that will be used in schools throughout California. Both programs are described in detail in this report.

Therefore, instead of submitting two separate reports detailing the findings of the Environmental Ambassador Program and the unified education strategy, this report will describe both pilots and how they combine to create an overall strategy. The mandates set forth in SB 373 further the mission of the CIWMB by assisting schools in their efforts to establish a unified education strategy where academic endeavors, administrative support, and facilities management work collaboratively to conserve resources and enhance substantive learning opportunities.

Legislative Intent

The intent of SB 373 was two-fold: (1) To develop a unified education strategy to integrate environmental concepts into K–12 standards-based education and (2) To increase the presence of resource management programs, such as waste reduction, recycling, composting, and other resource conservation programs, on school district campuses statewide. Through grants, training, ongoing technical assistance, and the identification of model programs and tools, SB 373’s main purpose was to engage pupil participation in campus conservation efforts so as to promote student achievement and resource conservation at the same time.

Background

In September 2001, then-Governor Gray Davis signed SB 373 into law, creating a series of integrated waste management and environmental education mandates for the CIWMB. One of six boards, departments, and offices within the California Environmental Protection Agency (Cal/EPA), the CIWMB is guided by its mission to reduce waste, promote the management of all materials to their highest and best use, and protect public health and safety and the environment, in partnership with all Californians.

The legislation, referred to as the “School Diversion and Environmental Education Law” (School DEEL), contains broad requirements to integrate the environment into standards-based education in the state’s K–12 classrooms as part of a unified education strategy. The legislation sought to increase the presence of resource management programs, such as waste reduction, recycling, composting, and other resource conservation programs, on school district campuses statewide. The legislation contains several components, including:

- Development, implementation, and adoption of a unified education strategy on the environment for elementary and secondary schools in the state.
- Creation of the Environmental Ambassador Pilot Program.
- Distribution of grants to schools and school districts.
- Development of model education programs and school waste reduction tools for schools, school districts, county offices, and local agencies.
- Training and ongoing technical and information assistance for implementing waste reduction programs.
- Coordination of development, maintenance, and promotion of recycled-content materials and environmentally preferable products lists that may be used in the construction and modernization of public school facilities.
- Evaluation of the effects of school waste reduction plans and other resource conservation efforts in the state’s schools.
- Assessment of the impacts of the education programs on student achievement.

The principal goals of the unified education strategy, as described in the legislation^{*}, are as follows:

- “Coordinate instructional resources and strategies for providing active pupil participation with onsite conservation efforts.”
- “Promote service-learning opportunities between schools and local communities.”
- “Assess the impact to participating pupils of the unified education strategy on student achievement and resource conservation.”

SB 373 provided for the establishment of the Environmental Ambassador Pilot Program and a grant program to support and promote the integration of educational and diversion programs in schools. Additionally, it appropriated \$1.5 million dollars for the implementation of these programs. The Environmental Ambassador Pilot Program was intended to “facilitate the utilization of environmental education as a means to environmental action”[†] by supporting and expanding effective programs, as well as providing findings and results that would be used “to develop and further refine the unified education strategy...”[‡] SB 373 charged the OEE with launching and monitoring the Environmental Ambassador Pilot Program.

The grant program was established to provide schools and school districts with funds to assist in the development and implementation of programs “to teach the concepts of source reduction, recycling, and composting.”[§] Coordinated by OEE, grants were awarded by the CIWMB based on criteria developed in consultation with the California Department of Education (CDE), State Board of Education (SBE), and the Office of the Secretary of Education (OSE).

^{*} Public Resources Code (PRC) section 42603.

[†] Education Code section 51226.4 (c).

[‡] Education Code sections 51226.4 (d).

[§] Uncodified law from SB 373, section 6 (a).

The legislation also required the CIWMB to develop web-based models and school waste reduction tools for use by schools, school districts, county offices, and local agencies to implement waste reduction programs. The CIWMB was also to provide training and ongoing technical and information assistance to these entities with implementing waste reduction programs.

The CIWMB achieved these goals by supporting the Environmental Ambassador Pilot Program participants and UES grantees with a comprehensive support program that included the development and distribution of educational resource materials (see Resources section at end of this document) and in-depth professional development and technical assistance for teachers, school district administrators, school district business officials, and local waste management agencies.

Additionally, the CIWMB was to serve as consultant to the Division of the State Architect (DSA) as it develops and maintains lists of recycled-content materials and environmentally preferable products on its website. This information was to be made available to school districts and county offices of education as they select sustainable building materials to construct and modernize public school facilities.

Project Objectives

The objectives of the pilots as described in the legislation were as follows^{**} :

1. Develop sustainable elementary and secondary school programs for environmental systems and environmental science and technology, including school gardens using composted materials.
2. Coordinate instructional resources and strategies with on-site conservation efforts with active pupil participation, including energy audits and conservation.
3. Facilitate service-learning partnerships in which schools and communities work to provide real-world experiences to pupils in areas of the environment and resource conservation, including education projects developed and implemented by pupils to encourage others to utilize integrated waste management concepts.
4. To the extent feasible, assess the impact of the pilot programs on student achievement and resource conservation.

School DEEL and the Education and the Environment Initiative

The School DEEL established the foundation for development of what has become known as the Education and the Environment Initiative (EEI).^{††} Tenets of the School DEEL are incorporated in and further reinforced by the more recent law. The program mandated by the School DEEL helped school districts develop programs that connect resource management objectives, such as waste management, with service-learning and standards-based education. These district programs were supported so that they might serve as models for other school districts.

To date, the development and implementation of the unified education strategy defined by the School DEEL is being continued and strengthened through the efforts of EEI. The new law provides specific directives related to the coordination of efforts among State boards, offices, and

^{**} Education Code section 51226.4.

^{††} Assembly Bill (AB) 1548 (Pavley, Chapter 665, Statutes of 2003).

departments. The experience gained by CIWMB staff will support expanded efforts toward the integration of environment-based content in the K–12 education system in a manner that reflects both the needs of educators and the collaborative efforts called for in both the School DEEL and the Education and the Environment Initiative.

Project Team

A project team composed of staff from the CIWMB’s Office of Education and the Environment (OEE) and the Office of Local Assistance (OLA) and a team of consultants from The Acorn Group (TAG) and the State Education and Environment Roundtable (SEER) conducted the work of these projects. In addition, educators and community partners from 6 school districts participated in the Environmental Ambassador Pilot Program and educators from 13 school districts participated in the UES pilot project.

Methodology

Selection Process

Environmental Ambassador Pilot Program Participants

The pilot districts were selected through a non-competitive grant process in fall 2002. The selected districts were eligible for two-year grants at a maximum funding level of \$90,000. These grants focused on developing and documenting replicable education and resource conservation activities, as well as mentoring school districts that are developing new education and resource conservation programs.

Criteria for the selection of EAPP program participants (“Environmental Ambassadors”) included:

- Geographic distribution.
- Socioeconomic diversity.
- A representation of elementary, middle, and high school levels.
- A substantial track record in environmental education, waste diversion, and other resource conservation programs.
- Commitment to constructing new or modernizing existing public school facilities according to the Collaborative for High Performance Schools (CHPS) Criteria, which includes the incorporation of recycled-content materials and environmentally preferable products into these facilities.
- Commitment to working closely with CIWMB staff and consultants on program development.
- Willingness to both expand or modify their programs and serve as mentors for other school districts in program development.

Six school districts participated in the Environmental Ambassador Pilot Program. Each of these districts had existing environmental programs with the potential to serve as models for other schools. Each selected district submitted an application along with a program narrative describing its commitment to the program and how it intended to spend the grant money. Baseline waste diversion studies (referred to in this report as “pre-assessments.”) were subsequently conducted for each EAPP district by CIWMB staff in the spring 2003. Based on the results of those studies, CIWMB staff suggested opportunities to expand or create new diversion programs for the

districts or their schools. The districts then selected from among the recommendations the diversion programs they were interested in implementing during the time of the EAPP.

Unified Education Strategy Pilot Programs

Fourteen school districts were selected through a competitive process to receive funding and technical assistance to develop lesson plans for instructional activities that integrate teaching with waste diversion and resource conservation practices. The distribution of UES school grants took into account the geographic and socioeconomic diversity of California. These grants were awarded in two stages, a planning phase and an implementation phase. Grant awards for the first-year planning phase were for a maximum funding level of \$27,000. Once districts completed the goals of the first phase of the pilot, they were eligible to apply for grant awards for a second-year implementation phase. These grants were for a maximum funding level of \$38,000.

Initial Assessments (“Pre-Assessments” and Campus Needs Assessments)

Environmental Ambassador Pilot Programs

To establish a baseline from which to measure the effects of the program, each grantee in the Environmental Ambassador Pilot Program was assessed at the beginning of the program on the incorporation of diversion-related activities at its schools. These assessments are referred to as “pre-assessments” in the rest of this report.

The CIWMB staff collected data to serve as a baseline and as the starting point for design of service-learning and resource management (waste diversion) projects. For example, staff conducted waste assessments at the district offices of the grantees and at representative school sites to estimate the quantity and types of waste that were being reused or recycled or taken to a landfill for disposal.

Unified Education Strategy Pilot Programs

To establish a baseline from which to measure the effect of participating in the UES pilot program, the Office of Education and the Environment and the State Education and Environment Roundtable instructed the UES grantees on how to conduct their own campus needs assessment. Teachers and students from the UES schools carried out the assessments to obtain baseline data regarding the amounts and types of solid waste that were created and diverted in each of the participating schools.

Professional Development

Environmental Ambassador Pilot Programs

The OEE selected the EIC Model™ (Environment as an Integrating Context for learning) as the basis for the development of the EAPP instructional programs. The EIC Model™ is a system of educational practices, developed and trademarked by the State Education and Environment Roundtable.

In order to provide technical assistance to the EAPP participants, the CIWMB hosted a five-day institute in the summer of 2003. At this event, SEER instructed the participants in the use of the EIC Model™ as the basis for developing instructional units for their two-year pilot programs. At the end of year one, team participants were evaluated on the implementation of the instructional components of the EIC Model™. Year two consisted of continued planning and development of the participants’ instructional program and expansion of their site-based resource conservation programs.

Unified Education Strategy Pilot Programs

UES grantees participated in a competitive grant process for phase one, the first year of the pilot project. Once they completed the goals of the first phase of the pilot, they were eligible to apply for phase two. These UES grantees attended a two-day campus needs assessment and planning workshop in the summer of 2003. This workshop focused on helping the grantees learn how to develop a resource management and waste diversion assessment for their school sites. In phase two, individuals who were members of the UES teams participated in a spring 2004 orientation workshop. In summer 2004, a four-day professional development institute was provided to all of the UES grantees to help them learn how to develop further instructional plans for their year-two programs.

Findings From the School DEEL Project

The Findings section of this report is a result of formal and informal interviews with educators and recycling coordinators who participated in either the EAPP or UES grant programs. Staff from the CIWMB provided comments relating to their experiences and/or observations at the schools and/or districts. Additional information was derived from SEER's final evaluation report, *A Report on the Accomplishments of School Districts that Participated in the School Diversion and Environmental Education Law*. This report reveals findings based on self-evaluation rubrics and interviews. Finally, data collected by the CIWMB staff during the pre-assessments and "post-assessments" (or final assessments) at EAPP districts are included in this section.

Lessons Learned From the School DEEL Project

The Lessons Learned section of this report describes the benefits as well as the challenges faced with implementing the EAPP and UES grants. As in the case of most pilot projects, much was learned regarding what worked well and what things to avoid when dealing with curriculum and/or diversion related matters. Although this section lists more than 15 lessons learned by CIWMB staff throughout the pilot programs, possibly the most important lessons dealt with grant expectations (grantees fully understanding their roles and responsibilities), administrative support (having full support from supervisors and principals), and the importance of communication.

Recommendations From the School DEEL Project

The Recommendations section of this report offers suggestions and strategies for using what was learned from the School DEEL. Additionally, this section discusses what the CIWMB can offer schools in the way of professional development (for example, workshops and case studies), and technical assistance, such as designing programs to meet specific needs of districts and/or schools and how to ensure curriculum and diversion efforts are sustainable.

Conclusion

The final section in this report describes how the CIWMB has met the mandates as well as the overall goals and intentions of the School DEEL. This section describes the benefits to teachers and students of using the environment as a context in which to teach core subjects, such as science and language arts. It also explains how the lessons learned will be used during implementation of the Education and the Environment Initiative.

Project Description: Environmental Ambassador Pilot Program

Project Participants

The six school districts that participated in the Environmental Ambassador Pilot Program are located around the state, representing diversity in climate, geography, population, and setting (urban to rural settings). These six districts range in size from the largest having 84 schools with more than 50,000 students and the smallest having three schools with 311 students.

Table 1 shows the demographics of the six districts that worked with CIWMB and SEER staff for the entire two years of the grant program.

Table 1. Environmental Ambassador Pilot Program Participants¹

	Burbank Unified School District	Warner Unified School District	Desert Sands Unified School District	San Juan Unified School District	Oak Grove Union School District	Eureka City Schools²
County	Los Angeles	San Diego	Riverside	Sacramento	Sonoma	Humboldt
No. of Schools	20	3	25	84	2	13
No. of Students	16,747	311	25,180	50,212	588	5,247
Location	Urban	Rural	Suburban	Suburban	Rural	Suburban
Distance to Recycling Markets ³	Close	Distant	Close	Close	Close	Distant
Free and Reduced Meals (percent)	33.9%	47.8%	53.1%	20.0%	26.9	49.2%
Ethnic Diversity, English Learners ⁴ (percent)	36.5% Hispanic. 19.1% English Learners.	21.9% American Indian or Alaska Native. 18% Hispanic. 8% English Learners.	63.5% Hispanic. 30.1% English Learners.	11.9% Hispanic. 7.8% English Learners.	18.5% Hispanic. 11.4% English Learners.	12% American Indian or Alaska Native. 9% English Learners.

¹ 2002–03 demographic data obtained from the California Department of Education's DataQuest website (<http://data1.cde.ca.gov/dataquest/>). This website allows the user to generate customized reports on school districts.

² CIWMB transferred grant management responsibilities for the Humboldt County EAPP from Pacific Union Elementary School District to Eureka City Schools in 2004.

³ Distance to recycling markets was determined by a participant's travel time in accessing recycling markets. Less than one hour was considered "close," and more than one hour was considered "distant."

⁴ English Learners: "...students for whom there is a report of a primary language other than English on the state-approved Home Language Survey and who, on the basis of the state approved oral language (grades K-12) assessment procedures and including literacy (grades 3-12 only), have been determined to lack the clearly defined English language skills of listening comprehension, speaking, reading, and writing necessary to succeed in the

school's regular instructional programs." California Department of Education's DataQuest website (Glossary) http://data1.cde.ca.gov/dataquest/gls_Learners.asp.

These districts were invited to participate in the pilot program because CIWMB staff was aware of their existing environmental education programs and/or diversion activities. Based on this information, CIWMB staff believed the candidates had potential for becoming successful Environmental Ambassadors. For example, before being selected for the program, the districts had implemented white paper recycling, and most were diverting cardboard. CIWMB staff discovered that factors such as economics, geographic differences, and administrative policy impacted the efforts of each district to implement and/or expand diversion and curricular programs. These factors will be discussed in more detail in the Findings section.

Methodology: A Team Approach

After concluding the contractual steps with the school districts, CIWMB staff and the consultant (SEER) met with each district in the spring of 2003 to discuss the program and the expectations of the team. Attendees at this meeting may have included the district superintendent, a resource lead person (the contact person for diversion related programs), an education lead person (the contact person for curriculum related activities), a facilities maintenance person, the local jurisdiction's recycling coordinator, and sometimes the waste hauler who services the district.

Diversion Plan

Teams usually consisting of CIWMB staff, district staff, and the local recycling coordinator (and sometimes the hauler) toured the district offices and representative school sites to conduct a waste assessment for each district. This established a baseline of diversion activities from which to measure the effects of participating in the program. Staff interviewed department heads at the district offices about their diversion practices, making note of what was currently being recycled and what could still be recycled. The information gleaned from the assessments helped CIWMB staff to determine what kinds of source reduction, reuse, recycling, and composting activities the districts were already engaged in, and what additional opportunities for diversion were possible. Cost information on the districts' current disposal and diversion services was also compiled. Both the diversion and cost information was incorporated into a pre-assessment report for each district.

After the pre-assessment, CIWMB staff worked with the districts through their resource leads, district staff, and facilities maintenance staff to select those diversion opportunities they believed were reasonable and feasible to implement at the district during the two-year grant program. The diversion opportunities were provided to the educational team for possible blending with their efforts in curriculum development. Some of the programs were to be applied districtwide, such as a districtwide policy for procuring recycled-content paper, while others were specific projects to be implemented at select schools. The goals, associated programs, and specific tasks were outlined in a work plan for each district, with target dates and responsible parties identified. The work plans were used throughout the project to guide staff in each district. The educational teams were also made aware of these activities for consideration during curriculum development.

Education Plan

Concurrent with the pre-assessment activities, OEE grant managers and SEER staff worked with the district administrators to develop the education portion of the work plans. As in the diversion work plan, the education plan consisted of goals and specified tasks for the associated programs as well as timetables for implementation of each step and the party responsible for completion. Additionally, the education leads (usually an administrator or lead teacher) at the school districts made a commitment that the proposed participating teachers (team) from their districts would

attend a week-long environmental education curriculum development institute held during the summer of 2003.

The 2003 summer institutes provided the structure, training, and planning to be used by the EAPP educational team throughout the project. As a result of the teams' involvement, each team developed instructional units to connect conservation and/or diversion lessons with California's academic content standards. For the duration of the grant, the teams were provided ongoing technical support by SEER, OEE grant managers, and CIWMB staff to carry out the following tasks:

- Build relationships with local agencies for ongoing support of sustainable conservation/diversion efforts.
- Build relationships between employees of district departments.
- Participate in program evaluation to establish baseline data, collect evaluation data after one year, and collect final data in spring 2005.

Implementation of Education and Diversion Plans

Starting in fall 2003, CIWMB staff teams consisting of an OEE grant manager and a staff person from the Office of Local Assistance held regular meetings with the districts' resource and education leads and others on the districts' teams to finalize the work plans and begin implementation. Other participants included, as appropriate, local recycling coordinators, waste haulers, and community partners. These outside entities proved to be key players in helping the districts successfully implement and sustain their respective diversion and educational programs. These meetings were held in order to facilitate implementation of the team's educational work plan. The OEE grant manager and SEER staff helped the educators link diversion/conservation efforts and educational efforts. They also helped the educators develop internal and external relationships that would enable them to eventually work together without a high level of involvement by CIWMB or SEER staff.

The School DEEL was designed to take into consideration the practices and requirements of California's Department of Education and State Board of Education. The program was designed so that (1) the resource conservation/waste diversion could be integrated with each district's existing textbook/instructional planning so that it would not add another layer of work for already overburdened teachers and (2) instructional units developed by the districts could be readily connected to California's academic content standards and be appropriate to each grade level and subject area. In many cases, although the EAPP teams were provided with the diversion opportunities identified by CIWMB staff, the teachers' lessons may have had a different conservation practice focus. This focus may have been driven by the subject matter requirements for a particular grade level and discipline (math, reading, science, history-social science). Over time, evidence of the success of diversion programs on their campuses and in classrooms inspired teachers to use diversion-related messages and/or lessons in addition to the rigorous standards-based lessons they had created.

CIWMB staff provided technical assistance to the districts in line with the goals established in their work plans. This support varied among the districts; for example, staff researched and provided information related to in-classroom recycling bins, worm composting bins, cardboard balers, recycled-content paper prices, and local group purchasing opportunities. CIWMB staff also provided resources for teachers to use in the classroom and helped increase their awareness of the wide variety of support available in California related to conservation and diversion. Additional information to support the implementation of resource conservation programs at the

schools was provided in the *School DEEL Resource Manual*. CIWMB staff also made regular visits to the districts and helped to implement specific programs, or parts of programs, as necessary. Details of these efforts at each district are included in their respective work plans and post-assessment reports.

At the end of the grant period (April/May 2005), CIWMB staff conducted a post-assessment at each district to measure the progress made by each district related to diversion programs. This included identifying any cost savings realized by increased diversion; for example, the need for fewer or smaller waste bins or a reduced frequency of pickup because of the increased quantity of recycled materials, or increase in source reduction activities or composting.

A variety of evaluation tools were used to assess educational program components. Baseline evaluations and interim evaluations were compared to the final evaluations and assessments, conducted in spring 2005. Results are summarized in the Findings section of this report.

Environmental Ambassador Pilot Program Project Descriptions

Burbank Unified School District

The Burbank Unified School District (USD) is located in northern Los Angeles County and serves the City of Burbank. John Muir Middle School and John Burroughs High School actively participated in the EAPP. Burbank USD was selected as an Environmental Ambassador because of its strong track record in recycling. Much of the district's strength lies in its partnership with Burbank's Public Works Department and the city-operated Burbank Recycle Center. The city provides free recycling collection at all school sites. The city works with the district to encourage innovative waste diversion programs at the school sites and provides outreach and education to students. On environmental education matters, the district also partners with local organizations, including the California Regional Environmental Education Community Network (CREEC-LA), TreePeople, the Burbank Water Reclamation Plant, and Warner Bros. Studios. The district planned to use its existing connections with local resource providers and State agencies to fully develop its status as a model Environmental Ambassador.

Burbank USD's diversion-related achievements during the EAPP grant period included:

- Adopting a resolution on sustainability and resource efficiency in the design and construction of district projects. This resolution stipulated the district would incorporate criteria established by the Collaborative for High Performance Schools (CHPS) in construction projects when feasible.
- Continuing collaborative work with the city-operated Burbank Recycle Center to accommodate the district's increased recycling needs. The city provides free recycling collection to the district.
- Implementing a paper recycling program in all classrooms, thereby greatly increasing the amount of paper recycling. Most campus recycling programs are student-run, resulting in minimal impact on custodial staff.
- Increasing recycling of cans, bottles, paper, batteries, and ink cartridges within the district, and the number of on-site school gardens.
- Purchasing a mulching lawn mower with grant dollars for use district-wide.

Education programs included:

- Having Burbank USD's education programs in the EAPP complement and leverage grant funding provided by the California Department of Education for CalServe, a multi-year service-learning development program that supports the district's requirement for students to completed a service-learning project during middle/high school as a condition of graduation.
- Developing curricular units and lessons across most subject areas for grades 6–12, with a focus on resource conservation as well as campus recycling and composting activities.
- Combining Cesar Chavez grant funding with the EAPP funds and support from Warner Bros. Studios and the Burbank Recycle Center to develop garden-centered learning that includes composting, classroom vermicomposting, and Bokashi (compost by fermentation) in the teacher's lounge and some classrooms.

Desert Sands Unified School District

The Desert Sands Unified School District is located in the Coachella Valley in eastern Riverside County, and it lies within the boundaries of six jurisdictions: Bermuda Dunes, Rancho Mirage, Indio, La Quinta, Palm Desert and Indian Wells. Four elementary schools, one middle school, and one high school from the district participated in the EAPP project. Desert Sands USD was selected to be an Environmental Ambassador because of its strong track record in recycling. The district's environmental services manager position has allowed for planned resource conservation programs to be established and maintained at the district level. The environmental services manager works with all of the district's school sites to encourage the establishment of recycling programs tailored for each school's needs and provides resource conservation education for the district's teachers. The district also has strong external support provided by the Desert Resources Council, made up of 25 local conservation organizations.

Desert Sands USD's diversion-related achievements during the EAPP grant period included:

- Adopting a formal districtwide integrated waste management policy.
- Implementing a pilot food waste composting program in collaboration with local jurisdictions, the hauler, and a local compost facility.
- Developing a cooperative recycled-content product (RCP) purchasing consortium in collaboration with local jurisdictions.
- Establishing a collaborative working relationship with the hauler to meet increased diversion needs.
- Establishing a school recycling competition and recognition program.
- Developing a districtwide program for classroom paper recycling.
- Expanding the types of material diverted from the Food Service Department.

Desert Sands USD's education programs under the EAPP project became an integral component of a much larger Voluntary Public School Choice federal grant (VPSC) to the district. Some of the highlights of the education programs included:

- Developing a unified vision of resource conservation centered on the local desert environment for curricula, resulting in institutionalization of the programs at the six VPSC schools.

- Team planning across grade levels and subject areas, thereby allowing the teachers to create instructional units that build sequentially from kindergarten through twelfth grade.
- Developing environmental themes that unify each school site and grade-specific standards-based lessons that reflect these themes.
- Disseminating the instructional units to additional teachers each year as the program progressed.
- Fostering long-term community partnerships to provide sustainability of the field activities and student involvement.
- Linking lessons to the waste diversion and conservation practices on the campuses where possible.

The EAPP grant enabled Desert Sands USD to meet its commitment under the Voluntary Public School Choice federal grant to develop a family of magnet schools (K–12) with a technology and environment focus.

Humboldt Environmental Ambassador Pilot Program

Located on California’s northwest coast, Eureka City Schools took the lead on implementing this grant, which was originally awarded to the Pacific Union Elementary School District. The Humboldt County Office of Education (HCOE) supported the implementation of the EAPP throughout the two-year program. Three of the Eureka City Schools’ 12 schools (Zane Middle School, Winship Middle School, and Eureka High School) participated in the grant program. Other schools and districts in HCOE also participated in the program, including Freshwater School District (consisting of a combined elementary and charter middle school), Dow’s Prairie Elementary School in McKinleyville, and Arcata High School (which participated only in the first year). Working together, these schools and districts composed the Humboldt Environmental Ambassador Pilot Program (HEAPP) team. Eureka City Schools was asked to lead the team because of its strong waste reduction and recycling efforts, as well as its strong commitment to service-learning. In addition to its recycling efforts, Eureka City Schools’ transportation fleet has been operating on re-refined oil since 2004.

Humboldt County is unique in that it has no active landfill; all of its waste is shipped out of the county or out of the state. The lack of a local landfill provided a meaningful reason for students to take a personal interest in waste management issues.

HEAPP team teachers attended a summer training institute where they learned how to develop standards-based lessons that focused on their surrounding environment and waste management issues. In addition, Eureka City Schools implemented waste diversion programs at all district schools.

HEAPP’s waste diversion-related achievements during the grant period included:

- Setting up classroom worm bins at Freshwater Elementary and Middle School.
- Establishing large, central worm bins at Freshwater School and Zane Middle School for composting lunch scraps.
- Recycling fiberboard lunch trays at Eureka High School.
- Developing infrastructure for centrally collecting food scraps at select schools in the Eureka City Schools district and transporting the material to a proposed regional composting facility.

- Establishing a “zero waste” goal in the Special Projects Office at Eureka High School.
- Converting Eureka City Schools fleet vehicles to use by-pass oil filters, which extend the life of the oil, and purchasing re-refined oil versus virgin oil, saving \$134 per barrel.
- Implementing districtwide programs for double-sided copying, printer cartridge recycling, old textbook recycling, and electronics recycling for Eureka City Schools.

Teachers who attended the summer institute developed standards-based lessons connected to some of the resource conservation projects listed above. Examples of such lessons include:

- Use of recycling and vermicomposting as the focus of writing and art assignments in a kindergarten class.
- Development of standards-based lessons in science, mathematics, and history-social science to complement the school garden activities of K–8 students.
- Conducting energy audits both at home and at school by middle school students. These audits also measured the effects of varying tire pressure on gasoline usage.

As part of their involvement in service-learning projects, a kindergarten class created and distributed no-waste party boxes to other classrooms at their school. These party boxes, intended to replace disposable party ware, consisted of reusable plates, forks, and cloth napkins. Eighth-grade students oversaw the sorting, collection, and composting of lunch scraps from the school cafeteria.

Schools involved in the Humboldt Environmental Ambassador Program are committed to sustaining these activities into the future. HEAPP was honored with a Humboldt County Waste Reduction Award as the county’s “Most Effective Public Education Program.”

Oak Grove Union School District

Oak Grove Union School District is a two-school district located in Sonoma County. Both schools actively participated in the Environmental Ambassador Pilot Program. The district was selected as an Environmental Ambassador because of its long-term efforts in recycling, composting, gardening, and energy and water conservation, all areas in which the students are actively involved. The district also serves as a demonstration site for numerous schools regarding the mechanical aspects of recycling and diversion.

The district’s superintendent, elementary school principal, and teachers expressed strong interest in more effectively integrating all aspects of the Environmental Ambassador Pilot Program into their classroom instructional practices. The middle school principal and teachers quickly added strength to the team with their commitment to serve as Ambassadors and have continued to excel in their efforts by establishing a partnership with both the sixth graders at Oak Grove Union School District and students in Japan pursuing the same types of studies. Community groups, parents, and some local agencies are currently providing support to the program.

Oak Grove’s diversion-related achievements during the EAPP grant period included:

- Increasing recycling of organic waste by chipping green waste, food waste, and biodegradable serviceware for on-site composting; mulching for landscape efforts at school sites; composting food waste at both schools with help from parent volunteers (compost program is part of opportunities for student learning); and creating vegetable gardens at schools for use in their lunch programs (also serves as a foundation for K–2 curriculum units).

- Switching to single-stream recycling at both schools.
- Developing a video of diversion-related activities and projects.
- Developing an electronic purchase order form that features a column for the percentage of recycled-content for products being ordered.

Education programs implemented with grant funds included:

- Creating standards-based unit plans for use in pilot schools.
- Developing and implementing service-learning projects regarding storm water management and water conservation on school campuses.
- Developing student-initiated service-learning projects that focus on waste diversion, energy conservation, restoration and protection of a local creek, and used oil management.
- Participating in an information exchange/correspondence program with elementary students in Japan that center on storm water management, water conservation, and creek restoration.

School representatives have expressed a strong interest in mentoring others regarding the integrated education program once it is fully developed and functioning well in their schools. Both schools are part of a district with a commitment to resource conservation, evidenced by their solar panel-supported portable classrooms, xeriscaped entranceways, and involvement in zero water runoff projects.

San Juan Unified School District

Located in northeast Sacramento County, San Juan Unified School District comprises more than 80 schools. Two elementary schools, one middle school, and three high schools participated in the grant program. The district was selected for the Environmental Ambassador Pilot Program because of its demonstrated commitment to developing a “green schools” program and its interest in expanding successes in this area to other resource conservation and waste diversion issues. The district’s planning department and curriculum and instruction unit worked together to support school-based resource conservation efforts and identify connections to instruction practices, such as use of the EIC Model™. The district also had an energy and resource conservation plan team consisting of principals, teachers, custodians, and facility and district staff. There also appeared to be good support by the district for helping teachers develop new standards-based instructional programs related to resource conservation and waste diversion.

San Juan USD’s diversion-related achievements during the EAPP grant period included:

- Purchasing and placing in-class recycling containers at all six participating schools (approximately 200 classrooms) and utilizing transfer carts to move recyclables from classrooms to recycling dumpster.
- Recycling commingled materials including mixed paper, cardboard, newspaper, and beverage containers. Student teams developed an informational bulletin board placed in each school’s multi-purpose room to denote what is recyclable and what is made from recycled-content products.
- Upgrading its contract with the local waste hauler to provide recycling pickup at five schools.

The overall theme planned for educational programs at San Juan USD focused on K–12 energy and waste conservation. The K–12 teams met quarterly to discuss resource conservation

sustainability within the district and team coordination between participating district schools. Kindergarten and high school teams partnered to further develop ideas for resource conservation.

Education programs planned for this grant included:

- Developing lessons for participating elementary, middle school, and high school students based on content and skills outlined in California’s academic content standards by using environmental concepts and conservation topics.
- Incorporating mathematics lessons as kindergarten students recycled bottles and cans. The funds raised from the recycling efforts were kept and used to open savings accounts at a local bank for each participating kindergarten student.
- Incorporating English-language arts lessons as kindergarten students analyzed landfill construction practices and made predictions about their own on-site mock landfills.
- Incorporating English-language arts lessons as high school students wrote persuasive essays about an individual’s impact on and responsibility to the environment.

The individual EAPP teams used waste audits as the springboard for developing standards-based units. Students were then allowed to select a service-learning project with the focus on cleanup or conservation outreach. Student-driven clean-up efforts centered on Sacramento’s local “Creek Week” and showcasing student artwork to promote a litter-free and recycling-conscious campus. Elementary student teams conducted classroom energy audits and, in turn, provided each classroom with an “Energy Catch Slip” that indicated the classroom’s energy conservation and usage.

Warner Unified School District

Warner Unified School District is a two-school, K–12 school district located in rural eastern San Diego County. Both schools in this district participated in the Environmental Ambassador Pilot Program. Warner USD was selected to participate as an Environmental Ambassador due to its strong demonstration of conservation practices for the past eight years, despite its remote location and lack of access to recycling markets. As an example of Warner USD’s commitment to resource conservation, the Warner School and Community Conservation Program that services the surrounding rural community recycled more than 10,000 gallons of used motor oil and 50,000 pounds of reusable materials by 2004. This activity is operated by the students and teachers at Warner USD and receives continuous funding through CIWMB’s used oil block grants in cooperation with the County of San Diego. In addition, Warner USD developed a native plant garden and built a greenhouse in an effort to grow oak seedlings from acorns for the purpose of restoring oak woodlands burned in recent fires. The greenhouse and the native plant garden are used as centers of education for both students and community members.

Warner USD’s diversion-related activities during the EAPP grant period included:

- Adopting a districtwide resolution on environmental policies and actions tied to waste reduction and educational standards.
- Collaborating with the County of San Diego to purchase a chipper to facilitate on-site composting of the schools’ green waste and paper waste and a baler for cardboard to facilitate cardboard recycling.
- Establishing an outdoor windrow-style vermicomposting system at Warner High School, using swine manure and chipped green waste and paper waste. The compost materials are used on the campus vineyard.

- Recycling large food cans from the kitchens.

Educational efforts focused on the development of standards-based K–12 units related to local conservation and actual waste diversion activities on campus, including:

- A focus on English-language arts and science standards in grades K–3, using classroom vermicomposting and classroom paper recycling as the vehicle for student investigation.
- A focus on life cycles, earth science, and physical science centered on the oak tree project and the native plant garden in grades 4 and 5.
- A focus on energy conservation and used oil recycling in grades 6–8.
- A focus on soil science, chemistry, biology, and waste management alternatives using compost from the campus vermicomposting system at the district’s “swine unit” (where swine manure is recycled for energy generation) as the center of the studies in grades 9–12.

As a result of the curricular planning and the accessibility of the actual waste diversion practices at Warner USD, most, if not all, students were involved at some point during the school year in a service-learning project.

Project Description: Unified Education Strategy Pilot Program

Seventeen schools/districts applied for the UES grant program through a competitive bidding process. Fourteen of these districts were awarded grants. These districts were chosen to represent diversity in climate and geography, population, and setting (urban versus rural). One of the districts chose not to accept the grant because of changes in personnel. Eight of the districts completed the two-year program.

The participating schools/districts range in size from Los Angeles Unified School District, with its 677 schools and more than 746,000 students, to Pacific Unified School District, which has one school and 45 students. Table 3 below summarizes the demographic characteristics of the eight districts that worked with CIWMB and SEER staff for the entire two years of the grant program.

Table 2. Unified Education Strategy Pilot Program Participants¹

UES Participant	County	No. of Schools	No. of Students	Location	Distance To Markets	Free and Reduced Meals (percent)	Ethnic Diversity Information, English Learners ²
Chico Unified School District	Butte	25	14,011	Suburban	Close	36%	15% Hispanic, 6.5 % Asian. 12.7% English Learners.

UES Participant	County	No. of Schools	No. of Students	Location	Distance To Markets	Free and Reduced Meals (percent)	Ethnic Diversity Information, English Learners ²
Etna Union Elementary School District	Siskiyou	2	190	Rural	Distant	54.1%	8.9% American Indian or Alaska Native. 6.8% Hispanic. 2.6% English Learners.
Mariposa County School District	Mariposa	14	2,488	Rural	Distant	37%	6.2% American Indian or Alaska Native. 6% Hispanic. 0.9% English Learners.
Pacific Unified School District	Monterey	1	45	Rural	Distant	51.9%	7.4% Hispanic. 3.7% English Learners.
Petaluma City School District	Sonoma	9	2,268	Suburban	Close	25.2%	25% Hispanic. 22.7% English Learners.
San Carlos School District	San Mateo	7	2,580	Suburban	Close	2.3%	51% African American. 6.4% Asian. 9.6% Hispanic. 2.0% English Learners.
Belmont-Redwood Shores School District	San Mateo	6	2,541	Suburban	Close	3.1%	18.9% Asian. 8.9% Hispanic. 3.9% English Learners.
Los Angeles Unified School District	Los Angeles	677	746,852	Urban	Close	75.4%	12.1% African American. 71.9% Hispanic. 42.9% English Learners.

¹ 2002–03 demographic data obtained from the California Department of Education’s DataQuest website (<http://data1.cde.ca.gov/dataquest/>). This website allows the user to generate customized reports on school districts.

⁴ For definition of “English Learners, see note 4” for Table 1.

For various administrative reasons, five schools/districts completed year one of the UES grant but chose not to apply for year two, the implementation phase of the UES pilot program. These districts are identified in Table 3.

Table 3. Districts Participating Only in Year One of UES Grants¹

	Anderson Valley Unified School District	Beverly Hills Unified School District	Emery Unified School District	Hawthorne School District	MIT Academy School (Vallejo City Unified School District)
County	Mendocino	Los Angeles	Alameda	Los Angeles	Solano
No. of Schools	4	6	3	12	28
No. of Students	599	5,130	881	9,875	19,872
Location	Rural	Urban	Urban	Urban	Urban
Distance to Markets	Distant	Close	Close	Close	Close
Free and Reduced Meals (percent)	63.1%	6.6%	60.3%	83.7%	40.8%
Ethnic Information, English learners	58.4% Hispanic/Latino. 52.3% English Learners.	12.9% Asian. 5.9% English Learners.	60.3% African American. 9.2% Asian. 15.7% Hispanic/Latino. 15.1% English Learners.	29.3% African American. 59.9% Hispanic/Latino. 46.4% English Learners.	34.4% African-American. 22.6% Hispanic/Latino. 19.2% Filipino. 14.3% English Learners.

¹ 2002–03 demographic data obtained from the California Department of Education's DataQuest Reports website at <http://data1.cde.ca.gov/dataquest/>. This website allows the user to generate customized reports on school districts.

⁴ For definition of "English Learners, see note 4" for Table 1.

Methodology: A Team Approach

The unified education strategy pilot program was designed to work with schools and school districts that did not necessarily have existing diversion and/or related educational programs. As a result, the UES pilot program used a different approach from the Environmental Ambassador Pilot Program, which selected participants that already had existing diversion programs or activities. The UES districts were selected through a competitive application process and their applications were evaluated based upon pre-determined scoring criteria.

Unlike the EAPP applicants, the UES applicants were not required to demonstrate existing diversion or curricular activities related to waste diversion and conservation. The UES pilot program was designed to provide the district teams with a model for creating their own standards-based lessons using the context of a student-driven waste audit in their own classroom or campus. This is called a campus needs assessment. These grantees would create a model for waste diversion and education for their schools and districts starting at the ground level. Further, in order to be considered for year two funding, the school districts were required to submit a formal application that detailed steps for implementing their education and waste diversion program, based on the results of their campus needs assessments.

After concluding the contractual steps for year one, CIWMB's OEE staff and the consultant (SEER) met with each district in mid-2003 to discuss the program and the expectations of the team. For the district, attendees at this meeting usually included the district superintendent, a resource lead person (who would be CIWMB's point person for diversion-related programs), an

education lead person (who would be the point person for curriculum-related activities), a facilities maintenance person, the local jurisdiction's recycling coordinator, and sometimes the waste hauler servicing the district.

Year One Campus Needs Assessment

The campus needs assessment strategy used in the UES pilot program required the use of standards-based, student-driven waste assessments in year one. For this reason, CIWMB staff did not conduct waste assessments for the participating districts and schools.

The UES teams participated in a two-day professional development workshop during summer or early fall 2003. The workshop introduced the strategy for developing and implementing a campus needs assessment for use during the 2003–04 school year. This effort established the structure, training, and planning to be used by the UES teams. For the duration of the grant, the teams were provided ongoing technical staff support from SEER, OEE grant managers, and when necessary, additional CIWMB staff to carry out the following tasks in the first year:

- Using student-driven waste assessment as the context to form standards-based lesson plans.
- Developing working relationships with local agencies to provide support of diversion efforts.
- Developing relationships between employees of district departments.
- Participating in teacher and administrator assessments of the educational project to establish baseline data and subsequent evaluation after year one and year two.
- Developing an application for year two that included the results of the campus needs assessment and the implementation plan for year two.

Year Two Implementation

CIWMB staff approved year two plans in spring 2004, and the Board awarded funding for the second year soon thereafter. As part of the implementation plan, all teams were required to attend a 2004 summer institute. The institute provided the UES teams with additional information about developing standards-based instructional units, as well as an opportunity to strengthen implementation plans for the 2004-05 school year. CIWMB staff, community partners, and representatives of local jurisdictions participated in the institutes so they could provide additional support to the UES teams.

As in the Environmental Ambassador Pilot Program, teams consisting of the CIWMB grant manager, a SEER representative, and, in some cases, a staff person from CIWMB's Office of Local Assistance, held regular meetings with the districts' resource and education leads and others on the districts' teams throughout the grant term. Other participants included, as appropriate, local recycling coordinators, waste haulers, and community partners.

The following tasks were required of the grantees in the UES program during year two:

- Developing and implementing teaching units that integrated resource conservation, waste diversion, and standards-based instruction.
- Implementing waste reduction and/or diversion programs based upon the findings of the campus needs assessments.
- Continued building of relationships with local agencies to provide sustainable diversion efforts.

- Continued building of relationships between district departments.
- Administering pre- and post-assessments with students.
- Participation by teachers and administrators in ongoing and final program assessment for the UES program.
- Submitting final drafts of campus needs assessments.

In spring 2005, CIWMB staff and SEER staff conducted their final evaluations with the teaching teams and administrators at participating schools. To the extent that the participating teachers had collected data, the evaluators collected and analyzed pre- and post-assessment data related to student achievement (different from pre- and post-assessments conducted regarding waste diversion in the EAPP project).

A variety of evaluation tools were used to assess the educational program components. Baseline evaluations and interim evaluations were compared to the final evaluations and assessments, conducted in spring 2005. Results are summarized in the Findings section of this report.

Unified Education Strategy Pilot Program Project Descriptions

Anderson Valley Unified School District

Anderson Valley Unified School District (AVUSD) is located in rural Booneville in southern Mendocino County. The district includes a preschool and an elementary school, a junior/senior high school, an alternative high school, and adult education school. The total student body population is approximately 650 students. Through the UES grant, the district wished to establish standards-aligned units with cross-age service-learning activities. The district's goals for the pilot program focused on reducing waste through education and incentives, and increasing recycling and composting efforts. The students were actively involved in problem-solving, planning, and providing recommendations to the school administrators and school board.

During the first year of the UES grant cycle, Anderson Valley Elementary School and Anderson Valley Junior/Senior High School chose the following diversion-related activities:

- The sixth and eighth-grade students performed the campus needs assessments, which allowed these students to determine the amount of waste generated at the two schools.
- Following the assessment, these students attended an "Eco-Council" meeting, where they worked together in small groups to propose solutions to the problems their assessment had brought to light.
- The teams of students and staff worked to refine the solutions into a proposal that was presented to the AVUSD school board at its March 2004 meeting.
- The junior/senior high school worked to develop a sustainable recycling program.

The instructional team consisted of one sixth-grade teacher and one eighth-grade teacher, with one ninth-grade teacher and the district's bilingual and special projects coordinator providing assistance to the team. The team's efforts included:

- Sixth-grade students participated in lessons that incorporated English/language arts (reading about ecosystems and components and food web roles, specialized vocabulary, writing multi-paragraph essays), mathematics (data recording, using ratios to calculate percentages, data analysis), science (investigation and experimentation, renewable vs. nonrenewable

resources), and history-social science (read and discuss history of garbage management and compare to current practices).

- Eighth-grade students participated in lessons that incorporated English/language arts (writing summaries, preparing and giving speeches), mathematics (probability and statistics), and science (states of matter, Law of Conservation).

Anderson Valley Unified School District chose not to participate in year two of the grant program. The district explained its decision to discontinue participation in its final grant report to CIWMB:

“This is a wonderful program and resulted in student learning as well as waste reduction for the district. It has been challenging because of unclear grant expectations for the staff: desired results for the lesson plan format, required time to meet with the consultants, etc., but the consultants have been very supportive and patient. The configuration of the staff presented some problems in terms of their willingness to participate and perhaps their understanding of their role in the program. Next year we plan to continue with the waste audit (Campus Needs Assessment) and continue to try to improve our waste production and handling.

The format of the grant, with one year for planning and the following year for implementing the proposals is difficult because of the change in students participating from one year to the next, and because of the natural desire to immediately begin implementation of the solutions or improvements.”

Belmont-Redwood Shores School District

Belmont-Redwood Shores School District is a K–8 public school district serving 2,541 students in six schools on the San Francisco Peninsula. The district was selected to receive a UES grant because of the administration’s interest and commitment to fostering environmental literacy as illustrated in its mission statement: “The mission of environmental education within the Belmont-Redwood Shores School District community is to encourage all students to become environmentally literate and active. The staff, administration, and families believe that students need to value their environment, respect all life forms, understand the basic ecological principles which support our planet, and live an ecologically responsible life-style.” The district has engaged in many environmentally sustainable practices, including use of native plants in its landscaping to reduce water consumption, use of recycled copy paper, and installation of energy-efficient heating, ventilation, and air-conditioning units in all six schools. The district selected the sixth graders at Ralston Middle School (the only middle school in the district) to begin a comprehensive environmental education program that integrates environmental curriculum with waste reduction/recycling activities.

The UES team (educators at Ralston) decided to implement the following diversion-related programs during the UES grant period:

- Adopting a districtwide waste reduction policy and administrative procedures to institutionalize existing and new waste reduction programs.
- Establishing a composting project with the sixth-grade cooking class.
- Recycling paper, cans, glass, plastic, and food by the students.
- Establishing a lunch-time recycling program by the students.

The district provided professional development time for sixth-grade teachers to prepare standards-based instructional plans using resource conservation as the context. The team chose to integrate diversion/conservation efforts and curriculum efforts in the following manner:

- Students learned to plan, design, and complete a campus waste audit.
- History-social science coursework explored consumption and conservation efforts of ancient civilizations.
- Mathematics coursework applied mapping, measurement, and graphing skills by gathering and interpreting data collected during the waste audit.
- English-language arts coursework involved the writing of expository paragraphs on the effects of decomposition of natural and human-made materials on local landfills.

The team outlined service-learning opportunities such as recycling collection on campus, educating the school on waste reduction, organizing a campus and community clean-up, and collaborating with the school newspaper to report on the waste audit. The team has also been in contact with the local waste management company to monitor and review collections schedules. Further, the team has met with other campus teachers, administrators, and a county resource conservation specialist to determine the waste management needs of each school and the surrounding community.

Beverly Hills Unified School District

Beverly Hills Unified School District is located in an urban setting in Los Angeles County. There are four K–8 schools and one high school. The average class size is 25 students, with an average teacher-to-student ratio of 1 to 18.4. Beverly Hills USD has a good service-learning program, developed and sustained by CalServe service learning grants. Parent and community partner involvement is significant in this district. The district is serviced by the City of Beverly Hills for refuse and recycled materials collection.

Beverly Hills USD participated in year one of the UES grant program. Three sixth-grade science teachers, each from a different school, collaborated to design the student-led waste audits and cross-curricular standards-based lessons. Students participating in the program experienced a “guided discovery” of waste generated in the classroom and on the school grounds. The teachers incorporated instruction in mathematics, English-language arts, and science skills into their instructional plans. Students wrote essays about their experiences and received awards for their efforts. One science class constructed miniature landfills in soda pop bottles and charted observations for the duration of the project.

The findings during the waste audits motivated the students, but the students were disappointed at not being able to immediately implement changes in recycling at their school sites. Changes in the city-sponsored program were, however, planned as the city prepared to renegotiate its hauling contract to include improved recycling at the school sites.

Although the district did not participate in year two, the lead teacher planned to use parts of the curriculum and waste audit developed in the first year to create an instructional kit. This kit would be used by sixth-grade science classes to teach waste reduction and recycling to the K–5 students.

Chico Unified School District

Located in Butte County, Chico Unified School District comprises 19 schools, two of which participated in the UES grant program: Chico Country Day School (CCD) and Parkview

Elementary School. Various diversion practices existed within the district but were not uniformly implemented. Some of these practices included diversion of green waste and use of the resulting compost for landscape and playground maintenance, recycling of concrete from a remodeling project at Chico High School, and operation of a volunteer-run computer refurbishing and recycling program.

With the UES grant, Chico USD set out to establish an infrastructure for a unified approach to environmental education instructional strategies and waste management practices through the following programs:

- CCD and Parkview students conducted a waste assessment to understand their schools' waste stream and to determine the most effective waste diversion practices.
- CCD's fifth-grade class collected recyclable materials schoolwide and the sixth graders collected bottles and cans as a fundraising activity.
- Parkview's fifth-grade class focused on recycling and composting as a fundraiser.

Additionally, Chico USD used grant funds for professional development time to develop standards-based lessons. The team focused on these curriculum activities:

- English/Language Arts: Through the application of listening, reading, persuasive letter-writing, and speaking skills, students summarized their studies and educated the school, parents, and community about what can and cannot be recycled.
- Mathematics: Students analyzed the materials collected during their waste assessments by using weight, measurements, analysis, and calculations.
- Nutrition Education: Parkview implemented a composting project that complemented its nutrition education efforts.

A key aspect of CCD's project was to teach students to assess the effects of their behavior and actions on the local environment and to make a positive difference. Students collected recyclable materials which reduced the number of school trash bins from two to one. Students at Parkview also reduced their waste and plan to use the funds generated by these efforts for Environmental Camp scholarships. At Parkview, the local community partners played a key role in providing technical assistance, resources, and logistical and financial support for field trips. Both school sites will be purchasing mesh vests and signage made from postconsumer recycled goods. The district's procurement office is also taking steps to purchase environmentally preferred products in place of virgin materials. CCD and Parkview intend to sustain their program efforts by continuing to incorporate waste management practices and environmental education practices in the classroom and on the school campus.

Emery Unified School District

Emery Unified School District is a small urban public school district in the San Francisco Bay Area that consists of Anna Yates Elementary School and Emery Secondary School. The grant applicant, Yates Elementary, has approximately 450 students. Emery USD was selected to participate as a UES grantee because of its strong interest in developing an effective resource management plan for the district and the community. Using grant funds, students traveled to the city's watershed area, visited a recycling center, and observed commercial sites in order to help them develop a "green" business plan. The UES team successfully completed year one and plans to continue its efforts. The UES team decided not to apply for year two of the UES grant because the entire Emery USD underwent a school and district reorganization.

During the first year of the UES grant, Yates Elementary chose to implement the following activities:

- Conducting a campus needs assessment to determine the school's waste stream.
- Recycling aluminum cans and using the money from the recycling effort to purchase reusable trays for the cafeteria and develop a lunchtime recycling program.
- Initiating a student letter writing campaign to district and community leaders and officials describing students' recommendations for recycling on their school campus.

The collaborative instructional team, consisting of five educators and the district's science/mathematics consultant, developed lessons that heightened awareness of issues related to waste management while applying standards-based learning in mathematics, science, and English-language arts. Fifth-grade students were active in the following recycling lessons:

- Creating science journals in which they recorded daily observations and recommendations.
- Learning about resource conservation issues through thematic units that focused on personal waste, measuring classroom waste, packaging, cafeteria audit, and model landfill observation.
- Participating in a field trip to the Marin Headlands to learn about watersheds and the facility's recycling program.
- Students who attend the Emeryville Recreation Department's after-school care reinforced their monthly recycling lessons by implementing campus-based projects as well.

Students analyzed waste audit outcomes and will use the data collected to develop recommendations for the district and the community. These recommendations were to be presented at Parent Science Night and/or the Emery Unified School Board meeting. For the 2004--5 school year, students were to have participated in a service-learning project in which students would use the results of their findings to develop a lunchtime recycling program.

Etna Union Elementary School District

Located in rural Siskiyou County, Etna Union Elementary School District is a tightly knit two-school district that encompasses kindergarten through eighth grade. With a population of 800 people, the community of Etna is actively involved in school activities and has been supportive of conservation and outdoor education programs. In 2003, the community helped to establish a two-acre outdoor education center across the street from the school site, where students experience gardening activities and riparian restoration work. Prior to receiving the UES grant, the district recycled paper, cardboard, and aluminum, and had an energy conservation program.

During the first year of the UES grant, Etna Elementary School conducted a waste audit that identified the cafeteria as a major source of the school's waste stream. Specifically, the students were disposing of a significant amount of the food they were served. Consequently, the school investigated "offer versus serve" programs and is now implementing a salad bar program where students can make their own choices regarding food and size of servings. Waste diversion programs established through the grant include:

- Establishing an "offer versus serve" program in the cafeteria.
- Developing a vermicomposting area in the science lab.

- Installing aerobic composting bins in the outdoor learning center for campus yard clippings and kitchen scraps.
- Expanding the garden to accommodate compost.
- Developing classroom recycling programs.

A team of four teachers created lessons that focus on these diversion programs while also serving as the context for standards-based learning. Because Etna is such a small school, the programs were implemented in all grades, as follows:

- Seventh- and eighth-grade students educated younger students about the results of the waste audit and provided instruction on the classroom recycling program.
- The science lab, which serves all grade levels, used composting and vermicomposting to teach about decomposition and food webs.
- Students learned how compost contributes to sound gardening practices. As part of a service-learning project, students donated fruits and vegetables grown in the outdoor learning center to needy members of the community.
- Students learned how food packaging and their choices in the school cafeteria contribute to the school's waste stream.

The sense of community in Etna extends into the school as older students mentor younger schoolmates. Older students at Etna Elementary are gaining valuable leadership experience by making classroom presentations to younger students. In addition, they are collecting recyclables weekly from all of the school's classrooms and delivering them to the nearby drop-off recycling center. Service-learning is a key aspect of the Etna UES grant.

Hawthorne School District

Hawthorne School District is located in an urban area south of Los Angeles. Hawthorne consists of eight elementary schools, three middle schools, and one charter high school. The teacher-to-student ratio is 1/21.8 and class sizes average 27.6 students.

A team of sixth- and seventh-grade language arts, mathematics, and science teachers participated in the program. Due to school site construction, the team operated from two campuses, making collaboration difficult. The sixth-grade teachers were based at Williams Elementary School temporarily, while the seventh-grade teachers were based at Prairie Vista Middle School. The City of Hawthorne and Ecolutions, a community partner, were interested in supporting implementation of waste diversion efforts resulting from the first-year waste audits.

The campus needs assessment included lessons for standards-based, student-led investigations regarding resource conservation and waste on campus with a focus on lunchroom waste, organization of a waste audit, and developing strategies based on the results of the audit. The teachers developed simple step-by-step procedures and templates for students to document data and findings, including charts, graphs, and journals. Once the audits were completed by students, the teachers used the templates and journals to assess student learning.

The elementary team successfully completed the first year of the UES grant program. They completed the student-led waste audits and implemented the classroom lessons. Future endeavors based on the outcome of Hawthorne School District's campus needs assessment might focus integrating efforts in campus paper recycling and garden-based diversion, such as composting, with standards-based learning.

Los Angeles Unified School District

The Los Angeles Unified School District's Office of Environmental Health & Safety (OEHS) applied for a UES grant on behalf of their school district. OEHS took the lead on this grant because they are responsible for the management of waste for the entire district. Additionally, staff at OEHS knew of efforts in the schools to combine gardens, composting, and vermicomposting with their federally funded nutrition education program. OEHS recognized that many ties to curriculum could be made using these existing school gardens.

OEHS has worked closely over the years with CIWMB Office of Local Assistance staff and with many Los Angeles USD schools to design and implement waste reduction and diversion programs. Ongoing diversion programs include:

- Paper recycling and toner cartridge recycling at all school sites.
- Beverage container recycling for schools that requested this service.
- Participation (since 2001) in the Collaborative for High Performance Schools, which focuses on sustainable building criteria for new and reconstructed school sites.

Los Angeles USD has adopted policies for waste reduction and recycling regarding construction and demolition wastes and for the procurement of environmentally preferred products. OEHS determined that using the UES grant as a pilot at Open Charter School to implement standards-based, student-led waste audits and to implement waste reduction and diversion programs would be the best way to build a model for other schools in the district. The teachers used the grant funds to support professional development time in order to craft standards-based lessons. These lessons provided the necessary groundwork for students to conduct their own waste audits. Once the students characterized their school's waste stream, they were able to determine what activities would be most effective in diverting waste at their school. School lunch waste became their focus with a plan to have students separate their waste into three categories:

- Organic waste (non-meat) to make compost in the school garden.
- Beverage containers.
- Unsoiled cardboard food trays.

The students are also conducting a trial food waste diversion strategy that does not require the separation of food wastes. This anaerobic, containerized method is based on a fermentation process called Bokashi. It is hoped that this method will streamline the lunchtime waste diversion program as well as increase the school's overall diversion rate. The use of the campus needs assessment, whereby students audited the waste stream at their school, ensured the integration of standards-based learning with waste diversion practices. The ultimate goals of this grant were to implement an ongoing school lunch diversion program, create a "waste audit how-to" video, produce and document an environmental play, and share lesson plans with other interested schools.

Mare Island Technology Academy Middle School

Mare Island Technology Academy (MIT) is a community-based nonprofit organization that operates two public charter schools in Solano County, including MIT Middle School. MIT Middle School participated in the UES grant program to modify its current waste management practices with the ultimate goal of becoming a service-learning environmental school. With the UES grant, MIT Middle School set out to establish the infrastructure for a unified approach to

environmental education instructional strategies and waste management practices through the following program:

- Students conducted a waste audit to understand their school's waste stream in order to determine effective waste diversion practices that will help conserve natural resources.

Additionally, MIT Middle School created an inter-disciplinary, multi-faceted set of lessons to perform a comparative study of urban sanitation before and after the 20th century, including the following:

- History-social science content standards were addressed through the exploration of sanitary conditions as a contributing factor to the spread of disease in regions representing centers of commerce, such as the spread of the bubonic plague in medieval Europe and the spread of Severe Acute Respiratory Syndrome (SARS) throughout the world in the 21st Century.
- Students applied their knowledge of sanitation and issues associated with the spread of disease to their own school site by conducting an audit of their school's waste stream.
- Data collected from the waste audit were analyzed and interpreted through basic computations, measurements, percentages, and calculation of volumes.
- Students acquired knowledge of scientific concepts regarding renewable and nonrenewable natural resources.
- English-language arts standards were applied through various lessons.
- Students made an electronic slide show presentation to MIT's Board of Directors and recommended improving the school's infrastructure regarding waste diversion practices.

MIT Middle School participated in year one of the UES grant program and intends to sustain waste diversion efforts by continuing to incorporate sustainable practices as part of the school culture. The school intends to serve as a model conservation school for the City of Vallejo.

Mariposa County Unified School District

Mariposa County Unified School District is located in a rural region that serves as a gateway to Yosemite National Park from the Merced Central Valley. MCUSD comprises 13 schools. Five of these schools participated in the district's UES pilot program: Yosemite Valley Elementary School, Lake Don Pedro Elementary School, El Portal Elementary School, Mariposa Elementary School, and Spring Hill High School. Prior to award of the UES grant, various diversion practices existed within the district, but they were not widespread or consistently implemented. These practices included paper recycling, beverage container recycling, grasscycling, and vermicomposting.

With the UES grant, Mariposa County USD established an infrastructure for a unified approach to environmental education instructional strategies and an investigation of local waste management practices through the following efforts:

- Students examined the waste stream at their school sites and local community by conducting waste assessments and visiting their local landfill.
- Students in the after-school program at El Portal Elementary developed a waste audit survey for their local community and completed five in-home audits. Determining that paper and plastic comprised much of the waste in these five homes, students created plastic bag holders

and plastic bag drying racks to encourage reuse of plastic grocery bags. They also conducted a letter-writing campaign to reduce the amount of junk mail residents typically receive.

- Spring Hill High School students explored how the natural environment and social systems in Mariposa interact. This team was unable to complete the program.
- Yosemite Valley Elementary students did extensive research regarding waste management. They conducted a letter-writing campaign to reduce the amount of junk mail that MCUSD schools receive and wrote letters to a local newspaper regarding a flood at the landfill which overflowed into a local creek.

Additionally, Mariposa County USD used grant funds for professional development time in order to craft standards-based education units targeting these curriculum activities:

- English/Language Arts: Through the application of listening, reading, persuasive letter-writing, and speaking skills, students learned to summarize their studies and educate the school, parents, and community about what can be diverted, reused, and recycled.
- Mathematics: Students gained skills by analyzing materials collected during waste assessments by using weight, measurements, analysis, and calculations.
- Visual Arts: Students created a display for public exhibit. Students created graphs, maps of the local region, an electronic slide presentation, and art work from reused materials.

Mariposa County USD plans to continue its efforts and expand its environmental programs at participating schools. Yosemite Valley Elementary students intend to conduct a waste assessment of the district offices and make recommendations for waste diversion efforts to their school board. Lake Don Pedro Elementary is working on a schoolwide waste reduction program. El Portal Elementary is exploring battery and cardboard recycling. Additionally, the school plans to continue its relationship with their community partners.

Pacific Unified School District

Pacific Unified School District consists of one school, Pacific Valley School, and is located along the Big Sur coastline in Monterey County. Pacific USD serves a student population of approximately 44 students with 7 teachers. Pacific USD's ongoing resource conservation program has a 70 percent diversion rate due to the implementation of several measures, including both on-site and off-site diversion of food scraps (on-site done by composting, off-site by scraps provided to a local resident's pig), recycling of beverage containers, use of washable cutlery, paper reuse and recycling, and installation of energy-efficient features.

With the UES grant, Pacific USD set out to establish an infrastructure for a unified approach to environmental education instructional strategies and to investigate local waste management practices through the following efforts:

- Conducting a coastal cleanup and a waste assessment at a local beach.
- Conducting scientific research along part of the Big Sur coastline related to the effects of improper disposal of garbage.
- Developing and conducting a survey of local businesses' recycling efforts.
- Conducting outreach and peer teaching at neighboring schools using various mediums of art to teach science-related concepts.

- Presenting program activities (presentation made by students) to the Multi-Agency Council, represented by State agencies, federal agencies, businesses, and the local community.

Additionally, Pacific USD used grant funds for staff time in order to develop a comprehensive standards-based education unit incorporating the following disciplines:

- English/Language Arts: Developing business letters and a recycling survey and refining written and oral communication skills by way of presentations to the Pacific USD board;
- Mathematics: Tabulating and analyzing data collected from the coastal clean-up waste assessment and the local business survey.
- Science: Studying the mismanagement of waste and resulting coastal impact; developing the Long-term Monitoring Program & Experiential Training for Students program.
- Visual Arts: Designing and developing labels, public exhibit material, maps, electronic slide presentations, and art derived from discarded materials.

Pacific USD plans to continue its program with in-kind support from federal, State, and county agencies. The district also intends to communicate with and offer solutions to the local community concerning waste and resource management. Finally, the district is committed to participating in and expanding outreach to local schools through the Ambassador of the Arts and the Environment program.

Petaluma City School District

Petaluma City School District is located in southern Sonoma County. Two schools were involved in the UES grant program: Valley Vista Elementary and Mary Collins at Cherry Valley Elementary, a charter school within the district. Both schools have gardens on-site and garden coordinators who help to tie the garden into classroom curriculum. The gardens are also directly related to the cafeterias, which offer a weekly salad bar with produce grown, harvested, and prepared by the students. The salad bar is free to students.

Through the UES grant, both schools have strengthened the purpose and visibility of their gardens and have implemented the following diversion activities:

- Composting programs have been started and vermicomposting systems are being refined to handle higher food-scrap intake.
- The use of organic, biodegradable food trays has been introduced at both schools as an alternate to the polystyrene foam trays that were previously used. The biodegradable food trays are currently being shredded and added to the compost pile at each school site.
- The district joined a purchasing co-op that includes schools in Berkeley. The larger number of schools increases the co-op's buying power, thereby significantly reducing costs to the district.
- The district has also created and strengthened its partnerships with local waste management representatives.

Additionally, UES grant funds were used to develop and implement standards-based lesson plans and included the following approaches:

- A "buddy system" approach has been used to disseminate information and understanding between the upper and lower grades. This cross-age mentoring has built and strengthened a community feeling within the school. This has generated a schoolwide adoption of resource

conservation that students will carry with them throughout their elementary school experience.

- The two schools exchanged groups of students to share the information they gathered through waste audits and diversion efforts.
- Students from both schools made a joint presentation about their work at the school board meeting in April 2005.

San Carlos School District

San Carlos School District is located midway between San Francisco and San Jose on the San Francisco Peninsula. The district consists of four elementary (K–4) schools, two middle (grades 5–8) schools, and one K–8 charter school. Enrollment is approximately 2,600, with about 360 students in each elementary school, 498 in Central Middle School, 485 in Tierra Linda Middle School, and 260 in the San Carlos Charter Learning Center. Although San Carlos School District has taught various resource management methods such as source reduction, recycling, and composting, as well as energy and water conservation, the lessons were not taught in a unified and consistent manner. The district acknowledged the lack of alignment between their standards-based instructional programs and materials and the resource conservation principles they wanted their students to learn. San Carlos School District received a UES grant because they expressed an interest in implementing waste diversion activities by developing resource management audit modules for their sixth-grade classes. These modules were used at school sites to provide students with hands-on learning experiences and opportunities to develop problem-solving skills.

Based on the pre-assessment findings, San Carlos implemented the following diversion-related programs:

- Developing student-initiated service-learning opportunities to reduce waste (for example, instituting a recycling collection system on campus and educating other students and teachers about waste reduction).
- Developing community-based investigations resulting in identification of community waste diversion and resource conservation needs (for example, encouraging recycling of printer cartridges, storm drain sign painting, creek and park cleanup, clothing and second-hand materials drives, and use of rechargeable batteries).
- Establishment of environmental clubs that work to solve local environmental problems.

Additionally, the district provided professional development time for teachers to plan standards-based curricula using resource conservation as the context for instruction. The teachers designed lesson plans that integrate diversion/conservation efforts and academic study as follows:

- Students learned to plan, design, and complete a campus waste audit aligned to California's academic content standards for mathematics (statistics, data analysis, and probability).
- History-social science classes investigated how waste affects the natural and social systems in their community from a historical/social science perspective.
- English/language art students wrote a short narrative essay from the point of view of a piece of trash thrown into the school's trash container.

The participating schools outlined service-learning opportunities such as organizing a campus and community cleanup and reporting findings to the school board. Additionally, they have committed to the adoption of a waste reduction policy and the allocation of adequate space for the

safe collection, storage, and loading of recyclable materials.

Findings

The findings below are from several sources: CIWMB staff conducted formal and informal interviews with educators and recycling coordinators who participated in the UES and EAPP grant programs. Some results from the pre- and post-assessments are included; and staff from the Office of Education and the Environment and the Office of Local Assistance provided comments related to their experiences and observations at the various schools and districts they assisted. The sections entitled “Student Successes in the School DEEL Program,” “Educator Successes in the School DEEL Program,” and “School and District Successes in the School DEEL Program” and Table 4 were developed by SEER as part of its final evaluation report to the CIWMB on the School DEEL.

Program Evaluations

Student Successes in the School DEEL Program

Increasing student knowledge, skills, and understanding about waste diversion and resource conservation was one of the principal goals of the School DEEL. Students involved in both the Environmental Ambassador program and the UES project demonstrated success as they:

- Conducted waste audits (to analyze campus, district, and community waste generation) and used the data they collected to determine alternative approaches to waste management.
- Explored the effects of production, transportation, distribution, and consumption of common goods and services on the natural world and human society.
- Developed and delivered oral presentations and visual arts displays that they used to inform other students and schools, their school boards, and their local communities about waste management issues.
- Designed, initiated, or strengthened the recycling and composting programs at their schools.
- Learned how to conduct investigations about environmental issues in their communities.

Educator Successes in the School DEEL Program

Teachers and school administrators applied for EAPP and UES grants to help their students learn about waste diversion and recycling, improve their teaching practices, and, in many cases, change the way their districts handled waste diversion and recycling. The teachers and school administrators involved in both EAPP and UES demonstrated success as they:

- Worked in interdisciplinary teams to incorporate waste diversion and resource conservation into their curriculum.
- Developed partnerships with community members, resource agencies, local organizations, and the CIWMB to enhance waste management and recycling emphasis on campus, at home, and in the community.
- Learned new instructional practices that allowed them to incorporate waste diversion and resource conservation issues into their standards-based teaching.

- Increased interest and enthusiasm for waste diversion and recycling programs at their schools and throughout their district.
- Designed and implemented standards-based instructional plans that integrated math, science, English/language arts, history-social science, and technology through real-world investigations in their local communities.
- Learned how to use student assessment methods in conjunction with the community-based investigations that their students developed.

School and District Successes in the School DEEL Program

The following table summarizes the overall status of EAPP and UES grantees¹ (noted by number of districts in each stage), at the end of year two of each program table.

Table 4. EAPP and UES Grantees Operational Status at the End of Two-Year Grant Period

EAPP/UES Program Goals	Number of Districts in Each Operational Status		
	Early Stages	In Place	High-Level
Goal I: Integrating the environment into standards-based K–12 classrooms.			
District has a functioning EAPP/UES leadership team.	1	5	6
District has environment-based instructional plan(s) in place.	1	10	1
Teachers on the EAPP/UES instructional teams have implemented environment-based instructional plan(s) in classrooms.	1	6	5
Goal II: Facilitating use of environment-based education programs.			
District has a well-rounded EAPP/UES instructional team that has received professional development in environment-based education.	1	1	10
EAPP/UES instructional teams expanded on their initial environment-based instructional plans and/or created additional instructional plans.	2	7	3
Instructional plans developed by the EAPP/UES instructional teams were implemented in classrooms by teachers who were not initially involved in the program.	8	2	2
EAPP/UES instructional teams have the knowledge and willingness to serve as mentors for other school districts interested in EAPP/UES program development.	3	2	7
Goal III: Promoting service-learning opportunities between schools and local communities.			
Students have been active in on-site conservation or waste diversion efforts.		1	11
Students have been active in community conservation or waste diversion efforts.	3	2	7
Teachers facilitated service-learning opportunities that addressed the concepts of source reduction, recycling and composting.		3	9
EAPP/UES instructional team(s) have established service-learning partnerships with community members.	3	6	3
Students have developed educational projects to encourage others to	2	6	4

EAPP/UES Program Goals	Number of Districts in Each Operational Status		
	Early Stages	In Place	High-Level
utilize integrated waste management practices.			
Goal IV: Increasing the presence of resource management on school district campuses.			
School and/or district has established waste reduction policies and/or administrative procedures to institutionalize waste reduction programs.	4	5	3
Goal V: Providing data to guide future development of the EAPP/UES programs.			
School district has participated in the collection of evaluation data related to the EAPP/UES programs.	1	4	7
EAPP/UES instructional teams have documented student achievement related to their environment-based instructional plans.	8	1	3

¹ The EAPP and five UES grantees that did not participate in the second year of the program or in the year two evaluation data collection are not included in this table.

This table provides a summary of the results of the “School DEEL program” at the end of the second year. These results provide some insight into the program areas where the greatest successes were observed. Considering the fact that the programmatic goals of the School DEEL were new to the vast majority of the teachers and schools in the program, a ranking of either “in place” or “high level” should be viewed as an indicator of success for the program.

The EAPP and UES grantees made the greatest progress in achieving:

- Goal I: Integrating the environment into standards-based K–12 classrooms (92 percent of districts ranked as having these practices in place and/or operating at a high level).
- Goal III: Promoting service-learning opportunities between schools and local communities (87 percent of districts ranked as having these practices in place and/or operating at a high level).

The most problematic areas for the EAPP and UES grantees were related to:

- Involving teachers/classrooms that were not initially involved in implementing the instructional plans developed by the EAPP/UES instructional teams (33 percent of districts ranked as having these practices in place and/or operating at a high level).
- Getting the EAPP/UES instructional teams to document student achievement related to their environment-based instructional plans (33 percent of districts ranked as having these practices in place and/or operating at a high level).

EAPP Disposal and Diversion Findings

An important aspect of the waste assessments conducted at each Environmental Ambassador Pilot Program district was obtaining information on the estimated annual disposal and diversion tonnage and cost of disposal service. By conducting assessments at the beginning and end of the grant period, staff had hoped to determine whether a district’s participation in the EAPP resulted in any net savings.

Staff found that three of the districts were able to reduce their disposal amounts as a result of implementing diversion programs during the grant period, but only two of these, Desert Sands USD and Warner USD, also realized a reduction in their disposal costs. Table 5 below seems to indicate that Desert Sands USD’s disposal costs had increased by more than \$61,000. What actually occurred is that the district’s disposal service rates increased in school year 2003–04 (not shown in table), resulting in costs of \$237,802. The district was able to reduce these costs in the 2004–05 school year to \$227,190 through implementing diversion programs.

While Eureka City Schools had also reduced its disposal tonnage during the grant period, the increase in its disposal costs because of fuel and labor cost increases as well as tipping fees at the landfill more than offset any potential cost savings. Similarly, Oak Grove Union School District had an increase in monthly disposal service rates. Therefore, while its diversion and disposal amounts for 2002–03 were the same as for 2004–05, the disposal costs increased in 2004–05.

Staff also found that because many of the diversion programs were only begun in late 2004 or between January and June of 2005, not enough time had elapsed for any corresponding reduction in disposal amounts to be reflected in some of the districts’ total annual disposal amounts. Some of these programs included increased recycling of white paper and/or cardboard, composting school lunch food waste on- or off-site, and setting up vermicomposting programs. Several of the districts, such as Eureka City Schools and Oak Grove USD, anticipated, however, that another year of program implementation would result in reduced disposal tonnage and corresponding cost savings. For example, Eureka City Schools anticipates a large decrease in disposal through implementing a food waste diversion program in the 2005–06 school year.

In addition to realizing diversion achievements during the grant period, most of the EAPP districts were able to take a major step toward making their waste reduction programs sustainable over the long run by adopting a waste reduction policy. CIWMB staff has found that districts with such a policy are able to maintain waste diversion programs even when a key player such as a teacher or maintenance person responsible for a diversion program retires or transfers to another school. Other districts that did not adopt a policy made strides toward sustainability by (1) looking at ways of restructuring their disposal service contracts to include recycling service or (2) making plans to hire a staff person dedicated to finding ways for the district to increase diversion and reduce overall energy consumption.

Table 5 identifies the changes in estimated tons and disposal cost across the districts.

Table 5. Changes in Waste Generation Amounts From Participation in Environmental Ambassador Pilot Program

District	Annual Disposal Tons		Annual Diversion Tons		Annual Disposal Cost		Savings
	2002–03 School Year	2004–05 School Year	2002–03 School Year	2004–05 School Year	2002–03 School Year	2004–05 School Year	
Desert Sands USD	4,027	2,513	370	889	\$166,028	\$227,190	\$10,612
Warner USD	129	113	35	No measurable change	\$7,709	\$6,462	\$1,247
Burbank USD ¹	3,591	No significant change	1,063	No significant change	\$125,350	No significant change	N/A

District	Annual Disposal Tons		Annual Diversion Tons		Annual Disposal Cost		Savings
	2002–03 School Year	2004–05 School Year	2002–03 School Year	2004–05 School Year	2002–03 School Year	2004–05 School Year	
San Juan USD	6,757	No significant change	856	No significant change	\$230,000	No significant Change	N/A
Humboldt County EAPP ²							
Eureka City Schools	600	528	195	200	\$30,000	\$38,000	NA
Freshwater Elementary School District	39	39	12	12	\$5,340	\$5,340	NA
Oak Grove Union School District	39	39	16	16	\$2,417	\$2,593	NA

¹ The beverage container recycling program at the participating middle and high schools realized an increase in revenue for each school of at least \$2,500 a year.

² Several schools and districts participated in this grant, as described on page 13.

Ongoing Environmental Ambassador Activities

All of the districts expressed a willingness to share with other schools and districts what they had learned regarding implementing diversion programs at schools. The Eureka City Schools resources coordinator said the district would be happy to share information about purchasing re-refined oil, fluorescent bulbs, and oil filters. Also, Oak Grove Union School District has developed a video and brochures for each grade level that other districts may find useful for educational units and community service-learning opportunities. Because of teacher workload in all districts, however, the availability of individual teachers for sharing their experiences may be limited.

Levels of Program Participation

The level of program participation for both education and diversion objectives varied at all of the school districts depending on factors such as the size of the district and the level of commitment by both administrators and individual teachers. District size influenced the amount of time required to coordinate diversion projects and to integrate diversion-related content into the curriculum. None of the larger school districts included or promoted district-wide environment-based education as part of their curriculum. For example, some teachers in the San Juan USD incorporated environmental concepts into their classroom instruction; however, this was not done at each school within the district. In the case of Desert Sands USD, six schools participated in the education element of the program, but not the entire district.

Large districts have many competing initiatives and directives both from district offices and from administration offices at each school site, which may account for the difficulty of incorporating such programs at each school site. Conversely, due to its small size and the fact that it is a single-site K–12 district, Warner USD nearly met its goal of district-wide participation; Warner’s diversion activities are highly visible to all administrators, teachers, and students. Likewise, bringing curricular efforts across grade levels appeared to be much easier in the smaller districts.

Support from a district's superintendent and a participating school's principal was crucial for district-wide program implementation. Upper level support permitted administrator, teacher, and student workload flexibility related to the time required to plan and implement objectives of the School DEEL. Staff found that having direct access to the decision-makers such as the superintendent was helpful for resolving issues quickly and efficiently. Lack of such support sometimes led to a district's resistance to adopting or implementing a particular activity or program identified and recommended by CIWMB staff as helpful to ensure program sustainability, such as adopting a district-wide policy. In other cases, lack of high-level district support sometimes made it difficult for CIWMB staff to gain the willing cooperation of administrators, teachers, and/or facilities personnel to meet the overall objectives of the grant.

Clear understanding of grant expectations and requirements, both prior to applying for the grant and during implementation of the selected programs, also had an impact on district participation. Several districts indicated they were not accustomed to receiving grant funds that required delivery of specific products or taking specific actions as a condition of funding. Most indicated that their previous grants allowed the district to produce products at their own discretion, with few reporting requirements. These grantees were surprised by the CIWMB staff's insistence on obtaining pre-defined deliverables in return for the grant funds. As a result, required documentation such as progress reports, grant payment reimbursement requests with adequate documentation, EIC Model™ units, and related student assessment data were often delivered late or incomplete. A district's general attitude regarding the significance of the grant made a difference in its willingness to be accountable for completing the objectives.

Districts with support and commitment from the entire EAPP team had more success implementing new waste diversion programs. This included having team members willing and able to take the time to meet and work with CIWMB staff, local recycling coordinator(s), and/or haulers, and to follow through with the diversion plans identified during the first year of the program. CIWMB staff also found greater successes at both large and small districts that had a core of individuals with an "environmental mindset." Greater successes were achieved in the cases where core groups were made up, for example, by a combination of principals, teachers, students, and facility maintenance personnel who were willing to push for and implement necessary changes.

The general attitude of a district regarding the objectives of the grant made a difference in their willingness to be accountable for completing either waste diversion or educational goals. In some districts, the focus of the grant efforts was perceived as primarily or entirely educational; in other cases, the focus was on diversion and conservation efforts. Only a few districts intended and pursued the integration of both education and diversion efforts from the beginning.

Districts that had a staff person dedicated to recycling and with the authority to pursue a program were able to implement additional diversion programs on a larger scale and with more efficiency than those districts using a teacher as the resource lead. Desert Sands USD, for example, had a recycling coordinator in place prior to receiving an EAPP grant. The coordinator was able to dedicate a large percentage of time to the EAPP program and had authority to pursue diversion program expansion and implementation. In Burbank USD, the city's recycling coordinator was responsible for continuing implementation and expanding diversion programs for the district and was actively involved throughout the program. Districts that used teachers as the resource lead had some successes, but they generally suffered from the lead's multiple responsibilities and, in some cases, lack of authority to implement programs.

Several districts found that having their school boards adopt a waste reduction policy helped formalize the programs and raise the concept of waste diversion to a priority project that would be more likely to continue after the grant ended. Districts with a policy in place can rely on the

policy to influence and train ever-changing facilities personnel, teachers, and students, providing a greater likelihood of sustaining programs. In contrast, districts that did not adopt policies had diversion achievements limited to the few school sites that participated in EAPP. This factor, compounded with the end of grant funding to compensate teachers for time spent outside the classroom, is expected to impact expansion and sustainability. Finally, a district-wide policy could ease the way to program expansion and sustainability when working with expectations of custodial personnel.

Community Partnerships

Many of the successful participants embraced a community approach by including representatives from their local government offices (such as recycling coordinators and public works officials) and non-governmental agencies (such as waste haulers, parent volunteers, and nonprofit agencies) as members of their extended team. These members provided information, experience, and resources that teachers used to enhance lessons, field investigations, and service-learning opportunities. For example, both Belmont-Redwood Shores School District and San Carlos School District worked with Lillian Clark, San Mateo County's public works resource conservation specialist. Ms. Clark visited each of the schools and guided the teachers and students through the steps of a school waste audit. Without her assistance, it is likely that the results of the audit would not have been as thorough and complete. Ms. Clark's enthusiasm and knowledge gave the students and teachers a newfound respect for the importance of waste management in their community.

Staff found that those districts with strong partnerships with the local jurisdiction's recycling coordinator were more successful in maintaining, expanding, and implementing new diversion programs. Some districts, like Warner USD and Burbank USD, already had a strong working relationship with their respective local recycling coordinators. Participation in the EAPP enhanced these existing relationships and also led to new ones, such as Warner USD's partnership with a local paper collection company, and Burbank USD's partnership with Warner Bros. Studios and TreePeople, a nonprofit organization. At Eureka City Schools, the majority of diversion also occurred as a result of the local recycling coordinator's efforts. For other districts, working with CIWMB staff during the EAPP grant period helped establish stronger partnerships with the local waste hauler and sometimes lower rates for recycling services. This was the case for Desert Sands USD.

In other cases, while students often were a large part of the program (for example, transporting paper from the classrooms to the main paper recycling bins for the school), local partnerships with the city, hauler, and other community partners were key contributors to a district's success in this program.

Community partnerships were also a critical component of the service-learning activities pursued by districts participating in the School DEEL. Service-learning is an instructional strategy that connects academic learning in the classroom to community issues. Students apply what they have learned in the classroom to address real needs within the community. As one educator put it, "Real world learning leads to real world change. Once the students took ownership of their program, they started to believe that they could make a difference in their community."

Desert Sands USD is a good example of how a district committed to recycling can work well with multiple cities, and how its enthusiasm can cultivate community partnerships with the local waste hauler and other businesses. During the grant, the district, waste hauler, and local compost business, California Bio-Mass Inc., operated a pilot food waste composting program at the EAPP school sites. This pilot provided the district and partners with critical information needed to formulate a permanent program in the future.

In Oak Grove USD, CIWMB staff assisted in the development of partnerships that benefited the school district and the local jurisdiction. Before the district received an EAPP grant, a representative from the local transportation and public works department was cautious about the district's involvement in the project. However, after attending several meetings with CIWMB staff, school district representatives, and district facility maintenance personnel, the representative's enthusiasm increased and the department became an important partner with the district.

Assistance from CIWMB staff was also critical in the case of Warner USD. This rural district operates the community collection center for recyclables, which includes taking the collected recyclables to distant markets, as part of San Diego County's diversion program. Transporting of materials became a barrier to the program, because the responsibility fell upon the high school agriculture teacher and was limited by her time and available resources. CIWMB staff was able to bring together the county, a local business called Sunshine Summit Market, which began to serve as an intermediate collection center, and the county's hauler. Sunshine Summit Market is within 10 miles of the Warner USD community recycling center, a fraction of the previous distance to the market. The county provided the district with a cardboard baler, and now Warner USD can take more cardboard, but in fewer loads, to Sunshine Summit Market for pickup by the county's hauler.

Communication Systems

Each district crafted a communication strategy to promote and increase program awareness and participation. Within the classrooms, teachers discussed their lesson plans with their students and had them participate in the dissemination of information regarding waste diversion and conservation programs in various ways. In some schools, the students used school newspapers as a means to inform other students and teachers about their efforts. They also made banners and posters to display information regarding their programs. In several instances, the students made presentations at assemblies and school board meetings to inform, notify, or update the community on their progress. The students also used these strategies to request assistance with their projects and to communicate the need for the projects to be sustainable.

Project team members, who often included educators, administrators, maintenance staff, and governmental representatives, communicated in a variety of ways. In many cases, they met regularly to work collaboratively on lesson plans or to resolve problems that they may have encountered. In other cases, there was a "point person" or lead on the project who would disseminate information in person or by e-mail. The point person often served as the conduit between the administration, the program "providers" (such as CIWMB staff, local government, and haulers), and the teachers. This person shared information formally in a setting such as a regular meeting, or informally by speaking with individuals or sending e-mails.

The Eureka City Schools demonstrated the value of having a dedicated point person by using part of the grant dollars to hire Morgan King as part-time grant coordinator. This individual strengthened the collaborative spirit and undertook critical tasks such as coordinating with the custodian's union regarding the installation of a new school garden and organizing extensive vermicomposting training for teachers. In addition to coordinating monthly team meetings for teachers at their respective schools, Mr. King published a monthly newsletter to document team progress, upcoming events, grant deadlines, and available resources. All of the team teachers were enthusiastic about Mr. King's efforts and felt that he kept them on track. Andy Rostad, an Americorps Volunteer, assisted Mr. King by providing hands-on assistance to teachers. Mr. Rostad gave classroom presentations on recycling and composting and assisted students working in the school gardens.

Several participating educators commented that until the EAPP and UES grant efforts, communication and collaboration between segments of school district personnel rarely or never occurred. Specifically, teachers and facilities personnel were often surprised that they could successfully interact with each other. These diverse groups sometimes have different ways of communicating, particularly related to terminology used by facilities and educators. CIWMB staff often provided the “bridge” to open up these avenues of communication and interaction between teachers and facilities personnel by developing readily-understood systems of scheduled, ongoing communications both within the district and between the district employees and staff of external supporting organizations. For example, Los Angeles USD uses a variety of methods to communicate diversion programs that are available to all schools, such as refresher training for facilities personnel and written memos to school site staff and educators on a regular basis.

Some CIWMB staff observed that schools, teachers, and administrators were inundated with internal and external correspondence. In several districts, technology limitations resulted in inadequate Internet access and little or no access to e-mail. Additionally, school principals and other administrators might have conveyed information to their teaching staff only if they considered it very important, but at other times they might have failed to pass it on due to the sheer volume of communications. As a result, the most effective means of communicating appeared to be through a combination of methods that happened at regular and ongoing intervals. One-time releases of information nearly always failed to reach some or all of the intended audience.

Model Units

As a requirement of both the EAPP and UES grants, each grantee produced model units which were submitted to OEE at the conclusion of the grant term. These units include plans for K–12 in subject areas such as science, history-social science, English-language arts, and mathematics. In some cases, teachers incorporated electives such as a cooking class, journalism class, or technology class to teach environmental concepts. Each unit plan describes in detail the academic content standards that were targeted by the instructional units. They also describe what resources (such as adopted instructional materials, reading materials, and reference materials), were used to complete the units. The units will be available from the CIWMB website as models for other schools and districts to use. Additionally, many of the participants have expressed a willingness to act as mentors to other districts by answering questions regarding their own experiences. Contact information for these individuals will be available along with the model units to provide an additional resource for interested parties.

Each school assessed its program in a different manner depending on the scope and intent of their lessons. Consequently, there was not one baseline data set for all participating schools, which is a limiting factor in measuring overall results. However, in the final reports, most teachers reported students understood the importance of their environment and how social systems affected natural systems. The teachers also felt that cross-curricular and cross-grade level teaching, as well as service-learning, were effective instructional strategies that allowed students to apply their subject matter knowledge to real-world learning experiences.

Teachers from Mariposa County USD and Pacific USD reported that their students are grasping the systems-thinking concept and are applying it in other areas of their studies. Additionally, Brad Bailey, superintendent of Pacific USD, observed the following:

“This thing is really taking off, and the cross-curricular teaching and student-generated ideas is [are] far beyond my wildest imagination. The staff has really taken this seriously. . . .the light has suddenly gone on in the kids’ minds, and they actually believe they can make a community-wide impact. They are now driven and taking charge of this whole thing. The

cross-curricular and higher-level of learning and application for the kids are building their confidence as complex problem solvers.”

Some teachers expressed concern that the workload expected on the curriculum side was too great. The EIC Model™ adopted for the School DEEL program is designed to build depth and sustainability of teaching practices in schools and teaching teams. Because this model is intended to achieve broad school improvement, it is involved and complex, requiring development of a variety of skills by the team members, in-depth planning, and coordination on how State-required concepts are taught to the students. This instructional strategy is usually implemented over a five-year period, whereas the two-year grant allowed two years.

The two-year timeframe for the grant program pushed implementation of service-learning and student assessment components into the second (final) year of the grant. This was difficult for some teachers, as the grant required evidence of accomplishments and changes in student achievement as a result of the grant-related efforts. Waste management and resource conservation were implemented as lessons inserted into the year-long course of study. This limited the scope and depth of the grant-related lessons and, as such, resulted in a lack of valid student assessment data and measurable student achievement outcomes.

Implementation of unit plans required sequential coordination by teachers on the team to implement their individual lessons. Therefore, all teachers must have previously taught their students the basic skill necessary for the students to carry out the grant-related lessons. In some cases, this required teachers to reorganize their lesson sequencing for the school year, or to teach basic skills earlier, out of sequence. In some cases, the complexity of this type of planning and the lack of flexibility allowed by administrators prevented fully carrying out the grant-related lessons.

CIWMB staff suggested the workload on the curriculum side negatively impacted diversion efforts when a teacher was also the resource lead, as there was little time left to implement diversion programs. CIWMB staff working with the districts believed that the instructional demands of creating comprehensive instructional units may have been too time-consuming and required too much energy from teachers, or that the one-week summer institute may not have been enough training to enable teachers to fully understand how to apply the EIC Model™. For example, CIWMB staff thought that the teachers expended extra effort integrating waste programs into the comprehensive instructional units they were required to develop, raising questions as to the efficiency of the method as a tool for integrating waste diversion programs into units. Specifically, teachers were struggling with how to integrate waste diversion programs into the classroom and curriculum. This often led to a division between education and diversion programs.

Lessons Learned

School educators, CIWMB staff, and SEER consultants reported many benefits as well as challenges with the School DEEL pilot programs. As in the case of all pilot projects, staff learned what worked well and what things to avoid in the future. The following comments/suggestions were submitted in final reports or discussed as part of the interviews conducted throughout the program:

- **Grant Expectations:** Despite explanations, summer institutes, and explicit deliverables in the grant contracts, some of the grantees still did not completely understand what was expected of them throughout the program. This seemed to be particularly true when the district did not have a designated liaison between teachers, administrators, and CIWMB staff. Districts that allotted additional time to a single employee for the administration of this grant

instead of having the duties shared among many employees as an additional assignment were the most successful. CIWMB staff also found that it would have helped some districts to have spent more time in the beginning establishing clear goals and the responsibilities of each team player. More explicit statements in the grant agreements regarding expectations of the grantor and grantee may help avoid such misunderstandings in any future program. For example, the grant notification should explicitly state that participating in recycling and waste reduction activities is an essential component of the grant and a requirement for receiving some portion of the grant money to participate.

- **Administration Support:** Some of the districts were interested in either the educational component or the diversion component but were not able to develop comprehensive strategies that included both. Those districts that had program support from the top of their administration were more likely to successfully combine the different components, usually by providing service-learning opportunities for their students. Also, some teams had difficulty because they lacked the support from their administration with regard to time allotted for team meetings. In some cases, the composition of the team was incomplete (for example, lack of involvement from maintenance or district offices, and/or absence of key teachers). Teams where the administration supported development time and allowed all team members to actively participate were more likely to have a comprehensive program.
- **Communication:** Due to the complexity of the instructional units and the expectations for the deliverables, some teachers who joined the program during the second year were either unsure of their responsibilities and the information they were required to provide at the end of the grant term, or they felt unable to fulfill those responsibilities due to the complexity and compressed timeframe. In some cases, this seemed to stem from a lack of understanding of expectations, complicated by communications between the teacher and the person(s) at the school or district who was the primary contact for the grant. Additionally, many times the primary contact and/or initial grant applicant did not have a clear understanding of CIWMB expectations and did not communicate his or her questions, concerns, or needed resources with CIWMB staff. This lack of communication resulted in misunderstandings and missed opportunities.
- **The EIC Model™:** This model is a comprehensive educational strategy that is designed to be used as a school improvement model. Several of the districts, such as the Desert Sands USD, chose to fully implement the model and were successful at developing their instructional programs. This model was not a good fit for all of the participating districts, and two districts chose to use other strategies as the basis for designing their instructional units. Because the EIC Model™ is intended as a school reform strategy, it requires a five-year implementation process. Attempting to compress implementation into just two years may have been the reason for some of the difficulties teachers and administrators faced.
- **Time:** The short time frame for School DEEL planning and implementation was challenging because it did not allow teachers to readjust their instructional strategies as needed. Additionally, evaluating the long-term effects on both students' learning and waste diversion without a few more years of comparison is difficult.
- **Funding:** The funding to each district varied, up to a maximum \$90,000. For large districts, this funding level was regarded as inadequate. In retrospect, amounts funded should have been based on the size of the district, number of schools participating, and an assessment of existing infrastructure related to curriculum and diversion. In all cases, paid time for professional development and team meetings was very important, and without the grant funds, many districts would not have been able to participate. This is also the case in most districts regarding diversion efforts. The funding was used to establish administrative support

for the program, purchase equipment or materials, or to pilot new diversion programs. Program sustainability and growth will be difficult without a source of additional funding for most districts, although several districts are committed to continuing the programs with district funding.

- **Sustainability:** The sustainability of these pilot programs depends on many factors, including future funding, commitment from top administration, and continued technical assistance. Most districts had several dedicated teachers and community partners committed to the grant efforts. However, an established “environmental culture” and systemic implementation are necessary for sustainability. Adoption of a waste reduction policy by school boards lends support to program sustainability. In the absence of these components, if the key teachers or community partners leave, it is unlikely that the programs will be continued by others. Fortunately, several districts were either reducing their costs through diversion or gaining revenue from their recyclables. These districts are most likely to continue and/or expand diversion practices.
- **Community Partnerships:** Partners that provided support and resources were of tremendous value to the schools. Although many of the teachers were excited to learn how to incorporate environment-based learning into their standards-based curriculum, they also needed the expertise of professionals and businesses that provided opportunities for service-learning and community service as well as successful diversion programs.
- **Authority/Lead:** The lead person at the district should be someone with authority to make decisions on both curriculum and resource issues. This person could then potentially assign a lead for a curriculum team, such as a teacher, and a lead for a resource team, such as a facilities staff member. The problem with having a teacher as the resource lead was more a matter of lack of time than enthusiasm or ability, as working on diversion programs was not the teachers’ sole responsibility within the district. In addition, while the teachers were usually very enthusiastic and hard-working individuals, they often did not have the authority to implement new ideas.
- **Custodians:** For some districts, having the same custodial staff for the duration of the program was beneficial. For other districts, the custodial staff played a very minor role in the program, as the district relied on students to take the recyclables from the classrooms to the main recycling bins. While this may have been acceptable for the duration of this particular grant program, CIWMB staff questions the sustainability of a program that does not have the support of the district’s custodial staff.
- **Volunteers:** Although volunteers can be helpful for any program, they may leave; thus, relying on volunteers does not make for a sustainable program. Relying on volunteers may also create custodian union conflicts, so to avoid such problems, teams should also coordinate with appropriate unions during the planning stages of the program.
- **Teamwork:** Developing a widespread diversion program is time-consuming and labor-intensive. Staff found that it would have been helpful in some cases to have teams rather than a single person be responsible for the diversion side of the grant. One faculty or staff person would likely find it difficult to be responsible for all the tasks involved in implementing recycling programs, in addition to carrying out his or her other duties. Further, communication often is made more difficult when the point person is handling multiple responsibilities.
- **Size of District:** When it comes to implementing pilot projects, smaller districts appear to have more advantages (for example, it is easier for teachers to collaborate, meet regularly, and communicate information) and because they did not have as many layers of

administration, decisions often were made efficiently and quickly. Larger districts usually had more resources; however, that did not compensate for the logistical difficulties of working in large groups. CIWMB staff who worked in large districts but used a “vertical integration” method—that is, artificially making the district “smaller” by conducting the pilot at elementary and middle schools that feed into only one high school—were also able to achieve some of the benefits of a smaller district.

- **Distance From Markets:** Although rural districts that were far from recycling markets lacked some recycling opportunities, they were able to compensate somewhat by being flexible, creative, and willing to reach out to the community for assistance. For instance, Eureka City Schools tried to recycle milk cartons but could not afford the cost of transporting them to a facility, so it focused on developing a waste reduction program for food instead. Etna Union Elementary School District wanted to recycle paper, so a teacher asked a driver who picked up recyclables at a local store whether he would be willing to also pick up their paper at the school once a week. Although it took some extra work, these districts were able to overcome the barriers created by their locations.

In the case of Warner USD, this barrier of being far from markets was overcome when San Diego County provided a small cardboard baler to the school district. This purchase enables the district to compact the cardboard into fewer loads. In addition, because the cardboard is baled, a local business within 10 miles of the Warner USD community recycling center, Sunshine Summit Market, has agreed to take the district’s baled cardboard. At this location, materials collected at Sunshine Summit Market and the district are re-baled into larger bales, collected by the hauler, and taken to the distant market.

- **Service-Learning Opportunities:** Teachers and students alike seemed to embrace the service-learning opportunities that came with having both the educational and diversion programs in place. Teachers were able to evaluate whether their students understood the concepts taught to them, and the students enjoyed applying their knowledge to “real world” situations. Some school districts are implementing service-learning requirements as a requirement for high school graduation. Therefore, including a service component in School DEEL met some additional districts’ needs.
- **Outside Factors:** Some CIWMB staff found that despite the efforts at individual schools to reduce their waste, illegal dumping of bulky items at school sites can be a problem if one is only looking at changes in total disposal as a measure of success. Having to deal with illegal dumping also increases a school’s disposal costs and is a problem for many schools in the state, not just the School DEEL program participants.

Recommendations

The following recommendations for future environment-based education and waste diversion outreach in schools result from the findings, lessons learned, and experiences of CIWMB staff while implementing the School DEEL. Much of what was learned in School DEEL can be applied during the implementation of the Education and the Environment Initiative.

Beyond the Environmental Ambassador Program: CIWMB should offer a modified Environmental Ambassador program. Successful schools/districts would act as mentors for other schools/districts throughout the state. The modified program would include minimal reporting requirements for the Environmental Ambassadors. The CIWMB would provide technical assistance (such as educational workshops, samples of requests for proposals and contracts) and

possible incentives (such as recognition, materials). This would not be a grant program, however, because that would limit the flexibility of the programs and the number of potential Ambassadors.

Professional Development: CIWMB should hold regional workshops to explain and disseminate training tools for schools, as funding and resources allow. This would be more cost-effective than working with individual schools. In following such a plan, staff would document the School DEEL experience and develop mini-presentations, case studies, and videos that can be disseminated via the Board's website and in regional workshops. These tools would serve to help schools and districts start environment-based education and diversion programs. Several grantees have already created useful videos and other materials that staff uses during professional development and in providing technical assistance.

The CIWMB would continue to identify schools that are implementing diversion programs, including those on small budgets, and develop case studies and other tools to help schools and districts develop waste reduction programs. The tools would be made available on the CIWMB's website.

Technical Assistance: CIWMB staff should continue to assist districts/schools in identifying how to integrate resource conservation and waste diversion with their instructional programs. Any future programs to help an individual school or district integrate diversion programs into the curriculum should be longer than a two-year time period. The participants should take time up-front to plan various phases of the program and determine how much additional time would be needed to complete the following tasks:

- Planning (what will be done, who will be responsible for what activity, when it will occur, what training is necessary, how success will be determined, etc.).
- Full understanding of and commitment to the plan by all parties involved.
- Selecting/purchasing of materials (classroom containers, bins, mulching mowers, videos, resource guides, etc.).
- Designing and developing/implementing training.
- Monitoring and making adjustments (the team could identify some general timeframes for future efforts).
- Designing a system of scheduled, ongoing communications, within the district and with external supporting organizations, that is readily understood by all.
- With any future school waste diversion programs, CIWMB staff should work with the district's recycling coordinator to identify any infrastructure limitations up front so the district does not waste time developing a program that can't get collected materials to a market. In addition, CIWMB staff should develop a way to follow up on whether a district has not only connected with local infrastructure, but is maintaining that connection.

Sustainability: For any schools/districts interested in beginning or expanding an environment-based education and waste diversion program, staff will work with the district to create a plan to develop, implement, and maintain a sustainable program. For example, a district would need to develop internal mechanisms, such as identifying permanent staffing for various tasks, and having a plan for handling staff turnover to ensure program sustainability when any key people leave the program. These plans should be revisited and adapted at scheduled intervals due to the nature of the ever-changing educational system. A sustainable program would also require a planning team, implementation team, and staff positions that would carry the program into the future. Internally,

this means that CIWMB staffing resources would also have to be allocated for the post-pilot phase.

CIWMB Internal Program Development: The Office of Local Assistance and the Office of Education and the Environment staff will continue to develop coordinated internal communication strategies for an integrated diversion and environment-based education approach for school districts. Additionally, OEE will continue to incorporate CIWMB strategic goals into new legislative initiatives related to environment-based education programs.

Conclusion

The California Integrated Waste Management Board successfully met the mandates of the School DEEL by creating an Environmental Ambassador Pilot Program (EAPP) and a unified education strategy (UES) for schools and school districts. The grant funds made available through the School DEEL enabled schools to design and expand sustainable elementary and secondary school environment-based education and resource conservation programs. The CIWMB met the intent of the School DEEL by assisting schools and districts to establish environmental programs, document their efforts, and use what they have created as models for schools that have yet to establish their own programs.

The efforts expended in implementing these mandates resulted in more schools becoming aware of the advantages of using environment-based instruction. Teachers learned that environment-based learning can be integrated into subjects such as science, history-social science, mathematics, and English-language arts while meeting California's academic content standards for those subjects. Teachers learned that students can grasp concepts better and retain information longer when they have the opportunity to use what they have learned by actively participating in service-learning projects. As students connected what they learned in their classrooms to their own communities, they sharpened their communication, leadership, and mentoring skills. More importantly, they discovered that their individual efforts can make a difference.

Several of the documents referenced in this report (see Resources section) reflect mandates defined in the Education and the Environment Initiative. This initiative directs the California Environmental Protection Agency and the California Integrated Waste Management Board, in cooperation with the Resources Agency, State Department of Education, State Board of Education, and Secretary for Education to complete the following:

- Develop education principles and concepts for the environment for elementary and secondary schools.
- Ensure that the education principles and concepts for the environment are aligned to the academic content standards adopted by the State Board of Education and do not duplicate or conflict with any academic content standards.
- Incorporate education principles for the environment in criteria developed for textbook adoption in science, history-social sciences, mathematics, and English-language arts.

As the School DEEL comes to a conclusion, the Education and the Environment Initiative provides the CIWMB and Cal/EPA with new educational opportunities. The pilot projects conducted through the School DEEL grants gave CIWMB staff the opportunity to learn how to work effectively with California's schools and school districts. The experience and knowledge gleaned will be used by CIWMB staff as they continue to support implementation of the Education and the Environment Initiative.

Resources

School DEEL

To assist schools and school districts in planning and implementing a program comparable to School DEEL efforts, the following five documents have been developed and made available in electronic form. These documents contain supplementary materials originally designed to assist

Environmental Ambassador Pilot Program and unified education strategy grantees in planning and implementing the service-learning component of the School DEEL program. Now that the School DEEL program has concluded, the documents may provide other interested schools with the information necessary to design and implement comparable programs on their own campuses.

[SB 373](#) (Torlakson, Chapter 926, Statutes of 2001)

Case Studies and Technical Support

The document entitled *School DEEL and Environmental Service-Learning: Case Studies and Technical Support* is a manual that showcases successful campus-based service-learning projects related to integrated waste management, energy and air resources, and water resources. It also provides sources of technical support for carrying out needs assessments and service-learning projects; identifies organizations, agencies, websites, and other resources that can answer questions and offer local assistance, and includes student surveys that have been developed and tested for use at the sixth-grade level. (www.ciwmb.ca.gov/Publications/default.asp?pubid=1139)

Sample Campus Needs Assessment

Designed for use with the *Sample Environmental Audit Tools* document described below or other auditing procedures, the Sample Campus Needs Assessment serves as a guide for teachers and schools who want to assess campus use of natural resources and associated waste management practices. It focuses on selected sixth-grade standards, and can be easily modified to work with other academic content standards. (www.ciwmb.ca.gov/Publications/default.asp?pubid=1141)

School DEEL Resource Manual

The *School DEEL Resource Manual* offers general background information on issues related to integrated waste management, energy and air resources, and water resources. It also includes primers that provide detailed information on specific subjects, such as composting and vermicomposting, that may be applicable to service-learning projects. The manual also provides a glossary and an annotated listing of related educational resources, including publications and websites for teachers and literature appropriate for sixth-grade students. (www.ciwmb.ca.gov/Publications/default.asp?pubid=1143)

Sample Environmental Audit Tools

The *Sample Environmental Audit Tools* document provides three separate campus audit tools that offer students an opportunity to participate in an assessment of resource management practices on their own school campus. Standards-based procedures reinforce investigation and experimentation skills as students collect and analyze real data related to the generation of waste, the use of energy and water, and the occurrence of water runoff on campus. The data collected by students through these campus audits provide a baseline for subsequent evaluation of the effectiveness of programs related to campus resource use and the diversion of waste or water runoff. (www.ciwmb.ca.gov/Publications/default.asp?pubid=1140)

School DEEL Unit Plan

The *Sample School DEEL Unit Plan* is designed for use with the *Sample Campus Needs Assessment* and *Sample Environmental Audit Tools*. This unit plan is intended to serve as a guide for teachers and schools who want to create and implement an instructional unit that merges environment-based service-learning with academic study. Specifically, it is designed to help students work toward mastery of sixth-grade standards and explore their community's use of natural resources. In addition, the unit plan provides a framework for systems-thinking and an introduction to California's Environmental Principles and Concepts, a component of the

Education and the Environment Initiative. The *Sample School DEEL Unit Plan* outlines a series of lesson plans that educators can easily modify to meet their needs.

(www.ciwmb.ca.gov/Publications/default.asp?pubid=1142)

Sample Work Plans and Post-Assessment Reports

These are work plans and post-assessment reports developed by EAPP grantees.

(www.ciwmb.ca.gov/Schools/)

Education and the Environment Initiative

[AB 1548](#) (Pavley, Chapter 665, Statutes of 2003)

The *Environmental Principles and Concepts* document (draft Cal/EPA document) examines the interactions and interdependence of human societies and natural systems. It is available at

www.calepa.ca.gov/Education/AB1548/.