



AN INTERNSHIP AT THE GRAND CANYON TRUST

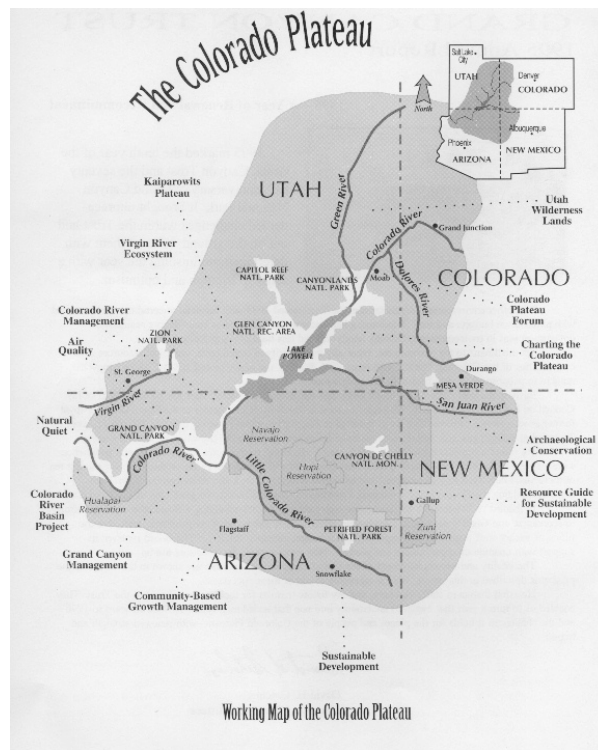
Ric O'Connell, Environmental Studies
Prepared for Professor Paul Komor

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I. Introduction

The stars were ridiculously bright, and the crisp night air sharp and invigorating. The sky was black as only a sky that is hundreds of miles from any city can be, rare in these times. I lay back and grinned, wondering just what had brought me here, to a rooftop in a Hopi Village on this cold July night. I was sleeping on the roof of my hosts, the Masayeva's, whose house is just outside of Oraibi: the oldest continuously inhabited place in North America. The Hopi were living here in 900AD, when London was a mere muddy village on the Thames.

This paper will try and chart the course of how I ended up on that roof, and more specifically how I spent my summer internship working for the Grand Canyon Trust. In the process, hopefully I can shed some wisdom on the process of obtaining a graduate internship, what its like working for an environmental organization, and perhaps even some wisdom on renewable energy.



II. Journey to the Colorado Plateau

I was introduced to the Colorado Plateau in grade school in New Mexico, where I learned about this physiographic region that covers much of Utah, Northern Arizona, and northwestern New Mexico. I lived for a year as boy in Farmington, just outside the Navajo reservation and squarely on the plateau. I was also fortunate enough to visit Chaco Canyon, and learn about the native heritage as well as the spectacular vistas of this gorgeous country. The Plateau remained in the back of my head as my life unfolded, and in November of 2003 I returned to this amazing country to visit a dear friend who was working for the Indian Health Service in Shiprock, just outside Farmington.

A. Visiting the Plateau

We drove through the red rock country to Canyon De Chelly, where we slept in a Navajo Hogan and marveled at the beauty of the country. We traveled to Monument Valley and through the stunning and barren land around the San Juan River, through the little towns of Mexican Hat and Bluff. From the San Juan, we visited the incredible Anasazi ruins at Hovenweep – an undiscovered gem in the National Park system.

It was an event at the beginning of this trip, however, that really spurred my desire to study this remarkable country. Our first night, we had dinner in Farmington, and then drove the thirty miles to Shiprock. On the way, we passed two giant coal-fired power plants, San Juan and Four Corners, hulking and bright, one on either side of the highway. These enormous plants were just outside of the reservation, built in the late 1960s to power cities like Los Angeles, Phoenix, and Albuquerque¹.

¹ There are plans to add another three plants, and 2GW of capacity, in this fragile area. http://www.durangotelegraph.com/04-04-15/cover_story.htm

Here in this fragile and beautiful area, everything came together in a terrible confluence: hydropower on the Colorado river, coal-fired power plants for the mega cities of Phoenix and Southern California, tribal land and economies. It was all there – and I wanted to understand it.

B. Mohave

I returned to Boulder and threw myself (despite looming final exams) into learning everything I could about energy and the plateau. It was soon clear that conflict over energy had come to the plateau in a particularly complex way. This conflict had a name: Mohave. In the history of dirty coal plants, Mohave has a

special place. It was built in the late 60s, coming online in 1971 (critically, before the Clean Air Act). It is supplied with a 273-mile long coal slurry line, which takes coal and water from the Black Mesa mine on the Hopi and Navajo reservations. At the time, the idea of a coal slurry line was considered cutting edge. It remains the only slurry line in the world.



**Figure 1 - Mohave
Generating Station
(Courtesy Southern
California Edison)**

The plant is in Laughlin, Nevada, which is in the southern tip of Nevada. It is jointly owned by various Utilities, with the majority owner Southern California Edison, but with stakes owned by Los Angeles Department of Water and Power (LADWP), the Salt River Project, and others. The plant was located in Laughlin for two reasons – proximity to southern California and transmission, and distance from the reservation. Both the giant Navajo Generating Station (NGS – next to Glen Canyon Dam) and Mojave get their coal from Black Mesa – but neither plant is on the reservation².

² Navajo gets its coal via an electric train.

Mohave's slurry line uses 3,500 acre-feet (over 1.1 billion gallons) of water per year, taken from a pristine aquifer in this incredibly arid country. The amount of water used to ship coal is more than the entire Navajo and Hopi nations use for all purposes. Mohave was also built with scant pollution control equipment; it has only electrostatic precipitators to remove particulate matter. This lack of pollution control equipment would prove the beginning of the end for Mohave. To further complicate matters, the operators of Black Mesa mines received incredibly low royalty rates for coal and water from the tribes, due to the duplicity of the lawyer representing the tribes (John Boyden) who was secretly working for Peabody coal³.

In 1999, the Grand Canyon Trust, the Sierra Club and the National Parks Conservation Association entered into a consent decree with the owners of the Mohave. Mohave was responsible for much of the air pollution in the Grand Canyon, and the consent decree mandated the plant had to be fitted with best available technology for SO₂ and NO_x removal by the end of 2005.

After long and complex negotiations under the jurisdiction of the California Public Utilities Commission (PUC)⁴, tribal negotiations, Utility infighting, and even the Department of Interior involvement – it looks like Mohave will be shut down at the end of this year⁵. When the Mohave plant shuts down, the Hopi tribe will be hard hit financially. Most of their annual royalties from Peabody coal will stop when the mining at Black Mesa is curtailed.

C. My Involvement

I learned as much as I could about this fascinating conflict, reading PUC hearings and any material I could get my hands on. I then contacted various

³ See Charles Wilkinson "Fire on the Plateau" for the full story of Boyden's treachery.

⁴ The CA PUC has jurisdiction in the matter because the majority owner, Southern California Edison, is regulated by the PUC. Any major expenditure by Edison would require a rate hike, which needs approval by the PUC.

⁵ The California PUC ruled 5-0 on December 14th, 2004 to shut Mohave.

organizations, such as the PUC office of ratepayer advocacy, the Natural Resources Defense Council (NRDC) and others to offer my help. Through the NRDC, I was put in touch with the Grand Canyon Trust, one of the original plaintiffs in the Mohave case. The Trust was interested in finding alternative revenue for the tribes; revenue that was not coal based and instead came from renewable energy.

I jumped on the chance, and proposed a feasibility study for a renewable power plant on Hopi and/or Navajo lands. It was the spring of 2004, and I was in a class on renewable energy policy. My professor required a policy project that had a real client, and it appeared I had my topic and my client.

For the class and the Trust, I wrote a feasibility study of putting a solar power plant on Hopi land. I worked through the technical issues, the transmission issues, and the economic feasibility. The plant was to be rather small – three to six megawatts, and would cost ten to twenty-five million dollars.

I was also taking a law class with Charles Wilkinson, a distinguished faculty and the Chairman of the Board of the Grand Canyon Trust. My class project for the Trust as well as the goodwill of Charles led to the Trust offering me an internship for the summer at their headquarters in Flagstaff. I was going back to the Plateau!

III. The Grand Canyon Trust

The Trust is a unique and powerful environmental organization, with a mission “*to protect and restore the Colorado Plateau – its spectacular landscapes, flowing rivers, clean air, diversity of plants and animals, and areas of beauty and solitude.*”⁶ The Trust has an influential and distinguished board of

⁶ www.grandcanyontrust.org

trustees⁷, and a unique focus on a particular geographic region. While many organizations are either national or local in scope, the Trust focuses on a relatively large region. It is more akin to Western Resource Advocates⁸ than a small local organization or a giant national one.

The name “Grand Canyon Trust” is somewhat misleading. The group works in a much greater range than simply the Grand Canyon, and it is not a land trust like the Nature Conservancy or the Trust for Public Land, but a multifaceted environmental organization. The Trust is headquartered in Flagstaff, AZ – the largest town (at a mere 50,000 souls) on the plateau – with a small field office in Moab, UT.

The Headquarters of the Trust is in an old, beautiful ranch house on the northern edge of Flagstaff. The office space is shared with the Nature Conservancy. There are two pole-mounted solar panels on the property (see picture). The location is



Figure 2 - Trust Headquarters (Note the solar panels)

excellent, as you can see from the photo; the mountains are right behind the office, with some of the best mountain biking in the country minutes away.

A. Staff and focus

The Trust has a staff of about twenty, with specific program areas in energy, water, forests, land conservation, and Native American affairs. A program director works almost exclusively on each particular area, with great

⁷ <http://www.grandcanyontrust.org/about/board.html>

⁸ A Boulder based environmental organizations with a focus on the intermountain west. <http://www.westernresourceadvocates.org/>

autonomy. The Trust also has a director of communications and an administrative staff. While this may not be true with all environmental organizations, there wasn't much communication within groups, and it was often hard to know what projects other staff members were working on.

The Trust hires attorneys and other specialists on an as-needed basis for specific projects or lawsuits. This was particularly apparent with the energy program.

I worked most closely with Rick Moore, the energy program director, but I also worked extensively with Tony Skrelunas, the director of the Native American program. Rick is also the associate director of the Trust, and spent much of his time working on administrative and other issues, leaving me to fend for myself. Tony was also very busy traveling, so it was difficult to track him down. As a result, I was mainly left to my own devices, which is a common experience for an intern.

The Native American program is a new direction for the Trust, and is somewhat different than the traditional focus of an environmental organization. The program focuses on creating sustainable (both economic and environmental) businesses on tribal lands. Tony was the economic development director for the Navajo nation, and has incredible experience and contacts on both the Navajo and Hopi reservations.

B. The Trust's Clean Energy Program

The clean energy program at the Trust had an historical focus on litigation and procedural hearings (such as PUC appearances), mainly targeting the numerous coal-fired power plants around the plateau. Mohave has already been mentioned, but the Trust also worked with Salt River Project to clean up Navajo generating station. The Trust has two active cases, one over PNM (Public Service

Co. of New Mexico) over the San Juan power station⁹, and the other regarding Tucson Electric Power's Springerville coal plant¹⁰. These cases all used Reed Zars, an outside attorney, as lead counsel.

This focus on litigation meant the Trust didn't have much energy left over for renewable advocacy. While the Trust was tangentially involved in some of the Renewable Portfolio Standard (RPS) work in Arizona, it has not taken a leadership role in renewable energy, instead focusing on the immediate problem of dirty power plants. This strategy made sense, as the plateau is sparsely populated, but home to a handful of old and dirty coal plants. But as the litigation has wound down, and the number of plants left to clean up has dwindled, the organization is trying to refocus efforts on renewables. The plateau is under pressure from a new round of coal plant proposals, and advocating renewables goes hand in hand with contesting new coal plants.

IV. My Task at the Trust

My position at the Trust was to work with Tony and the Native American program as well as the clean energy program to continue my work on the renewable power plant proposal for the Hopi. I continued to refine the technical feasibility, but most of the work was done thinking about how to fund such a huge project.

One of the joint owners of the Mohave plant is the Los Angeles Department of Water and Power (LADWP) which owns ten percent of Mohave (it recently sold a ten percent interest to the Salt River Project). LADWP receives about 50% of its power from coal, most of which is located in Utah, Nevada and Arizona, and much of it from tribal coalfields. Historically, the tribes were underpaid for their coal royalties, providing Los Angeles with cheap power throughout the 1970's and 1980's.

⁹ <http://www.grandcanyontrust.org/press/archive/pro51602.html> The Trust recently scored a victory in NM district court.

¹⁰ <http://www.westernresourceadvocates.org/energy/arizcoal.html> The case is still active.

The Los Angeles city council, which is the governing body of LADWP, is considering an RPS for LADWP. As part of that RPS, the Grand Canyon Trust was proposing a “set aside” that a percentage of LADWP’s renewable energy comes from tribal lands. This “set aside” would provide much needed revenue for the tribes when the coal royalties end at Mohave’s shutdown, and would provide some justice for the tribe’s exploitation in the past.

A. Visiting Los Angeles

My first day on the job at the Trust I found out there was to be an important meeting with the city council the next day. That night, I drove to Phoenix, took an early morning flight to LA and attended the 9AM meeting. I continued to work with contacts in LA throughout the summer, and in midsummer LADWP announced a 20% RPS – more than we had hoped. They did not, however, include our tribal set-aside.

B. Other Funding Sources

I researched other funding sources for the renewable project, including USDA and DOE grants, Utility funding under Arizona’s RPS, even looking into selling Renewable Energy Credits (REC’s) to Nevada. I also investigated private funding and foundation dollars. The hurdles to overcome were huge: the project was marginally acceptable economically, required large amounts of capital (\$25 million dollars), and to top it off, doing business on the reservation is extremely difficult. I also realized that something of this scale would take several years of sustained effort: I had two months.

V. What I Actually Did

With my autonomy at the Trust, and the diminishing prospects for the power plant, I looked around to see what other initiatives I could work on. Through various contacts, I learned of a wind farm that was in the early stages of development just outside of Flagstaff.

A. Sunshine Wind Park

I met with the developers of the proposed wind farm early in my summer at the Trust. The wind farm was to be located just east of Flagstaff, in a Class 3 wind regime¹¹. The Trust was invested in the wind farm not just because it was a renewable project (and the first wind farm in Arizona), but because some of the land proposed for the farm was Hopi-owned. This was not tribal land per se (Trust land, or reservation) but a ranch that the Hopi had bought several years before.

The developers were interested in my help in convincing the tribal leaders that the project was a good idea financially for the tribe, and getting a respected third party to approve the project. I met with members of the tribal council and spent time educating them on wind energy and the wind development process. I was also privy to the details of the deals between the developers, Arizona Public Service (APS, the power purchaser) and the landowners. It was a unique opportunity to see wind development up close.

At the end of the summer, the tribal council approved the plan, and it looks like the wind farm will move forward. Permits were granted earlier this year and the park is scheduled for completion at the end of 2005¹². While the wind park would provide a fraction of the income of the coal royalties, it will still be a financial benefit to the Hopi tribe.

B. Hopi Renewable Education

While my work with the wind farm was interesting, I still wanted an opportunity to spend some time on the Hopi lands and meet some of these

¹¹ While the location is Class 3, the project is financially feasible because the wind is “peak coincident” – it blows mainly during summer afternoons. This is rare for wind, and on hot summer afternoons the demand from Phoenix is enormous.

¹² <http://www.sunshinewind.com/>

amazing people. The Trust has an intern, Anna Masayeva¹³, who does outreach to the Hopi tribal government. Anna and I developed a friendship, and together we crafted a renewable energy education program for the Hopi. The presentation covered small-scale solar electric and thermal, as well as both small-scale and utility scale wind energy. We took our show to several villages, where we would give a short presentation on renewable energy, as well as discuss local issues and answer questions. The size of modern wind turbines was the most thought-provoking aspect of the presentation for the Hopi; they were amazed by just how large they were. They were already familiar with solar panels, as many of the houses on Hopi lands are solar powered. It was these trips that led to my rooftop adventure.

C. Trust PV system

Rick Moore also asked for my help in adding to the Trust's photovoltaic system. The Trust has two pole-mounted arrays that provide a small amount¹⁴ of power to the building. A donor had recently given some money for the Trust to upgrade this system, and APS had just increased its solar rebate. I spent a lot of time working out the details of where and how to add more capacity to the system.

D. Southwest Renewable Energy Conference

The Trust is a co-sponsor of the Southwest Renewable Energy Conference, held in August each year. In 2004, it was held at Northern Arizona University in Flagstaff. I assisted with administration and running the conference, and was also able to attend sessions and meet with people from all over the region. The conference was excellent; large enough to get varied participants from government and industry, yet small enough to feel like you could actually meet people. I made some valuable contacts and learned much about various

¹³ Anna is Vernon Masayeva's niece. Vernon is a past tribal council chief, as well as the founder and executive director of the Black Mesa Trust, and environmental organization dedicated to preserving the water and ecosystem on Black Mesa.

¹⁴ 720 watts.

technologies and policies. I highly recommend attending one or two conferences like this one as a graduate student.

VI. Evaluation

I learned an enormous amount during my summer at the Trust. I met an incredible people; the Hopi, spent time in gorgeous Flagstaff, and was honored to work with a fantastic organization. I was at the table during the early stages of a large-scale wind project. And I attended my first renewable energy conference. I also learned things that should be given more than the scant paragraphs I leave here, but it will have to do for now.

A. Is Solar PV a Utility Scale Technology?

After spending nearly six months working over the economics of utility-scale photovoltaics, I feel strongly that the technology is inappropriate for this scale. Concentrating Solar Power (CSP, sometimes called solar thermal) seems far more appropriate for multi-megawatt installations. PV is too expensive, too intermittent, and simply not suited to large installations.

B. The Future of Clean Energy at the Trust

The Trust has to date not focused on renewable energy, and I feel strongly that renewables should play a larger part in the Trust's direction. Arizona's fledgling environmental movement could use the help of a "heavy-hitter" like the Trust to assist in procedural hearings and set leadership for renewables in the state. The Trust can also help with renewable policy on Navajo and Hopi lands, places where multiple coal plants are proposed. Thankfully, the Trust recently hired Roger Clark to direct the energy program¹⁵, and he plans on focusing more efforts on renewable policy.

¹⁵ Rick Moore is heading up the Kane Ranch project for the Trust.

C. An Intern's Journey

My summer at the Trust was excellent experience. While I had high hopes of building a huge solar park in the desert, I quickly came back to earth and ended up working on many exciting projects that I could actually accomplish in two short months. Though it may be a tired adage, initiative is really crucial as an intern. The purpose of an internship is not necessarily the specific project that you are hired for. The internship is about learning about an organization, and learning what it is like to work in such a place. I believe many environmental organizations are like the Trust: highly informal and reliant on individual initiative. My experience at the Trust was not just about wind development or Hopi economic development; it was about learning what the Trust is like. And I suppose the experience was also for the Trust to learn about me.

Cover photos courtesy of NREL (Solar Panels), National Park Service (White House at Canyon De Chelly), and Sunshine Wind.

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