Rainshadow Community Charter High School Sustainability Plan Proposal

April 1, 2011

Section 1: Statement of Need

The future of public schooling in Nevada is uncertain. Funding for public education is being slashed as our economy continues to diminish. Our environment continues to suffer as the human population increases exponentially. Sustainability means that we must meet our current needs without inhibiting the ability of the future generations to meet their needs. That means that we have a big job ahead of us. Sustainability begins within us, our families, and our communities.

We believe that Rainshadow Community Charter High School is the perfect place to serve as a model for sustainable practices, a sustainable education resource, and a self-reliant school. We want Rainshadow to eventually be a completely self-reliant school so that the future students of Rainshadow will be able to obtain a great alternative education. The needs of our school are very simple, adequate funding, nutritious food, renewable energy, clean water, access to supplies, community support, and enthusiastic students, teachers, staff who want to make a change in this world.

This plan will address the sustainability of three basic needs of our school. We will discuss how we will increase school revenue in this time of economic crisis, how we can supply ourselves with adequate nutritious food for the future students of Rainshadow, and how we can decrease our reliance on fossil fuels and increase our use of alternative energy for a carbon neutral future.

Since funding, food, and energy are three of our major, basic needs, it makes sense to focus on them as we plan for a sustainable future. The rationale for these needs is simple. Public funding for education is currently being reduced at all levels in Nevada. It is not out of the question that

the folks in charge would cut all funding to charter schools in Nevada. This would mean the end of Rainshadow as we know it. We must find creative and effective ways to reduce spending, save money, and even make money for our school's future. A sustainable community means a local-food based community. The average piece of food travels over 1500 miles before it gets to our lunch plates. With the current increase in fuel and transportation costs, the price of food has gone up in our supermarkets recently, and is expected to rise further. It makes sense for Rainshadow to begin to feed ourselves. With determination and community support, we can be the school that not only feeds ourselves, but also supplies local restaurants with fresh produce and distributes surplus to local people in need. Our culture must shift away from a fossil fuel burning energy economy to a renewable energy future. Right now, Nevada gets a small fraction of the energy that we use from renewable energy sources such as geothermal, solar, hydroelectric, and wind. The rest comes from harmful, pollution coal, oil, and natural gas burning plants. Rainshadow currently has a 30 kWh solar array installed on our roof, but there is so much more we will do to reduce our energy consumption and be a stronger advocate for renewable energy.

Not only will these three important needs be addressed in our school sustainability plan, but addressing these needs will benefit our community and help it thrive and become sustainable as well. Rainshadow is an educational institution and we will be laying the groundwork for future generations of Rainshadow students to learn about sustainability at school and be able to

incorporate sustainable principles into their lives. Our plan will help save the environment by reducing our consumption of fossil-fuel based energy, thus reducing our impact on the planet's climate. We will produce our food locally, right here on our school grounds, while at the same time create habitat for the plants and animals that are native to the high desert. We will be empowering our community by taking action towards sustainability. Rainshadow must be around in the future so that Reno's youth will be empowered to take action in their community while receiving a great education through real-world activities.

Section 2: Goals and Objectives

The overall goal of our sustainability plan is for Rainshadow to eventually become a completely self-reliant school: a school that can function completely and efficiently with the population of students, teachers, staff, and local community resources available at any given time. Since this will take a very long time to achieve, our three specific and immediate goals are to establish on-campus food growing facilities that will allow us to produce enough food to feed our population of students, significantly reduce our reliance on fossil fuels by establishing renewable energy sources thus reducing our overall energy consumption by 30%, and to increase our school funds to eliminate the risk of losing our school and achieve financial sustainability.

Our first objective is to create food production facilities right here on our campus. This objective will help us meet all three of our goals. We will be producing food organically and sustainably, we will use local resources, and we will recycle food waste by composting. The facilities will include a rooftop greenhouse with an aquaponics system made from mostly repurposed materials capable of producing food year-round; a food forest on-campus that will produce fruit, berries, and grapes for seasonal harvest; and a seasonal garden capable of growing produce during

Reno's short growing season with the aid of a hoophouse. We will also use an existing water terrace structure as an additional seasonal aquaponics system to produce fish and vegetables and will compost food waste both with vermiculture and traditional composting methods. The food that we grow will be used for healthy, fresh, and tasty school meals as well as in the Rainshadow Pizzeria that we hope to re-open with a local food focus. Excess fruit such as grapes will be turned into value-added products such as raisins, jams, and juice. Grape vines will be strategically placed to supply the west side of the school with shade in the summer months to reduce our cooling costs. Surplus food will be sold to local restaurants and businesses to help raise money for school field trips and other activities. By growing our own food we reduce greenhouse gas emissions that happen when food is trucked in from long distances and we help save world from global climate change.

Our second objective is to significantly reduce our dependence on fossil fuels by reducing our overall energy consumption by 30%. We want Rainshadow to utilize as many renewable energy sources as possible to minimize our use of non-renewable fossil fuels. We already have an amazing photovoltaic solar array that helps us reduce our reliance on power from the grid, but we can do so much more to reduce our energy consumption right here at school. We want to implement simple energy saving features throughout the school that will reduce our impact of the planet's atmosphere. We want to install smart-strips in the computer lab, motion-sensor lights in

the restrooms, adjust the thermostats seasonally, utilize passive solar heating, and implement a policy of minimal energy drain when our school building is not in session.

Our third objective is to increase our school funds to achieve financial stability, which would eliminate the risk of losing Rainshadow and lead to becoming a completely self-reliant school. Completing our first two objectives will help us make serious strides toward financial sustainability.

Section 3: Project Activities

To accomplish our three goals and meet our objectives, we have established support from our school and community members, and have established a timeline for the implementation of our plan.

In order to make Rainshadow a sustainable operation, we must seek support from within as well as from our community. We have the privilege of having an extremely small school with a set of dedicated teachers and administrators that work closely together. They have all pledged their support for a more sustainable, green, and ecologically friendly future for their school. They have agreed to implement sustainability principles into the core curriculum of the school and to utilize the school and the features that this plan proposes into the education of future Rainshadow students.

We have also met with and been granted support from a wide variety of community members. Joanna Furgiuele and Sean Hill from Sierra Nevada Journeys met with us and said that they would continue to help us work collaboratively to make sure our plan is successful. Mark Hebert, local aquaculture volunteer, gave us guidance and pledged continued support in helping us design, build and implement a rooftop greenhouse and two aquaponics systems. David Gibson

from Envirolution helped us understand our energy use and misuse and has agreed to help us integrate the school-wide energy saving features in our plan. Lynnae Fischbach from Urban Roots Garden Classrooms helped us dream up a plan to grow food on our school campus and has agreed to help us produce food for our school kitchen. Neil Bertrando, local permaculturalist, helped us understand the principles of permaculture and how we can implement those principles into our plan for total sustainability well into the future. Jana Vanderhaar, local sustainable landscape designer gave us valuable site-design ideas to help us plan our food forest and will help us implement our site-plan. Marnee Benson from Black Rock Solar talked to us about how much money we could save our school by reducing our energy consumption and how that money could be used for further projects towards sustainability. We are grateful for all of the support elicited by these community members and look forward to working with all of them in plan implementation.

The steps that we will take to implement our plan and meet our objectives are as follows:

April 1, 2011: Submit High School Sustainability Plan Proposal

April 22, 2011: Earth Day Presentation of Sustainability Plan

April 25 - May 10, 2011: Greening of the Rainshadow Kitchen and Café.

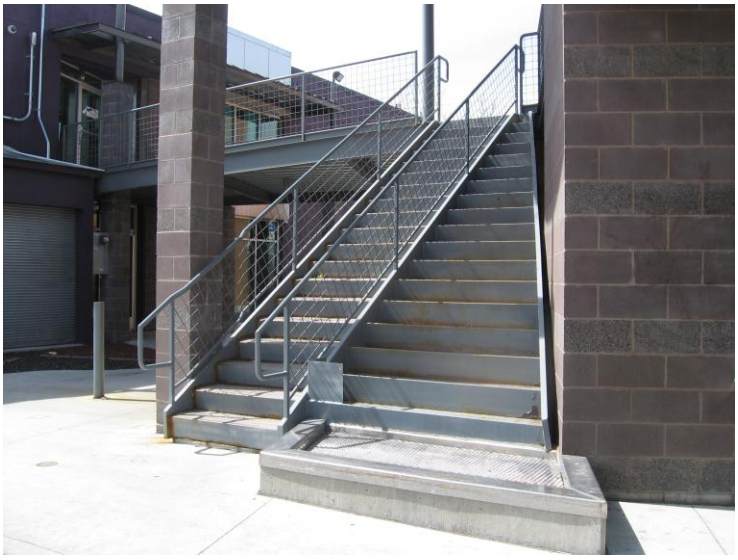
1. Replace the use of wasteful styrofoam plates with existing ceramic plates for school lunches by determining a feasible solution to the dishwashing dilemma. 2. Create and initiate a Rainshadow Reusable Mug Incentive Program to reduce the Rainshadow Café's waste of disposable coffee cups. 3. Implement a comprehensive food waste composting program in the kitchen and café. 4. Start vermiculture composting.

May 10 - 20, 2011: Implement and Install Energy Saving Program.

1. Purchase and install motion-sensing hand-blowers and lights in the four restrooms. 2. Purchase and install smart-strips in computer lab to stop energy waste. 3. Adjust thermostats to ensure efficient use of air conditioning. 4. Create student "energy police" team to monitor and correct energy wasting.

May 15 - June 1, 2011: Begin Campus-Wide Food production.

1. Investigate and amend irrigation system issues. 2. Obtain and plant fruit trees, berry bushes, and grape vines in designated areas. 3. Establish aquaponics system adjacent to main entrance stairway. 4. Design and plan rooftop greenhouse. 5. Begin on-campus seasonal food production for a fall harvest.



June 1, 2011 - September 1, 2011: Obtain Materials for Rooftop Greenhouse Construction.

1. Obtain re-purposed window panes, wood, and other construction materials for rooftop greenhouse construction.

September 1, 2011 - November 1, 2011: Students construct rooftop greenhouse and aquaponics system as part of Rainshadow's fall interdisciplinary curriculum.

November 1, 2011: Re-Open Student-Run Rainshadow Pizzeria.

1. Re-open the Rainshadow Pizzeria with student employees and campus-grown local food.

2012 and Beyond: Move Rainshadow toward complete self-reliance.

Site Plan

- Fruit trees on south side of building adjacent to Vesta. Wind block and fruit production.
- Fruit trees, berry bushes, and native plants around south parking lot.
- Grape vines and vermiculture condo on west side of building.
- Greenhouse with aquaponics system on north side of roof.
- Seasonal aquaponics system on north side of building adjacent to stairway.
- Fruit trees on north side of north parking lot adjacent to Pueblo St.
- Seasonal garden, compost facility, and hoophouse on northeast corner of north parking lot.
- Berry bushes on east side of north parking lot.

Section 4: Budget

Rainshadow will fund our project by concentrating on asking local businesses for specific donations, asking people in our community to help us find and obtain inexpensive building materials, and spending money only when absolutely necessary and when the return on investment is great. We will be as resourceful as possible. By not spending money on new things when we can find reusable and repurposed materials, we are helping reduce waste and helping the environment.

It will also help us put that saved money into other ideas we have for sustainability. See spreadsheet below for itemized list of proposed expenses.

Expenses:

(Goal 1: Food Sustainability)

Date:	Item:	Description / Explanation	Amount	Source:
Apr-11	Straw Bails	10 Straw bails for composting	$80.00	Green's Feed
Apr-11	Vermiculture Bin	Our worm condo	$134.00	composters.com
Apr-11	Red Wigglers	2000 worms	$40.00	unclejimswormfarm.com
May-11	Schoolyard irrigation supplies	Hosing, valves, TBD	$200.00	Irrigationdirect.com
May-11	Fruit Trees	20 Apple, Peach, Plum, Cherry, Apricot, etc.	$600.00	Drycreek Garden Co.
May-11	Grape Vines	10 Grape Vines	$200.00	Drycreek Garden Co.
May-11	Berry Bushes	20 Raspberry, Blackberry, etc.	$200.00	Drycreek Garden Co.
May-11	Fish and Aquatic Plants	For outdoor aquaponics system	$300.00	BackyardAquaponics.com
May-11	Seedlings for Seasonal Crops	Various seedlings to plant garden	$150.00	Local vedndors
Sep-11	Materials for Rooftop Greenhouse	Windows, Woods, Screws, Irrigation, etc.	$5,000.00	Local donors, hardware supplies

(Goal 2: Energy Sustainability)

Date:	Item:	Description / Explanation	Amount	
May-11	4 Motion Sensor Lights	$67 each to auto shut off restroom lights	$268.00	WestsideWholesale.com
May-11	4 Motion Sensor Hand Dryers	$355 each energy efficient model	$1,420.00	CentralRestaurant.com
May-11	10 Smart Power Strips	$40 each with autoswitching technology	$400.00	Bitsltd.us
		TOTAL:	$8,992.00	

Revenues (Note: Revenues should equal or exceed the project expense)

Date:	Item:	Description / Explanation	Amount	Source:
	School fundraising			
	Rainshadow Foundation	501c3 Contribution	$1,000.00	Philanthropists
	In-Kind Contributions			
	Repurposed Window Panes	For Rooftop Greenhouse	$2,000.00	Local Window Suppliers
	Profits generated			
	Vegetable Sales	Selling Surpus Veggies, Fruit, Fish	$1,000.00	Sales to Restaurants
	Pizzeria Profits	From Student-Run Pizzeria	$1,000.00	Pizza Sales
		Subtotal:	$3,000.00	
	GREENevada Project Request		$5,992.00	
		TOTAL:	$8,992.00	

Savings created by the project:

Date:	Item:	Description / Explanation	Amount
	Estimated Savings to the school		
	Energy Savings	Motion Sensors, Energy Police, smart strips, etc.	$12,000.00
Will they let these savings go back to your project? (yes/no/don't know)			No

Section 5: Impact Analysis

We believe that our plan will have a great positive impact on our local community, future Rainshadow students, and our world. We want to use this plan to educate people about striving for a sustainable world and will measure our success based on how many community members learn about sustainability from us and implement it into their lives. We believe that when future Rainshadow students learn about producing food locally and sustainably and significantly reducing their use of fossil fuel-based energy, we will be moving our community and world toward complete sustainability. We want to be an example of sustainable design and enterprise. We want to be a model to other schools so that they will make the same changes toward sustainability. With our plan, we will save significant amounts of money by producing and selling our own food, and by reducing our energy bills every month. We want to eventually become a completely self-reliant school. We want this world to be a better place for our children and their children.

The drawbacks to our plan are that making changes can be difficult and spending money upfront can be hard since we won't see instant results. We will need to wait to see the full benefits of our food forest, greenhouse and aquaponics, and energy savings. Most of us are seniors this year and we will be graduating soon, so it will be up to the future Rainshadow students to keep up the tradition of sustainability. In the long run, the upfront costs will be worth spending because the benefit will be felt throughout the years to come.