

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

DRAFT

CAMPUS SUSTAINABILITY PLAN

May 2007

Barriers

- Development of commissioning plans and implementation.
- Time management for field work and documentation.
- Providing cultural changes within campus departments.

Cost: After paying certification fees, the LEED EB process will cost very little to implement, because it is operations-based. Possible costs could include staff time.

1.2.6 Long Term Goals (5-10 and 10-20+ years)

Goal 1: Continue to educate the campus on the impacts of new construction as well as the successes of UC Santa Barbara's sustainability efforts.

Action Items

Action 1: Continue education and outreach to the campus and the community at large. Develop programs that teach the campus as well as other outside organizations about sustainable design and sustainable practices.

Goal 2: Design, construct, and operate buildings using a closed-loop process.

Action Items

Action 1: This goal calls for no waste in the construction process and building operation. This is a very long-term goal. Barriers at this point are knowledge, such as life-cycle data, and technology. Biomimicry is the impetus for this goal.

1.3 ENERGY

1.3.1 Current Sustainable Practices

The Campus Energy Team has been implementing energy-efficiency projects such as upgrading lighting systems, retrofitting HVAC systems, and improving laboratory ventilation. These projects have netted incredible energy and cost savings for the university. The changes implemented by the team between 2000-2006 have relieved the campus of \$1.4 million in annual energy costs, equating to 12 million kWh, or 16 million pounds of CO₂¹. Grants and rebates covered nearly half of the total cost of these energy conservation measures, and many individual projects were completely funded by public utilities, namely Southern California Edison, Savings By Design program and the Southern California Gas Company. The Campus Energy Team has a detailed energy conservation plan scheduled to be implemented in the next 3 years which will reduce the campus' CO₂ footprint by an additional 7400 tons.

UCSB follows a portfolio approach to reducing its greenhouse gas impact. This means aggressively pursuing low cost, high return energy efficiency upgrades, while making strategic investments in cost effective renewable energy and continuing to promote energy education for all campus constituents. This approach ensures the biggest impact with the finances available and tackles the problem of global warming from several angles.

In addition to retrofitting projects, UC Santa Barbara's Facilities Management (FM) department joined the California Climate Action Registry (The Registry) in 2006. The Registry is a non-profit, voluntary

¹ Metrics based off of energy conservation projects (not including ECONII) implemented on campus from 2002-2006.

registry for greenhouse gas (GHG) emissions. The purpose of the Registry is to help companies and organizations with operations in California establish GHG emissions baselines against which any future GHG emission reduction requirements may be applied. FM will continue to register the campus' GHG emissions with CCAR for the years to come, and use the valuable data collected in the process to implement effective energy-saving and emission-reducing measures.

In the goals below UCSB relies on the portfolio approach in order to reach a climate neutral campus.

1.3.2 Mission Statement

In order to realize our vision, the Energy Team will provide leadership for our campus by:

- Planning energy conservation measures
- Reviewing plans for new construction to ensure energy-efficiency forecasts meet campus and State standards
- Investigating and employing new renewable or energy-efficient technologies
- Providing information about our energy use and its global environmental impact to campus constituents
- Recommending the purchase of renewable energy sources where these resources prove cost-effective

1.3.3 Long Term Vision

We will work to reduce non-renewable energy consumption on campus, through energy conservation and strategic procurement of energy resources, until our campus can accomplish its mission independent of non-renewable energy sources.

1.3.4 Short Term goals

Goal 1: Develop a Campus Climate Neutral Plan by 2008.

Action Items

Use Bren School CCNI group project, American College and University Presidents Climate Commitment recommendations, and expertise of the UCSB Energy Team to develop a plan to become a climate neutral campus.

Barriers

None at this time.

Goal 2: By 2010, reduce greenhouse gas emissions to 2000 levels*

Action Items

Action 1: The campus Energy Manager projects that implementation of energy conservation measures currently proposed by Facilities Management will achieve this goal by the target date. A project list is included in Appendix C. These projects will cost a total of \$3.6 million, with \$1.5 million covered by grants. The university will need to invest \$2.1 million to receive a 31% return on investment. These energy conservation projects will decrease greenhouse gas emissions by a total of 4000 metric tons per year.

Timeline: Implementation of some of the energy-efficiency projects has begun. The proposed energy conservation projects start in 2006 and end in 2008.

Goal 3: By 2020, reduce greenhouse gas emissions to 1990 levels*

Action Items

Action 1: Continue to implement the energy-efficiency projects stated in Goal 1 and pursue renewable energy sources to further reduce GHG emissions. This may include pilot projects of energy technologies that are new to UC Santa Barbara, such as cogeneration, on site renewable generation, and increasing renewable sources of energy in the power content labels. With an assumed increase in renewable energy from the grid, reduction of emissions to 1990 levels will result in a projected 6000 metric ton decrease in GHG emissions from our current emissions level².

Barriers

Potential barriers include lack of funding, growth of the campus building stock, an increase in energy-intensive research activity, and growth of the student population by a projected 5,000 students. Additionally, in many instances renewable energy technology is currently cost prohibitive.

*California Governor's goals for greenhouse gas emission reduction: <http://www.climatechange.ca.gov/>.

Goal 4: Develop a variety of funding sources and financing alternatives for energy efficiency, renewable energy, and clean energy projects that will enable UCSB to be flexible in addressing the campus' energy needs.

Action Items

Utilize the Savings by Design and TGIF programs. Work with the Development office for potential donors to fund campus energy projects. Continue to develop energy projects and savings associated with the projects.

Barriers

Gathering enough funds and having the right technology available will be the two main barriers.

Intermediate and Long Term Goals (5-10 and 10-20+ years)

- 1) Use 33% less electricity than our 2010 baseline by 2050
- 2) Reduce fossil fuel usage to 20% of total consumption (used in natural gas fired cogeneration)
- 3) Increase photovoltaic production to 7% of total consumption – about 4.2 million kWh per year
- 4) Increase wind energy production to 20% of total consumption – about 12 million kWh per year
- 5) Increase new green technology to 6% of total consumption – 3.6 million kWh per year
- 6) The university will look into marketing of emission credits as a means to bridge the cost feasibility gap for green power projects.

1.4 FOOD

The functional area for food is divided into two groups, one for University Center (UCen), the other for Housing. These two areas cover food production on the entire campus.

² Based on conversations with Southern California Edison and predicted trends in the industry, UC Santa Barbara Energy Team predicts the increase of renewables in the Power Content Label.

Cost: Significant data collection will be necessary in order to determine a cost for this goal, including additional costs for TAP and revenue lost by not installing new parking. Because of the huge parking subsidy from the university, we expect a net negative cost in the long-term.

1.8 WASTE

1.8.1 Current Sustainable Practices

Recycling Programs Main Campus- The practice of reducing, reusing and recycling has been in effect at UC Santa Barbara for over two decades. Many of the campus' recycling efforts have been in place long before the passage of the State Legislature bill AB75, which required every large State agency to reduce landfill contribution by 25% by the year 2002 and by 50% by 2004. Both goals of these goals have been achieved.

The Main campus recycling program consists of partnerships between building occupants, Facilities Management, and the Associate Students Recycling program. These efforts combine to provide a large component of the recycling for the campus. All offices on campus have trash and office pack recycling. There are 73 recycling clusters strategically located across campus that act as convenient repositories where many types of materials can be recycled in the same place. The recycling clusters accept glass, newspaper, aluminum, and plastic. The clusters are maintained by AS Recycling, which is responsible for taking the recycled items by bicycle to the main recycling dumpster for Marborg (local trash provider) to pick up. In addition to these clusters, thirty-eight large cardboard recycling dumpsters, one super pack dumpster for recycling books and magazines, one 40-yard metal recycling roll-off, and a collection site for shipping pallet drop-off, pick-up, and reuse serve the campus community. Please see Appendix E for a map showing the locations of all recycling bins on campus.

Other waste, such as green waste, is turned into mulch off-site and returned to the campus grounds in landscaping. For detailed information about recycling and waste management on campus please see the following websites:

<http://facilities.UC Santa Barbara.edu/projects/recycling/>

<http://www.as.UC Santa Barbara.edu/recycling/>

Current successful practices in this area include:

1. Campus-wide waste audits and on-going measurement and verification
2. Campus Green Awards to recognize departments with exemplary recycling programs
3. Outreach to local grade schools and colleges
4. E-waste collection bins that are moved in cycles to acquire small e-waste from building

Housing Recycling Program & Food Waste Reduction Program- Housing & Residential Services recycles all dormitory and office solid waste as co-mingled materials (plastic, glass, aluminum, office pack), and also recycles electronics, used clothing, batteries, scrap metal, large appliances (refrigerators, stoves/ovens), and motor oil. The dining commons recycles used cooking oil which is converted to bio-diesel, and composts up to 90% of the vegetable waste and coffee grounds on-site. In some years over 100,000 pounds of kitchen waste have been diverted from landfills. At the end of the academic year and during renovations, furniture, mattresses, construction and demolition material, asphalt, concrete, packaging material, fluorescent light bulbs, ballasts, and all hazardous waste are sorted and recycled appropriately.

The success of the recycling programs at Housing is partially due to effective educational outreach. For the past ten years, H&RS has conducted a "Waste Awareness Week" campaign in the halls and dining commons during student move-in week. The program educates students about the goals and practices of

the H&RS recycling program and addresses questions regarding what items can be recycled in the halls and how to reduce food waste in the dining commons.

Current successful practices in this area include:

1. Extensive recycling program (that links back to the AS/FM program)
2. Education and outreach programs for “move-in” and “move-out”
3. Recycling contests between residence halls which use friendly competition to encourage positive awareness of recycling habits and waste prevention methods

Hazardous Materials Program- Environmental Health & Safety's Hazardous Materials Program assures compliance with all Federal, State, and local hazardous waste regulations through education, campus cooperation and implementation of practical and efficient policies while providing a cost-effective hazardous waste management program that protects the environment. Materials managed by EH&S includes chemicals, biohazards, radioactive materials and electronic waste such as batteries and lamps.

Current successful practices in this area include:

1. Free pick-up and transportation of waste materials from research laboratories to EH&S facilities
2. Specialized facility designed for proper handling and sorting of hazardous materials
3. On-going measurement and verification
4. Campus training and education
5. Adopt-a-Chemical Program

Construction Waste Management Program- Construction waste management on all new construction and major renovation projects must abide by the Division 1 Construction Waste Management Plan. The success of this plan is considerable, with a 90-98% diversion rate maintained over the past four years.

1.8.2 Mission Statement

Reduce and ultimately eliminate waste streams on the campus with the ultimate goal of a net zero waste campus through implementing “cradle to cradle” processes and practices.

To reduce the waste generated on campus every year by encouraging more sustainable purchasing, greater recycling, and decreased output of waste heat and greenhouse gases according to the dictates of Natural Step system.

1.8.3 Long Term Vision

The vision of this group is to create a net zero waste campus and to generate enough money from the Campus' waste to fund waste recovery and reuse project costs and research that will aid in further gains. **Zero Waste** expresses the need for a closed-loop industrial/societal system - waste is a sign of inefficiency. The use of the term Zero Waste includes "Zero Solid Waste", "Zero Hazardous Waste", "Zero Toxics" and "Zero Emissions". Zero Waste promotes not only reuse and recycling, but also, and more importantly, promotes prevention of waste generation - designs that consider the entire product life cycle. These new designs will strive for reduced materials use, use of recycled materials, the use of more benign (less toxic) materials, longer product lives, repairability, and ease of disassembly at end of life.

The term “**net zero waste**,” (what remains after all deductions have been made) implies that there will still be some quantity of waste we still need to address in 25 years. We expect that there will be some mitigation measures that will have to be taken to off set the differential.

1.8.4 Short Term Goals (0-1 years)

Goal 1. Characterize waste on campus and develop a Integrated Waste Management Plan.

Action Items

Action 1: Characterize and analyze existing campus data from the following points:

- a. Associated Students/Physical Facilities (AS/PF)
- b. Grounds
- c. Housing & Residential Services (H&RS) (Dining & Food services included in this)
- d. Design & Constructions Services Construction Waste (DCS)
- e. University Center (UCen)
- f. Water Management Team
- g. Environmental Health & Safety (EH&S)
- h. Central Stores/Business Services
- i. Physical Facilities/Campus Climate Neutral 2 Group Project
- j. Transportation
- k. Student Health

Action 2:

- a. Study/analyze the next step in the chain –where our recycling goes
- b. Take existing recycling plans and unite them into one plan
- c. As part of plan, identify reduction targets of 5-10% in waste (taking campus growth into account)
- d. Target other “simple” improvements that can be made based on #5 above
- e. Craft short- and long-term plan along with cost-benefit analysis for implementation. Present plan to CPC subcommittee on sustainability for implementation

Barriers

Data collection

Disparate reporting practices

Costs: Staff Time (best guess 40 hrs)

Start: Summer 2006

Finish: Winter 2006 / 2007

Gaps in data collection systems will be assessed and tracking systems will be modified to accurately account for these items and to consolidate data and characterize it to see where the biggest impact in reductions can be made in the first year. Part of this process will be to evaluate the waste stream with regard to the parameters of the Natural Step system.

Goal 2: Determine applicable regulatory framework.

Action Items

Action 1: Find and meet with experts in each area:

- a. AB75
- b. California Integrated Waste Management Board
- c. Air Pollution Control District (South Coast SB)
- d. EPA
- e. UCOP
- f. UCSB via USGBC (LEED system adopted by Chancellor)

Barriers

Regulatory Complexity (This is a barrier because each group or law may have multiple / conflicting goals and jurisdictions).

Costs: Staff Time (best guess 80 hrs)

Start: Summer 2006

Finish: Summer 2007

Goal 3: Set Waste Goals based on available data and regulatory requirements using the parameters of the Natural Step.

Action Items

Action 1: Set targets for percent reductions with constituents.

Barriers:

Data Formatting (This is a barrier because each campus unit may be reporting different types of things, and it will be important to bring the data into some form that is consistent and readable.)

Staff Availability

Costs: Staff Time

Start: Winter 2006 / 2007

Finish: Summer 2007

Goal 4: Perform year-end evaluation.

Action Items

Action 1: Submit an annual year-end evaluation report of campus waste programs that uses the most recently collected data to re-examine and update goals, action items, barriers, and costs.

Barriers

Staff time and easy access to data

Costs: Staff time, approximately 20 hours

Timeline: Begin October 2007 and complete by November 2007.

Goal 5: Develop funding sources for waste reduction projects

Action Items

Action 1: Work with Development, TGIF, and local and state government to obtain funding for waste reduction projects

Barriers

Time and amount of funding available

Timeline: Begin summer 2007, ongoing

1.8.5 Intermediate Goals (1-5 years)

Goal 1: Create the UC Santa Barbara Waste Management Plan.

- a. Work with Grounds Team and CCBER staff to assist them with improving practices on green waste to assess current practices and brainstorm ideas for improvements
- b. Work with Procurement team on printed material (catalogs received) reduction of 50%

Goal 2: Study solid waste cogeneration and determine feasibility.

Goal 3: Create Laboratory Waste Protocols by working with EH&S and LABRATS (Lab Research and Technical Staff).

Goal 4: Improve stormwater and waste water management:

- a. Work with Physical Facilities, H&RS, EH&S and Water Team to craft short- and long-term plan for improving the quality of storm water/waste water/sea water systems

Goal 6: Working with the Procurement Team implement changes in systemwide agreements:

- a. Craft plan and strategy to implement packing reductions and equipment/furniture/ and chemical take backs programs
- b. Craft plan to increasing post-consumer product offerings

Goal 7: Complete a “close the loop-study”

- a. assess ways to partner with individuals, companies, NGO’s to create next step in the process for re-use of our waste – create incentives for research in this area

1.8.6 Long Term Goals (5-10 and 10-20+ years)

Goal 1: Continue to work on emissions reductions.

- b. Implement clean fuel strategies for generators
- c. Work with Transportation Services for clean/alt fuel fleet implementation
- d. Waste heat recovery implementation

Goal 2: Implement findings from Intermediate Goal # 2 in new construction protocols.

Goal 3: Continue to improve efficient use of chemicals in laboratories.

Goal 4: Continue to work on Stormwater Quality Plan, which outlines measures to ensure all water leaving campus site is pollutant-free.

Goal 5: Continue work with Food group to fully implement food waste reduction program which stipulates a 50% reduction in food waste in 5 to 10 years, an 80% reduction in 10 to 20 years, and a 100% reduction in 20 to 25 years.

Goal 6: Implement findings from #1 above and create profitable way of dealing with our waste

Goal 7: (5-10 yrs) 50% reduction in total weight (per capita) of campus waste

Goal 8: (5-10 yrs) Identify and remove or replace the most environmentally problematic waste leaving campus

Goal 9: Study ways to eliminate balance of waste from the campus – create implementation plan

Goal 10: (10-15 yrs) 80% reduction in total weight (per capita) of campus waste

Goal 11: (20-25 yrs) 95% reduction of total weight of campus waste

Goal 12:(25-30 years) 100% reduction of total weight of campus waste

1.9 WATER

1.9.1 Current Sustainable Practices

Water Efficiency

UC Santa Barbara began implementing water conservation strategies in response to droughts in the early 1980's. Since that time, water efficiency has been factored into project planning at the earliest stages. Customary water saving strategies in campus buildings includes incorporating low-flow faucets, flush valves, and showerheads that significantly reduce water usage. In 2001 the campus began installing waterless urinals and dual flush toilets to reduce water use even further. The campus also has ongoing measurement and verification of campus water use. Please see indicator spreadsheet for metrics.

With the Clean Energy and Green Building Policy in place, all new construction at UC Santa Barbara strives to achieve LEED Silver, which has five possible points in the Water Efficiency category. In 2003, the Sustainability Working Team completed an assessment of LEED-NC and recommended that all five points in the water category should be pursued as campus standard. This would diverge from the LEED process in that typical LEED registered projects are not required to receive all five water points, and are instead allowed to choose any level of water efficiency.

The LEED-NC Water Efficiency points are:

- Water Efficient Landscaping – reduce by 50%
- Water Efficient Landscaping – No potable water use or no irrigation
- Innovative Wastewater Technologies
- Water Use Reduction - 20% Reduction
- Water Use Reduction - 30% Reduction
- Water Use Reduction - 40% Reduction

Landscaping and Irrigation

UC Santa Barbara has been using reclaimed water to irrigate the campus grounds since 1994. Currently, reclaimed water for irrigation reaches approximately 93% of campus. The campus has also invested in an automated irrigation system that is controlled by a weather station located on campus. The controls automatically notify the weather station on the status of evapotranspiration levels at various locations on campus. The landscaping is only irrigated when these levels are low to avoid over-watering plants when it is unnecessary. Plans include capturing the balance of the campus irrigation system with reclaimed water within the next 2 fiscal years. In addition, UC Santa Barbara grounds department uses drought tolerant native/adaptive plants and trees, such as ceanothis, lantana, and tipuana, which use little water and require minimal maintenance to reduce the campus' water requirements from the outset.

In addition, Housing has an existing water conservation plan which outlines several ways to reduce water use, including reduction in turf, incorporation of recycled water, and advanced central irrigation programs.

Water Quality

The campus has a general stormwater control plan. For the past seven years, the campus has maintained fossil filters in most construction projects. With the practice of achieving LEED Silver on all new construction projects, there is a requirement for site protection that requires all projects to use filters, hay bails, and tarp materials to keep particulates from exiting the site. There are approximately 50 or 60 fossil filters currently in place. Stormwater planning is approached in two ways. On a small scale, each construction project is required to plan and implement a stormwater system that feeds into the larger campus system. The second level is planned on a campus-wide scale. The main campus has been divided into four zones to address end of source treatment. The areas identified for this process are the slough on the north side, the lagoon on the south side, wetland and bioswale on the west side, and the ocean bluffs on the east and west sides. The end of source treatment will remove solids and debris. Physical Facilities also cleans all road and parking lot surfaces on a weekly basis to improve the water quality exiting the campus.

1.9.2 Mission Statement

The Water group will provide the campus with leadership and guidance for sustainable water use by:

- Working closely with PF/CCBER/H&RS on planning and implementing water conservation measures and a water management plan.
- Updating standard campus procedure to include achieving all LEED-NC and LEED- EB points under the Water Efficiency category.
- Providing information about water use and its global environmental impact to campus constituents.
- Revisiting campus water contracts to see where improvements can be made in the short- and long-term.
- Assisting with water related policy creation and implementation.
- Coordinating with Landscape group to ensure plants used on campus have minimal water needs.
- Coordinating with the Academics and Research group to see where water issues can be integrated in the curriculum. Propose “plants as a learning lab” approach to using campus landscaping and grounds as a teaching tool.
- Coordinating with the Procurement group to see where we can improve purchasing practices regarding water efficient supplies and equipment.
- Coordinating with the Waste group to address “best lab practices for microchemistry” to reduce water use.

1.9.3 Long Term Vision

All potable water will be garnered from within the campus footprint for first use, re-processing, and re-use. All stormwater will be treated onsite to ensure it exits the site in an unpolluted state. All seawater used on campus will re-enter the marine environment in a non-invasive state to negate the impact on local marine life. This will require that the water is unpolluted and at an appropriate temperature.

1.9.4 Short Term Goals (0-1 years)

Goal 1: Gather and assess missing data for three water types: potable, reclaimed, and stormwater.

Action Items

Action 1: Complete gap analysis by reviewing water metering data and water indicators to determine where information is lacking (i.e. west camps, apartments, FT, reserves, stormwater).

Barriers

Barriers include disparate sources of data collection, and the possibility that points data isn't currently metered.

Cost: Staff time

Timeline: Begin fall 2006 and complete by the end of winter 2007.

Goal 2: Make recommendations for information tracking systems and assess additional metering needs for monitoring water use of all types.

Action Items

Action 1: Create a list of metering systems that must be installed to accurately collect water data.

Action 2: Identify software required to improve data collection.

Barriers

Barriers include staff time and lack of information.

Cost: Staff time; Funding for additional sub-metering may be required and there will be expenses associated with their purchase and installation. A rough estimate of \$1000 per meter is reasonable, however the quantity of meters that will be required is unknown at this time. Additionally, additional software may be required to assist in the collection and retention of data which will add further costs.

Timeline: Begin March 2007 and complete by June 2007.

Goal 3: Work with the Campus Sustainability Manager to implement campus standard for LEED-NC and LEED-EB to achieve all available points in the water category.

Action Items

Action 1: Meet with the Sustainability Manager to review LEED-NC and LEED-EB Water Efficiency category and begin assessing the challenges to making the implementation of these points a standard.

Timeline: Begin fall 2006 and complete by spring 2007, with a list of recommendations ready to present to the CPC by January 2007.

Action 2: Present information and recommendations to the CPC.

Timeline: Present to the CPC in January and respond to any questions or concerns by March 2007.

Action 3: Create a document of CPC recommendations and submit to the Chancellor for implementation.

Timeline: Present the recommendations to the Chancellor by the end of spring 2007.

Barriers

Unknown until discussions begin.

Cost: Staff time

Goal 4: Provide water consumption data from campus metering to the public via the Sustainability website located at www.sustainability.ucsb.edu.

Action Items

Action 1: Set up beta site for water information on the web.

Barriers

One barrier is possible time constraints on the part of Computer Network Technologists.

Cost: Staff time

Timeline: Begin in fall 2006 and complete by January 2007.

Goal 5: After data is collected and assessed, update the reduction targets, budget for achieving these goals, and goals for reclaimed water use. Reduction targets for potable water are listed below.

Action Items: Work with constituency groups to review data we are able to collect and set targets for reductions.

Barriers

Barriers include availability of constituency group members.

Cost: Staff time

Timeline: Begin March 2007 and complete by June 2007.

1.9.5 Intermediate Goals (1-5 years)

Goal 1: Create a water management plan.

Action Items

Action 1: Use the information collected in year one and work with constituency groups to craft a 1-5 year water management plan for the campus. Revision of this plan will become an Intermediate goal.

Barriers

Availability of constituency group members and the possibility of divergent interests are potential barriers.

Cost: Staff time

Timeline: Begin in March 2007 and complete by September 2007.

Goal 2: On an annual basis, conduct a reassessment of goals based on the findings of studies completed the prior year. This would include reporting on interconnected goals with the Landscape team, the Academics & Research team, and the Waste team.

Action Items

Action 1: Complete an annual report by the end of August each fiscal year. Review data to see where we can make the most cost-effective improvements. On an annual basis, make recommendations to the appropriate committee in fall quarter.

Barriers

Staff turnover and organizational structure are potential barriers.

Cost: Staff time

Goal 3: Hire a consultant to perform a hydrologic feasibility study of the campus.

Action Items

Action 1: Hire a consultant to perform a study of the campus, including these critical issue areas:

- Determine if it is feasible to collect enough water within our 1,000 square acres to supply the campus with adequate water for its operational needs.
- Assess feasibility for water collection system and identify best locations.
- Identify best locations (most efficient space use) for bioswales.
- Assess feasibility of capturing ground water (the water moving laterally across the campus) for use (and that our collection of this water will not negatively impact the ecosystem).
- Conduct feasibility study of capturing ground water currently being pumped off site from under Bren Hall and the Psychology Addition. Assess the condition of this water and our ability to cost-effectively re-use it on site.
- Assess collection of end of point bioswale water for re-use on campus.

Barriers

Potential barriers include: water quality issues; existing conditions underground (old tanks etc); lack of funding for the study; and unknown legality issues in various proposed projects.

Cost: A rough cost estimate for this goal is \$150,000.

Timeline: Begin in winter 2008 and complete by fall 2008.

Goal 3: Reduce potable water use from off campus by 15% (1-3 yrs) and 25% (3-5 yrs). Increase reclaimed water use by 15% (1-3 yrs) and 25% (3-5 yrs). Work with PF/UCen/H&RS/CCBER on implementing water efficiency strategies for the campus based on the new water management plan.

Action Items

Action 1: Set work with constituency groups for the year along with cost estimates. Meet with appropriate Senior Management personnel to gain their approval of proposed budgets for implementation of upgrades and modifications.

Barriers

Funding may be an obstacle to achieving this goal. Political structure and boundaries may also pose barriers.

Cost: Actual cost will vary by fiscal year as list is identified

Timeline: Each year will begin July 1 and conclude December 31; the assigned reduction in potable water use will occur within this time frame on a yearly basis.

1.9.6 Long Term Goals (5-10 and 10-20+)

Goal 1: Reduce potable water from off campus use by 50% (10-15 yrs) – provide 50% of our potable water from on-site generation (10-15 yrs)

Goal 2: Reduce potable water from off campus use by 75% (15-20 yrs) – provide 75% of our potable water from on-site generation (15-20 yrs)

Goal 3: Reduce potable water from off campus use by 90% (20-25 yrs) – provide 90% of our potable water from on-site generation (20-25 yrs)

Goal 4: Reduce potable water from off campus use by 100% (25-30 yrs) – provide 100% of our potable water from on-site generation (25-30 yrs)