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## Life beyond nuclear testing the Nevada Test Site

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**LIFE BEYOND NUCLEAR TESTING . . .**  
**THE NEVADA TEST SITE**

**by**

**Fina Martinez-Myers**

**A professional paper submitted in partial fulfillment  
of the requirements for the degree of**

**Master**

**in**

**Public Administration**

**Department of Public Administration  
University of Nevada, Las Vegas  
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## **ABSTRACT**

### **Life Beyond Nuclear Testing . . . The Nevada Test Site**

by

Fina Martinez-Myers

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Professor of Public Administration  
University of Nevada, Las Vegas

The Nevada Test Site (NTS) has served a crucial role in protecting the nation's security over the last 50 years. Changing national budgets and fiscal priorities have signaled dramatic adjustments for the NTS. Following the 1992 nuclear testing moratorium, the U.S. government has begun to make parts of the NTS available for private-sector use in an effort to generate money, utilize the Test Site's unique resources and capabilities, and provide economic development to southern Nevada. The initiative to attract private industry to the NTS is similar to activities taking place at other nuclear facilities across the nation. With a change in mission requirements, the question remained whether the NTS could effectively utilize its unique resources while continuing to maintain a state of nuclear testing readiness. Although Nevada's local leaders support private-sector development proposed for the NTS as a means to diversify the state's economy, the viability of commercialization of this site is an important concern. This qualitative study examines whether private-sector development is a viable alternative for the NTS.

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## **CHAPTER I**

### **INTRODUCTION**

Events of the past several years have had a profound impact on the nuclear testing mission of the U.S. Department of Energy (DOE). Growing concerns about safety and environmental problems caused various DOE-controlled weapons-producing facilities to be shut down in the 1980s. These shutdowns, at first expected to be temporary, became permanent when the Soviet Union was dissolved in 1991. With the end of the Cold War, the U.S. government has been deactivating and decommissioning its nuclear weapons complex. Production materials and facilities once considered vital to national defense have become excess. As many of these operating facilities are declared surplus and shut down, they are turned over for commercial and/or public reuse. Such is the case of the Nevada Test Site (NTS) whose mission has been redefined. The initiative to commercialize the NTS and expand its availability to private enterprise is similar to activities taking place at various nuclear facilities across the nation.

The NTS is a 1,350-square mile (860,000-acre) restricted area located in southern Nevada and operated by the U.S. Department of Energy, Nevada Operations Office (DOE/NV). This remote site is surrounded by thousands of additional acres of undisturbed, withdrawn land available for new projects. It is a multi-use, outdoor

laboratory that was the home of the nuclear weapons testing program for the United States and the United Kingdom (DOE/NV, 1998c).

Since the 1992 moratorium on nuclear testing, changes in nuclear testing policy have resulted in the pursuit of new activities proposed for siting at the NTS. The U.S. government has begun to transform parts of the NTS for commercial and public use in an effort to generate money and provide economic development to southern Nevada following the 1992 nuclear testing moratorium (State of Nevada Plan of Action, 1995). The current trend is economic diversification. The unique resources and capabilities of the NTS are now available to non-defense customers, such as other federal agencies and private industry, where there is a need of remoteness and security of operations. Test Site use has diversified into many programs such as hazardous chemical spill testing, emergency response training, conventional weapons testing, and waste management and environmental technology studies, among others [Online: <http://www.nv.doe.gov/>]. Additional innovative uses of the NTS are currently being studied.

### **Purpose of the Study**

The advent of the nuclear weapons testing moratorium in 1992 changed the scope of activities conducted at the NTS. Gerald W. Johnson, Manager of the DOE/NV, concurs: "As this transition brought with it a change in mission requirements, it also opened up many challenges and opportunities to use our capabilities and facilities in ways that were not previously considered" (DOE/NV, 1998a).

The purpose of this qualitative study is to examine whether private-sector development at the NTS is a viable alternative for this site's future use. Can private-sector

development at the NTS be pursued while sustaining a state of nuclear testing readiness? The question remains whether the Test Site can effectively utilize its resources while continuing to support stockpile stewardship of the nation's nuclear weapons.

In this study I will examine some of the potential private-sector initiatives proposed for siting at the NTS including aerospace activities, alternate and renewable energy sources, seismic technology testing, miners training, first-responder training and research, recertification of contaminated equipment/machinery, and diversified research opportunities.

Diversification of the Test Site's operations, to include private-sector development, is the key to its survival. Decades of nuclear weapons testing produced an infrastructure of highly trained people, unique facilities, and specialized equipment that need to be refocused on new missions (DOE/NV, 1998b). Efforts should be supported to expand Nevada's science and technology-based industry by retaining the Test Site's specialized work force. Promotion of such technologies would, in turn, diversify Nevada's gaming-based economy.

### **Significance of the Study**

Because of political pressures against testing of nuclear weapons and policy changes that have taken place over the last decade, the NTS community has become one of many areas throughout the United States that has been economically affected. According to the Nevada Test Site Economic Adjustment Task Force which was created in 1994 by Governor Bob Miller to develop a unified plan of action dealing with the future



of the NTS and its work force, the NTS was said to account for approximately one third of all defense employment in Nevada.

“For more than 40 years, the nation’s investment in people, property, and technology at the NTS has been reserved for federal use. Now, these resources have become available for commercial and public use” [Online: <http://www.nv.doe.gov/>]. The Test Site’s capabilities and infrastructure should be utilized by both federal agencies and the private industry. Taxpayers should expect their investment in this site to be utilized to its fullest capacity.

The federal government, the state of Nevada, and the private sector are faced with the challenge of attracting and supporting high technological programs and industry to the NTS, while also sustaining support for the reduced nuclear weapons defense program. New private-sector initiatives are needed to maintain the NTS as a national resource.

The attraction of private-sector industry to the NTS affects a multitude of stakeholders, many which have a stake in winning back the test site’s historical economic prominence in Nevada:

- The DOE/NV which provides management and oversight for all activities conducted at the NTS;
- The national laboratories which assist with ensuring the integrity of the nation’s nuclear weapons stockpile;
- Bechtel Nevada which manages the site’s operational activities and provides diagnostics for experimental work performed at the NTS;

- The Defense Special Weapons Agency which conducts conventional weapons effects experiments;
- Wackenhut Services, Inc., which performs security-related services at the NTS;
- IT Corporation which performs environmental assessment and characterization activities at the NTS;
- The NTS Development Corporation which is tasked with attracting new business to the NTS;
- The Corporation for Solar Technology and Renewable Resources which promotes alternate and renewable energy sources;
- The Nevada Alliance for Defense, Energy, and Business which interacts with community leadership to maximize the assets of the NTS;
- Native American Tribes which endure continued reduced access to culturally significant areas; and
- The Southern Nevada community which is impacted by the socioeconomic conditions resulting from this site's activities.

Diversification of the Test Site was identified as a key to success in the early years of the moratorium. The State of Nevada Plan of Action for the Future of the Nevada Test Site and its Workforce (1995) states, "Diversification of the NTS can make significant and long-term contributions to local and national environmental, economic, defense, and energy-related needs." The attraction of new businesses would absorb many of the highly qualified employees at the NTS and it would keep those individuals in Nevada as

employed and contributing citizens (Nevada Business Journal, 1997). Local leaders support alternative private initiatives proposed for the NTS as a means to diversify the state's economy.

### **Delimitations**

As an employee for Bechtel Nevada (DOE's prime management and operations contractor at the NTS), I initiated this study under the erroneous assumption that information relevant to this subject would be readily available; however, that was certainly not the case. Written documentation has been difficult to locate and accessibility to certain materials has been, at times, limited.

Although numerous commissions have been tasked to study alternative uses of the NTS, most of their findings have gone undocumented over time. In addition, I have encountered difficulties in scheduling interviews with some of the aforementioned stakeholders in an effort to acquire primary reference material. It has been extremely burdensome and time consuming to rely on other individuals for information. These factors, combined with the typical time constraints often posed on graduate students, have led to quite a challenging undertaking when formulating this study.

### **Organization of the Study**

Chapter 1 of this study introduces the purpose of this study and poses the hypothetical question of whether the development of private industry is a viable alternative for the NTS which is undergoing a major transition in its mission and organizational culture.

Chapter 2 features a review of the related literature. Both primary and secondary references are cited as supporting evidence for public-sector development at the NTS. By examining the history of the NTS and the evolution of its national policy concerning nuclear weapons testing, Chapter 2 sets the framework for this study. This is followed by a description of the NTS and its valuable infrastructure. In addition, the site's attributes, limitations, and deficiencies are highlighted. This chapter also examines various projects proposed for siting at this installation and the viability of their development and potential operation at the NTS. Examples of revitalization initiatives adopted at other nuclear weapons facilities across the nation are additionally provided in Appendix II as further supporting evidence in favor of introducing public-sector development at the NTS.

Chapter 3 explains the methods used for collecting the data included in this study. An extensive research effort on this topic was conducted to include DOE and Bechtel Nevada documentation, publications, journals, periodicals, Internet databases, World Wide Web search engines, promotional materials, etc. Additionally, interviews were conducted and telephone communications were initiated with representatives from various proposed projects.

Chapter 4 discusses various private-sector initiatives presently being examined for siting at the NTS. This chapter also introduces the reader to the Test Site's first private-sector tenant. The information presented here was compiled from various interviews as well as an extensive review of the current literature on this subject.

This study concludes with a summary of how the changes in mission requirements at the NTS have led to new challenges and opportunities for the effective utilization of its

capabilities, infrastructure, and skilled work force. Chapter 5 suggests that additional studies be conducted to examine the progress made concerning private-sector development at the NTS.

## **CHAPTER 2**

### **LITERATURE REVIEW**

Global developments that have taken place over the last decade have created a need to re-examine the need for nuclear weapons testing and its level of implementation. Pursuant to such developments and in consideration of the U.S. moratorium, the NTS is currently in transition from its primary mission of nuclear weapons testing to activities that support the science-based stockpile stewardship mission as well as various other missions. As will be shown throughout this chapter, this transition has provided opportunities to use the existing NTS capabilities for future expansion while also providing a base for future enhancements in technologies that can benefit the NTS and the southern Nevada community.

The U.S. government has been tasked with utilizing this immense resource to the best extent possible while maintaining a state of readiness in case testing was to resume. The DOE/NV attempts to maximize the utilization of the NTS in hopes of subsidizing the cost of sustaining the existing infrastructure and retaining the skilled work force. Consequently, the DOE has requested that numerous studies be conducted to evaluate the concept of multiple usage of the NTS. In this light, there has been considerable literature written on the potential uses of the NTS since the 1992 moratorium. The results of this extensive research will be addressed in this and subsequent chapters. Most of the literature

I found favors the introduction of private industry at the NTS. To date, a thorough search of this topic indicates that the opponents' views on this issue have not been well documented.

To give the reader of this study some perspective, Chapter 2 includes a brief overview of the national policy on nuclear weapons testing and the significant role that the NTS has played from its inception to the present time. (For those readers not familiar with the history of the NTS, Appendix I provides an historical perspective of the Test Site.) Following is a discussion of the budgetary constraints experienced since the end of the Cold War which led to the creation of the DOE's Office of Worker and Community Transition and the subsequent introduction of community reuse organizations (CROs) nationwide. The role played by Nevada's CRO, namely, the NTS Development Corporation, is next. Additionally, this chapter addresses Bechtel Nevada's efforts as the prime management and operations contractor at the NTS and its business development strategies for expanding the Test Site's mission. Chapter 2 concludes with an examination of the attributes, limitations, and challenges that the NTS offers to new business ventures.

### **Evolution of National Policy**

Since its inception in 1950, the NTS has undergone numerous changes in the nation's policy on nuclear testing. Over the last decade, the NTS has experienced significant changes due to the evolution of national policy as depicted in Figure 1. On October 2, 1992, President George Bush signed a nine-month moratorium on underground nuclear weapons testing (Bechtel Nevada [BN], 1998b). One year later, on July 3, 1993, President Clinton extended the test ban until October 1994, stating that the

**Figure 1. The Evolution of National Policy**

<b>EVOLUTION OF NATIONAL POLICY</b>	
<i><b>Date</b></i>	<i><b>Event/Policy Change</b></i>
September 1991	The President made the first of three announcements on significant reductions in the nuclear weapons stockpile.
September 1992	The last underground nuclear test was performed at the NTS.
October 1992	The President signed a 9-month moratorium, stopping all nuclear testing until July 1993.
July 1993	The President announced an extension of the moratorium and directed the Department of Energy to develop alternative means for a stockpile stewardship program.
November 1993	Congress, through the National Defense Authorization Act (Public Law 103-160) instructed the Secretary of Energy to "establish a stewardship program to ensure the preservation of the core intellectual and technical competencies of the United States in nuclear weapons."
May 1995	The Nonproliferation Treaty was extended indefinitely.
August 1995	The President announced the decision to seek a zero-yield Comprehensive Test Ban Treaty and established the conduct of a science-based stockpile stewardship program as a condition of the United States' entry into the treaty. Maintenance of a safe and reliable stockpile is considered "a supreme national interest of the United States."
<b>Source: <u>Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in Nevada, Chapters 1-9, August 1996</u></b>	



U.S. would not resume testing “as long as no other nation tests” (Scammell, 1993). Even with these significant changes, Congress passed the National Defense Authorization Act for Fiscal Year (FY) 1994 (Public Law 103-160) which directed the DOE to maintain a high level of confidence in the safety, reliability, and performance of the nuclear weapons stockpile, and to maintain the ability to design, develop, manufacture, and test nuclear weapons (DOE/NV, 1996b). This action goes to show the important role played by the NTS throughout its history. The NTS has been the nation’s most widely used location for nuclear weapons testing to meet the national defense mission.

Concurrent with the advent of the 1992 moratorium, on April 14, 1992, the NTS was designated as a DOE National Environmental Research Park where scientists and students could conduct environmental research. The DOE signed a Memoranda of Understanding with both of the major universities in Nevada and the Community College of Southern Nevada to provide further opportunities to researchers to study the compatibility of the environment with various energy technologies (DOE/NV, 1998a).

Under the moratorium, President Clinton directed the DOE to maintain the capability to conduct nuclear tests. “On August 11, 1995, President Clinton reaffirmed this commitment and announced his intention to seek a zero-yield Comprehensive Test Ban Treaty” (DOE/NV, 1996b). A zero-yield Comprehensive Test Ban Treaty would ban any further nuclear weapon test explosions. President Clinton has extended the moratorium on three occasions as outlined in Figure 1. In addition, in September 1996, President Clinton signed the Comprehensive Test Ban Treaty (CTBT) on behalf of the United States (DOE/NV, 1998h). “The underground nuclear testing moratorium has resulted in the need

for the DOE to redefine mission priorities and manage land use at the NTS to support current and future activities mandated by statute, Presidential direction, and Congressional authorization and appropriation” (DOE/NV, 1996b). The transition of the NTS from an active underground nuclear weapons development and testing program to a program of stewardship of the enduring nuclear stockpile has provided the opportunity to make selected parts of the NTS available to various alternate uses, examples of which are discussed in Chapter 4 of this study. With the end of large-scale nuclear testing, the DOE has embarked on a campaign to market the resources of the NTS to new customers in the private sector. Reportedly, only 110 square miles of the Test Site has been impacted (7.88 percent) by the nuclear weapons testing program, and only 4.6 square miles are contaminated with gamma radiation (DOE/NV, 1996b). This leaves an enormous span of land (approximately 1,200 square miles) available for hazardous chemical testing, environmental remediation development, continued defense-related support, and a variety of new potential ventures.

In August 1997, ex-Energy Secretary, Federico Peña, signed an economic development use permit allowing the DOE/NV CRO — the NTS Development Corporation — to use designated areas of the Test Site for commercial development to help lessen the effects of the DOE defense activities downsizing. Upon signing this document, Peña stated, “. . . the Test Site will be open for the first time to commercial use. The Test Site has unique properties and capabilities that make it an extremely attractive option for high-tech companies” (Kistler Aerospace, 1997a). This significant event expanded the historical role of the NTS by permitting private entities to use portions

of the NTS over the next 10 years. Notwithstanding the goal of this initiative to attract new work at the NTS, Secretary Peña stressed that “national security remains the primary mission of the Nevada Test Site” (DOE/NV, 1998a).

Accordingly, the DOE/NV policy, as stated by Manager Gerry W. Johnson is “to provide for the broadest range of utilization consistent with the national security mission of the NTS” (DOE/NV, 1998b). The DOE continues to follow its initial instructions to maintain the nuclear testing program in a state of readiness, which may require response within a time frame of two to five years. It is committed to continuing the management of the NTS in a manner that meets evolving missions and responds to the concerns of affected and interested individuals and agencies. This new attitude can be observed in Mr. Johnson’s statement: “As this transition brought with it a change in mission requirements, it also opened up many challenges and opportunities to use our capabilities and facilities in ways that were not previously considered” (DOE/NV, 1998b).

Changing the focus of the DOE’s efforts from the production of nuclear weapons to new missions required that the management and organizational cultures shift towards a project-oriented approach in which stakeholders would be more involved. “After a 50-year operating history, the effort required to make these changes is significant” (DOE Office of Environmental Management, 1998).

### **Budgetary Constraints**

“During the Cold War era, there existed a relatively unconstrained availability of resources . . . . The abrupt end of the Cold War in the late 1980s also brought an end to the availability of relatively unbounded resources” (DOE Office of Environmental

Management, 1998). Federal budget outlays for national defense and for nuclear weapons were cut substantially over the last decade. The NTS community has been one of the many areas throughout the country economically affected by the prevalent political pressures against testing of nuclear weapons.

Notwithstanding these budgetary constraints, Secretary of Energy Bill Richardson recently submitted the FY 2000 budget which included a "modest increase in funds for activities of the Nevada Operations Office (BN, 1999c). Under this request, which is subject to Congressional approval, DOE/NV funding would rise \$2.4 million in FY 2000 to a total of \$659.4 million (see Figure 2). The budget includes funding for two subcritical experiments in the fiscal year, assuring a continuing role for DOE/NV and the NTS in stockpile stewardship.

As shown in Figure 2, the FY 2000 defense programs budget would actually decline very slightly, to \$245.3 million, from the planned current-year expenditures of \$247.5 million under the request. Environmental management dollars would rise from \$89.6 million this year to \$93.1 million in the coming year. The largest change is in work for others (reimbursable work). Planned expenditures in the current year are \$31.2 million, but would rise to \$47.5 million in the coming year, an increase of more than 52 percent. "During his budget press conference, Secretary Richardson stated that the Department will look to other agencies' programs and efforts such as space launches at the NTS 'to keep it vibrant'" (BN, 1999c). As can be observed in Figure 2, DOE's budget continues to display a steady increase of support for Nevada's operations. "We are

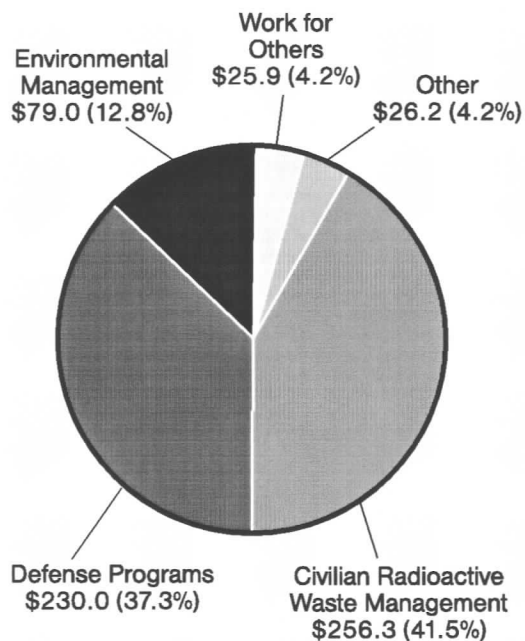
Figure 2. Department of Energy, Nevada Operations Office Total Funding for FY 1998, FY 1999, and FY 2000

## TOTAL FUNDING BY PROGRAM

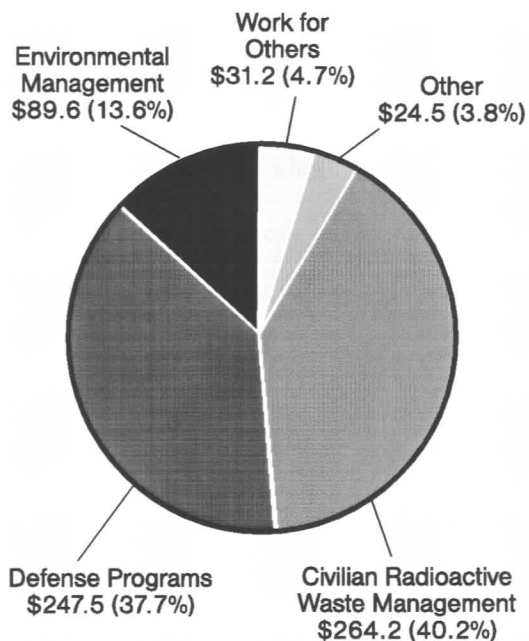


Nevada Operations Office

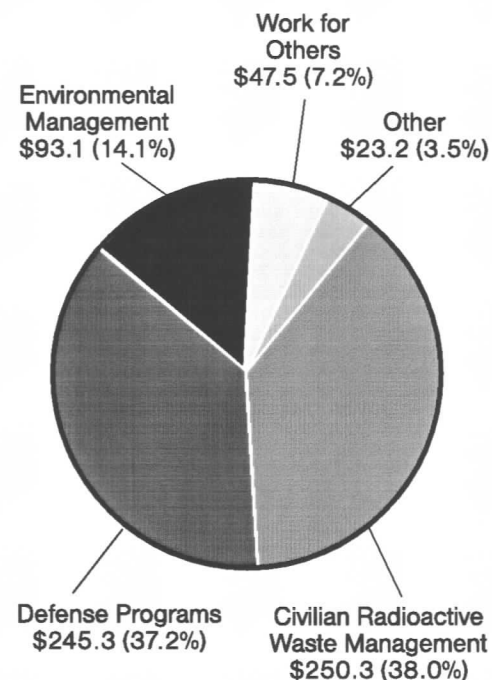
### FY98 \$617.4M



### FY99 \$657.0M



### FY00 \$659.4M



Source: DOE/NV Resources Management Division (Online: <http://www.nvhome/rmd/>)

very fortunate,” said David Marks, DOE/NV chief financial officer. “The Nevada Test Site budget is going to be stable” (BN, 1999c).

According to the DOE/NV 1998 Performance Evaluation Plan for Bechtel Nevada, DOE’s funding for the NTS for FY 1998 was also described as stable. This sense of stability is a useful indicator of the support that the DOE lends to the NTS operation.

The budgetary decreases experienced over the last decade have resulted in a significant downsizing of the NTS work force. Employment levels among the contractor work force are known to have decreased by 45 percent from approximately 5,500 employees in 1993 to some 2,500 employees at the end of 1998 [Online://bnhome/SDdiv/BDProc1.htm].

The NTS experienced one of the highest decreases in the nation in regards to downsizing. At present, the Test Site’s prime contractor--Bechtel Nevada--employs 2,331 employees (T. M. Hayes, personal communication, February 23, 1999). A \$5-million grant has been allotted to Nevada’s CRO to ease the impacts of downsizing at the NTS and hopefully create new job opportunities. “This important investment will build on the strengths of the Test Site to secure high-skill, high-paying jobs in Southern Nevada,” said Secretary of Energy Federico Peña. “In addition, the funds will allow creative uses of the Department’s facilities and employees affected by downsizing in ways that create new job opportunities and diversifies the economic growth of the region” [Online: <http://transitions.org/>].

### **Worker and Community Transition**

The Office of Worker and Community Transition was formed from Defense Program-funded activities in September 1994 “to assure the fair treatment of workers and communities affected by changing Department of Energy missions . . . in accordance with Section 3161 of the Defense Authorization Act of 1993” [Online: <http://www.wct.doe.gov/>].

This transition program mitigates the impacts on workers and communities from contractor work force restructuring and assists in community planning. As stated in its this Office's Web site, "The Worker Transition program provides assistance to any employee of the Department of Energy employed at a Department of Energy defense nuclear facility, including any employee of a contractor or subcontractor of the Department of Energy employed at such a facility that is being restructured" [Online: <http://www.wct.doe.gov/>].

This Office ensures that preference is given to displaced workers for new hiring by the DOE. The program develops initiatives to limit involuntary layoffs and promote voluntary separation incentives by way of severance pay, retraining assistance, outplacement assistance, relocation assistance, and extension of medical benefits. Transition program activities were reportedly the highest in FY 1994 and FY 1995. At present, transition activities are being phased down due to the decrease in employee layoffs, with program termination scheduled for FY 2000 (DOE Office of Worker and Community Transition, 1998). Community assistance programs are expected to create or retain 5,000 additional jobs in FY 2000 [Online: <http://www.wct.doe.gov/>]. Figure 3 provides a detailed account of the funding the DOE has allocated to the various sites nationwide.

On March 20, 1998, the Office of Worker and Community Transition under Section 3161 of the Defense Authorization Act of 1992 (Public Law 102-284) awarded the NTS Development Corporation \$5 million in community transition funding to provide Nevada with economic adjustment assistance.



Figure 3. Community Transition Funding and Accomplishments

## Community Transition Funding and Accomplishments

..... Office of Worker and Community Transition

Fiscal Years 1993-1998

Site	Total DOE Funds Committed	Funds Spent	Jobs Created or Retained (Reported)	Cost Per Job Created	Jobs Created or Retained By 2001 (Est.)
Fernald	\$411,921	\$124,886	0	\$0	300
Idaho	\$20,325,000	\$12,052,352	1,808	\$6,666	3,099
Los Alamos	\$10,665,160	\$3,181,783	331	\$9,613	1,728
Mound	\$14,700,000	\$8,043,381	283	\$28,422	833
Nevada	\$12,520,000	\$7,825,324	1,666	\$4,697	2,698
Oak Ridge	\$48,752,000	\$36,483,944	3,183	\$11,462	5,580
Paducah	\$400,000	\$21,769	0	\$0	0
Pinellas	\$17,754,700	\$13,754,200	1,838	\$7,483	2,331
Portsmouth	\$5,000,000	\$939,026	227	\$4,137	804
Richland	\$18,689,382	\$13,192,761	1,446	\$9,124	3,464
Rocky Flats	\$31,735,624	\$30,610,783	1,789	\$17,111	3,320
Savannah River	\$47,622,625	\$25,854,566	3,451	\$6,742	8,981
<b>Totals</b>	<b>\$228,164,491</b>	<b>\$151,959,889</b>	<b>16,022</b>	<b>\$9,484</b>	<b>33,138</b>

Source: Planning Guidance for Contractor Work Force Restructuring, December 1998.



This community transition grant was determined to be used in five primary areas:

- (1) a planning and development program that will identify projects or programs that will have a high potential for job creation in southern Nevada;
- (2) a corporation relations program that will support new and emerging businesses;
- (3) a capital finance program that will loan money to firms which create high-value, long-term private-sector jobs and expand and diversify the local economy;
- (4) an asset management program that will use the Nevada Test Site for the transfer of real, personal, and intellectual property for economic development purposes; and
- (5) an administrative/operating fund that will provide management functions to effectively utilize resources and support the development of new and expanded businesses [Online: <http://www.wct.doe.gov/>].

#### **NTS Development Corporation's Role**

A number of CROs have been created nationwide to assist the DOE in the post-Cold War era with the downsizing that has taken place due to the discontinuance of its weapons mission. Appendix II provides examples of DOE's diversification initiatives taking place at four former U.S. nuclear weapons sites. The NTS Development Corporation is Nevada's non-profit CRO funded by a DOE grant from the Office of Worker and Community Transition. The NTS Development Corporation grant, \$20 million over a four-year period, was awarded to lessen the effects of downsizing on local communities (NTS Development Corporation [NTSDC], 1997a). The mission of the NTS Development Corporation is "to facilitate the development of sustainable commercial activities in science and technology which maximize utilization of DOE resources, support

on-going DOE missions, expand non-government opportunities, and add long-term value to the regional economy” [Online: <http://www.nv.doe.gov/about/devcorp.htm>]. The first year’s \$5 million grant was used to fund a business development and marketing program to promote opportunities for commercial enterprises at the Test Site. It also created a business assistance program designed to help technological start-up operations, and will offered a capital finance program (BN, 1998d).

Although similar to other CROs in regards to its ultimate goal, the NTS Development Corporation is unique. Janice Wiedemann, Vice President of the NTS Development Corporation (personal communication, February 26, 1999), sees it as a “model organization” in that it is involved in pursuing new missions at a site which is still engaged in the ongoing mission of subcritical testing.

The NTS Development Corporation had its origins in March 1993 when Governor Bob Miller appointed an economic adjustment task force to study the future of the NTS which was experiencing the loss of thousands of jobs due to the moratorium on nuclear tests and federal budget cuts (State of Nevada Plan of Action, 1995). This task force, upon request from the DOE/NV and Governor Miller, was later transitioned in 1995 into the NTS Development Corporation, comprised of community leaders from both private and public sectors of the economy. Officially incorporated in mid 1995, the Corporation’s major milestones and accomplishments are shown in Appendix III of this study.

The NTS Development Corporation operates under the direction of a 10-member Executive Committee and an influential 60-member Board of Directors comprised of key decision makers from the business, finance, labor, academia, and government sectors

[Online: <http://www.nv.doe.gov/about/devcorp.htm>]. The Board's variety of business and civic leaders "reflect the state's vital interest in shaping new ventures and a new mission at the Test Site" (BN, 1998h). "The Board functions as the community's 'single voice' for economic development initiatives involving the Nevada Test Site" (NTSDC, 1997a). In an interview held with Vice President Janice Wiedemann (personal communication, February 26, 1999), she commented that its Board of Directors is one of the Corporation's most valuable assets. The NTS Development Corporation attempts to involve representatives from throughout the community, Ms. Wiedemann went on to say, in order to enhance the Corporation's chance for success. The NTS Development Corporation is "proud of its professional staff who possess vast experience in economic development, commercialization, diversification, legislation, conference planning and production, and finance" [Online: <http://www.nv.doe.gov/about/devcorp.htm>].

As the DOE-designated CRO for the Test Site, the NTS Development Corporation promotes increased economic activity at the NTS in order to benefit both the public and private sectors. In a letter dated April 24, 1996, addressed to the DOE/NV Environmental Management Division Director, Donald R. Elle, Tim Carlson, President of the NTS Development Corporation, stated:

To achieve this, the non-profit, community-based organization is working closely with the DOE and its management and operations contractor to create opportunities for commercial development at the site. The goal is twofold: (1) to protect the long-term interests of the community by enhancing future options for

the work force, and (2) to maximize utilization of government resources and facilities which have been affected by budget restrictions.

The Corporation's promotional brochure best describes its philosophy: "For 50 years the country's investment in people, property, and technology at the Nevada Test Site has been reserved for federal use. Now these valuable resources are becoming available for commercial use. Portions of the Nevada Test Site are Open for Business. Possibly your business" (NTSDC, 1998j).

"The NTS Development Corporation has entered into strategic partnerships with the business, education, and scientific communities that can access facilities, equipment, and resources that were once unattainable, thereby creating exciting new opportunities for the business community" [Online: <http://www.ntsdev.com/>].

"This is a site with characteristics that don't exist anywhere else," said president Tim Carlson. The Corporation works with the DOE/NV and Bechtel Nevada to promote and encourage the growth of science and technology in Nevada. Additionally, the NTS Development Corporation maintains strategic alliances with the national laboratories to promote the commercialization of new and emerging technologies. This non-profit organization markets the Test Site's assets to public and private enterprises; facilitates commercial development at the site; and maximizes the use of the Test Site's personnel, skills, technologies, and facilities (NTSDC, 1997a; NTSDC, 1998a).

J. Wiedemann also stated that the NTS Development Corporation works closely with the Nevada legislation to maintain essential communications with the federal agencies it deals with in Washington. "By way of our supportive relationships with the

Congressional delegates, the NTS Development Corporation has been able to make significant progress in its marketing endeavors,” added Wiedemann (personal communication, February 26, 1999).

U.S. Senator Harry Reid is one of the Corporation’s primary sponsors. Senator Reid is the ranking member of the Senate Energy and Water Appropriations Committee which oversees the funding for the DOE. Senator Reid reminisces, “When I was growing up, the best jobs in the state were at the Nevada Test Site. My goal is to make the Nevada Test Site and Southern Nevada once again one of the nation’s premier centers for science and technology” (NTSDC, 1998a). At the Global Energy Futures Exchange (GlobeEx) conference held in Las Vegas in October 1998, Senator Reid offered high words of praise for the role played by the NTS Development Corporation:

From the very beginning, I felt comfortable supporting the NTS Development Corporation because I knew the organization had secured the right mix in its Board of Directors to make things happen at the Nevada Test Site. The results, however, have far exceeded my greatest expectations. During its brief existence, the NTS Development Corporation has done much to promote the growth of science and technology in Nevada . . . . I encourage this organization to continue its momentum in forging the new frontier for Nevada. Board members are to be commended for their enthusiasm and dedication in helping the NTS Development Corporation to fulfill its mission (NTSDC, 1998g).

The NTS Development Corporation is currently targeting various industries to be located at the NTS to include alternative energy, environmental, chemical, and aerospace

companies (see Chapter 4). In the October 1998 issue of its newsletter, *The Globe*, Carlson, summarizes the future of the NTS, "We are no longer just a place where bombs were tested. We are now known as a premier location for development and testing of new technologies that can revolutionize the future of aerospace technologies and energy efficiency" (NTSDC, 1998f). "No matter how momentous its history, it is our belief that the story of the Nevada Test Site is just beginning," stated Carlson (NTSDC, 1998a).

### **Bechtel Nevada's Role**

As the DOE/NV's prime contractor for the NTS and in partnership with the NTS Development Corporation, Bechtel Nevada also plays an important role in attracting new missions to the Test Site. Its business development efforts are centralized within the Office of Strategic Development and Communications (SD&C). "The mission of SD&C is to assist the DOE/NV in identifying new markets, obtaining new work, establishing partnerships, managing resources, promoting environmental planning, performing technology assessments, implementing technology transfer, and promoting economic development [Online: <http://bnhome/SDdiv/BDProc1.htm>].

In an interview held with an SD&C representative, Elaine Mew (personal communication, February 10, 1998) explained that successful business development requires in-depth knowledge of the targeted customers and their goals and needs. Part of Bechtel Nevada's strategy in attracting new work to the NTS consists of keeping abreast of the customer's organizational changes, budgets, and news releases in order to determine their real needs and outstanding issues. "Close examination and analysis of new

opportunities will help us all to focus our efforts primarily on only those opportunities that meet the strategic business objectives of one of more of our NTS business lines.”

In order to maximize the effectiveness of their limited business development resources, the SD&C has established certain selection criteria utilized to target potential NTS customers. Typical candidates include “U.S. government agencies, major industrial firms, and technology development companies; organizations or industries addressing a significant national goal; organizations or industries committed to activity in our areas of expertise . . . such as sensor equipment groups or mining and tunneling firms; and organizations or industries with programs . . . that the parent organization will continue to invest in, e.g., seismic testing, drilling technology, etc.” [Online: <http://bnhome/SDdiv/BDProc1.htm>]. All prospects are reviewed by a Screening Committee comprised of Bechtel Nevada’s General Manager, the Deputy General Managers, Mission Managers (Assistant General Managers), and the DOE/NV’s Strategic Initiatives Coordinator. This Screening Committee discusses whether each individual prospect meets the overall NTS objectives and determines if the requested business development budget amount is appropriate in relation to the expected economic benefit.

Each proposed project must also be reviewed by a Site Use and Development Board, as outlined in the Nevada Test Site Resource Management Plan (1998), to determine if it is appropriate for NTS facilities as well as to receive approval to use a proposed project location. The Site Use and Development Board is comprised of representatives from the DOE/NV, its Management and Operating contractors, the

national laboratories, the Nellis Air Force Base, the NTS Development Corporation, and the Defense Special Weapons Agency (DOE/NV, 1998a).

Bechtel Nevada utilizes the following four DOE-mandated measures to evaluate the viability of all business opportunities proposed for the NTS:

(1) Does the new work opportunity attract, exercise, compliment, and enhance our core competencies? (2) Does the new work opportunity generate increases in income with proportionately less increases in cost? (3) Is the new work opportunity compatible with the current, planned, and future projects and uses at the NTS? and (4) Will the new work opportunity garner support from the larger southern Nevada community? (Richardson, 1996).

#### **Attributes, Limitations, and Challenges of the Nevada Test Site**

As a result of the changing mission priorities, the DOE has been tasked with providing a comprehensive planning effort for the Test Site. The overall goal of such comprehensive planning is to ensure that the NTS can provide the necessary resources for existing and future missions. An integral part of this effort is the examination of the Test Site's scientific, technical, industrial, and administrative resources and capabilities and its existing infrastructure and capital equipment. Over the years, the U.S. government has invested heavily in the infrastructure of this site—its capital assets include more than 1,100 buildings valued at approximately \$700 million (DOE/NV, 1998b).

Section 3153 of the Fiscal Year 1995 National Defense Authorization Act directed the Secretary of Energy to submit a report to Congress on the feasibility of conducting



various defense-related activities other than nuclear testing at the NTS. Both the House of Representatives and the Senate passed provisions calling for such a study (DOE/NV, 1995).

In view of the DOE's quest in redefining the role of the Test Site, the aforementioned study has been followed by numerous other studies, reports, plans, newspaper/journal articles, press releases, bulletins, directives, regulatory documents, environmental impact statements, correspondence, booklets, and promotional materials that highlight the Test Site's attributes, limitations, and challenges. Following is a summary of the site's unique characteristics compiled from a variety of sources.

#### Attributes

The special features that made the Test Site suitable for its original nuclear weapons mission remain its best selling factors. Listed below are a few of the important attributes of the NTS that make it a unique national asset:

- More than 1,350 square miles of restricted-access land, plus an additional buffer zone provided by the Nellis Range and Tonopah Test Range (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h; State of Nevada Plan of Action, 1995).
- Highly protected area (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h; State of Nevada Plan of Action, 1995). The NTS is a posted, controlled-access facility protected by gates, mobile patrols, and highly trained emergency response teams. Sensitive areas within the NTS are further protected by fencing, facility alarms, closed-circuit television, and perimeter intruder detection and alarm systems. Given the

constant monitoring, the Test Site is probably one of the safest places in the United States where to conduct business.

- Remote yet accessible. Fewer than 20,000 people live within a 50-mile radius of the NTS (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h; State of Nevada Plan of Action, 1995). Population growth projections in this area indicate little likelihood of future urban encroachment.
- An existing airport that could be upgraded to accommodate large transport aircraft (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h; State of Nevada Plan of Action, 1995). The site is adjacent to the Nellis Air Force range complex, thus benefitting from ready access to the on-site Desert Rock Airport.
- Extensive existing roadway, water distribution, electrical power, and communications systems (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h).
- Existing wastewater systems adequate to serve all current facilities (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h).
- A suitable and well characterized geology and hydrology base (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h). The Nevada Test Site Alternate Use Feasibility Study (1995) states that the NTS is perhaps the most extensively characterized site anywhere in the world. "As the result of more than 1,000 [sic] nuclear weapon tests and the associated drilling and tunneling activities, virtually every geologic formation or environmental parameter at the NTS has been documented." Moreover, the need to clean up and safely dispose of low-level radioactive and mixed waste has led to a

management program that actively seeks to develop new environmental restoration and waste management technologies (DOE/NV, 1996a).

- An extensive scientific, technical, and industrial skill base (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h; State of Nevada Plan of Action, 1995). The Test Site's skilled work force is comprised of scientific, technical, and engineering professionals; qualified technicians; and skilled craftsmen.
- Convenient support services (DOE/NV, 1995; DOE/NV, 1998h; State of Nevada Plan of Action, 1995). Located within the boundaries of the NTS, the base camp of Mercury has many of the amenities found in a typical small town: housing, medical services, fire protection, law enforcement, security, a large fleet of vehicles and repair facilities, and a cafeteria.
- Many existing buildings and structures of various types (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h; State of Nevada Plan of Action, 1995).
- Nevada's pro-business climate (i.e., less government intervention) (DOE/NV, 1995; State of Nevada Plan of Action, 1995). "Nevada's easy access to public officials and minimal regulatory intervention combined with the state's low taxes, tax abatement and deferral programs, no corporate or personal income taxes, and low interest financing from the state's Industrial Development Bonds are some of the advantages of doing business in Nevada." Furthermore, it is reported that Las Vegas is one of the four metropolitan areas projected to have the fastest economic growth by the year 2005 [Online: <http://www.state.nv.us/businessop/index.htm>].

- Exempt from certain environmental restrictions (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h). The Test Site provides researchers with an outdoor laboratory for conducting real-life, full-scale tests often too dangerous to undertake elsewhere.
- Attraction of “outcast” industries. “We’re able to be the good guys for once,” said Tim Cooper, a DOE civil engineer. “We take these companies out of someone’s backyard and put them here” (Simon, 1998).

### Limitations

Some limitations to performing new activities at the NTS were noted in the literature I reviewed. Although none of these limitations are seen to be particularly troubling, they would need to be addressed as new activities are located at the Test Site.

Some of the limitations include:

- The need to obtain permits before drilling new wells or performing construction operations or other activities that would disturb previously untouched land (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h).
- Higher-than-average costs for labor, materials, and supplies because of its location and remoteness (DOE/NV, 1995; DOE/NV, 1998h).
- The need to conserve water, a treasured resource, when conducting business in a desert environment (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h).
- The requirement to remain responsive to federal policies and priorities, fiscal and legal constraints, and public support and state interests for economic diversification (DOE/NV, 1995; DOE/NV, 1996b; DOE/NV, 1998h; State of Nevada Plan of Action, 1995).

- Unavoidable adverse impacts to portions of the land, geologic, and groundwater due to underground testing, making them unusable for most purposes (DOE/NV 1996b; DOE/NV, 1998h).
- Existence of subsidence craters caused by past nuclear testing (DOE/NV, 1996b; DOE/NV, 1998h).

### Challenges

In addition, certain challenges, or disadvantages, associated with the NTS have been identified. Although these challenges do not make the NTS an unacceptable location, they do need to be considered when bringing in new work. Challenges may include the following:

- Many of the NTS roadways may need repair (DOE/NV, 1995; DOE/NV, 1998h).
- Many existing facilities, buildings, and structures are nearing the end of their useful lives and might have to be replaced, depending upon the alternate use (DOE/NV, 1995; DOE/NV, 1998h).
- The remoteness of the NTS requires considerable commuting time and may make it difficult to attract administrative personnel (DOE/NV, 1995b; DOE/NV, 1998f; State of Nevada Plan of Action, 1995).
- Rent is high (DOE/NV, 1995). Rent averages \$8.06 per square foot per month, according to Gary McDaniel and Kevin Breen, Bechtel Nevada's Facilities Management (G. McDaniel and K. Breen, personal communication, March 1, 1999). Some believe that this amount is too steep for real estate located at the NTS.

- The overriding mission to maintain a state of readiness if testing were to resume (DOE/NV, 1995; DOE/NV, 1998h; State of Nevada Plan of Action, 1995).

“Privatization would have to proceed with caution, because the government still has first dibs on the rugged, mountain-fringed site” (Simon, 1998). “Not just any company will get to use the NTS. Their operations could not in any way interfere with regular DOE operations and would have to be complementary with Nellis Air Force activities,” DOE spokeswoman Roxanne Dey said (Manning, 1997).

- The national laboratories view private-sector industry with suspicion (E. Mew, personal communication, February 10, 1999). The national laboratories tend to have a proprietary attitude toward the Test Site and do not readily welcome newcomers.
- Minor disturbance of the land and wildlife (DOE/NV, 1996b; DOE/NV, 1998h). Such disturbance might be caused by the possible construction of gas lines, pipe lines, and/or power lines. Additionally, increased traffic and construction activities could result in desert tortoise mortalities.

“Additionally, not every company wants to be associated with a nuclear testing ground whose desert area still contains yellow signs warning of radiation at certain localities” (Simon, 1998).

## **CHAPTER 3**

### **METHODOLOGY**

This study examines the viability of private-sector development at the NTS while sustaining a state of nuclear testing readiness. My objective is to determine whether the introduction of private industry would be a viable alternative use for the Test Site. Qualitative research methods were utilized for this study. Multiple data collection procedures were used to include a thorough review of the relevant literature, in-person interviews, telephone interviews, the viewing of an NTS promotional video, e-mail messages, and observations performed while attending one of the NTS Development Corporation's Board of Directors meeting.

Additionally, I performed an extensive search of all relevant documentation within the DOE/NV community which proved to be quite a challenging feat. Although I was successful in obtaining numerous reference sources, being a Bechtel Nevada employee was not particularly an advantage in acquiring the reference material. I commenced this portion of my research by contacting the DOE/NV Public Reading Facility and the DOE/NV Technical Information Resource Center. Online research was conducted on DOE's Opennet database as well as the DOE/NV and Bechtel Nevada Intranet sites. Searches for certain documents, publications, and reports often led me to a time-consuming quest of the particular organizational unit which might have originated the

document in hopes of obtaining a copy. At times, I was even denied access to certain unclassified documents due to a variety of convenient reasons.

In general, I treated the literature not only as an authority of my topic of study, but also as a source of ideas. I pursued any and all relevant lines of research until I found that I was not discovering anything significantly new and different. As I progressed through my research, I looked for critical as well as supportive data as to provide a comprehensive review of this topic of discussion. I found few references to support the alternative of not allowing private-sector development on the Test Site (the military, for example, would never admit to such beliefs). The opponents' views were centered mostly in newspaper articles, consisting of suspicious comments noted by certain groups such as Citizens Alert. The vast majority of literature favored diversification of the NTS to include the introduction of private industry. The results of my literature review are referenced throughout this study, particularly in Chapters 2 and 4.

In addition to the above-mentioned literature review, a number of in-person and telephone interviews were pursued. Selection of the interviewees included determining who to interview, who would be accessible, who would be willing to provide information, and/or who would shed light on the issue being explored based on his/her accomplishments. Gaining access to interviewees was one of the most challenging parts of doing this professional paper. Often times, individuals either did not have the time or were simply not willing to cooperate in this research effort.

In spite of the many obstacles I encountered in scheduling the interviews, five one-on-one interviews were conducted with the following interviewees, all who hold good



standing in the business community: Janice Wiedemann, Vice President of the NTS Development Corporation; Troy E. Wade, Chairman of the Nevada Alliance for Defense, Energy, and Business; Pete Mote, Director of the Nevada Testing Institute; Anthony E. Hechanova, Ph.D., UNLV Nuclear Engineering; and Elaine Mew, a Bechtel Nevada representative for the Office of Strategic Development and Communications. All interviews were conducted at each individual's office. Interviews ranged in duration from one to two hours. The first couple of interviews were open-ended in nature since they were performed toward the beginning of my research and I was primarily interested in accumulating as much information as possible. As I progressed in my research, questions arose for which I needed specific answers, and eventually this led to a more formalized set of questions. Thereon, subsequent interviews became more semi-structured. Throughout these interviews I recorded all information by way of note taking. Overall, these interviews proved to be very informative and I was impressed by the level of enthusiasm the interviewees expressed when relating their business promotion efforts.

Additionally, numerous telephone interviews were conducted to include: Sarah Besser, Senator Bryan's office; Hugh Ferrere, Senator Reid's office; Earl Hotch, DOE official; Clell West, former Chief of the Las Vegas Fire Department; Martha DeMarre, Bechtel Nevada manager; Rose McKinney-James' assistant, Corporation for Solar Technology and Renewable Resources; Dr. Don Bepler, UNLV Harry Reid Center for Environmental Studies; and Lynn Johnson of the Nye County Economic Development Office, among others. Their overall perception of private-sector development at the NTS was one of optimism and enthusiasm.

Due to my work experience as a Bechtel Nevada employee, I must admit that I entered this research effort with certain biases. Nevertheless, every effort was made to ensure objectivity. I was surprised to learn about the number of private-sector initiatives presently under pursuit of which I had little or no knowledge. In summary, this research effort proved to be a rewarding one in which I gained a much better understanding of the role played by the NTS — its historical significance and its future potential for southern Nevada.

## **CHAPTER 4**

### **PRIVATE-SECTOR OPPORTUNITIES**

This chapter examines various private-sector opportunities being pursued at the NTS. The projects being pursued at the NTS can be categorized as: (1) aerospace activities, (2) alternative energy research, (3) seismic simulation technology, (4) first-responder training, and (5) other business opportunities. These five areas represent possible future missions for private-sector development at the Test Site. The NTS Development Corporation is presently studying their feasibility as potential tenants of the Test Site.

Two specific locations at the NTS that have been designated for private-sector use: (1) a 2,000-acre industrial park located near Mercury at the southern entrance to the Test Site and (2) a location inside the Test Site's main entrance. Additionally, 800 acres of land at Areas 18, 22, and 23 have been reserved for Spaceport Nevada--the site of future aerospace activities. The concept of Spaceport Nevada was conceived by the NTS Development Corporation, and is supported by the Nevada Legislature (Nevada Assembly Joint Resolution No. 8, 1999). A science and technology corridor has also been proposed for Nye County along U.S. 95 on the western edge of the Test Site (J. Wiedemann, personal communication, February 26, 1999).

The NTS Development Corporation has taken initial steps to develop the Desert Rock Sky Park, a 2,000-acre site located near the Test Site's Desert Rock Airport. The site is ideally suited for companies in the aerospace, energy/environmental, and chemical fields. "Located only five minutes from U.S. 95, the site is far enough removed from any population centers, yet easily accessible by truck or air" (NTSDC, 1998d).

### **Aerospace Activities**

#### **Kistler Aerospace Corporation**

In June 1996, a Memorandum of Understanding was signed among DOE/NV, Kistler Aerospace Corporation, and the NTS Development Corporation to work together towards allowing Kistler to utilize the NTS for licensed aerospace vehicle operations. While Kistler considered other potential commercial spaceport locations worldwide, it found the NTS unique in terms of its overall project compatibility, safety, and environmental sensitivities (DOE/NV, 1996e). With hundreds of communications satellites scheduled for orbit over the next decade, competition has increased among aerospace companies. Kistler believes it will have the competitive edge when it begins launching its K-1 reusable rocket at the NTS and in southern Australia (Caceres, 1999).

Kistler, a Seattle-based company, is run by an impressive team of scientists and engineers. Its chief executive officer, George Mueller, was former director of NASA. Kistler's Vice President, Jack Gregory, is familiar with the NTS having commanded the Nellis Air Force Base from 1981 to 1983 (Kistler Aerospace, 1998). "In addition to its designation as a no-fly zone for commercial aircraft," Gregory said "The Test Site is ideal

for rocket launches because it is 6,000 feet above sea level. That means the company can save the fuel costs it would have had to spend by launching at a lower altitude” (Asia Pacific Space Report, 1998).

Kistler would use the NTS as a launch site to deliver communications satellites into low-earth orbit. The company anticipates building a launch pad and several buildings for flight control and assembly, representing a \$45-million investment for Spaceport Nevada. Kistler was attracted to the NTS by the availability of utilities (unlike remote sites elsewhere) and an existing infrastructure. Additionally, these types of launches require restricted airspace and many square miles of flat open land for the rockets to return which are readily available at the NTS (BN, 1998). Kistler would become the second commercial venture at the test site (Fluid Tech being the first) and the largest one so far.

Kistler would use about 12,000 acres of land in the north-central portion of the NTS for its two-stage rocket launches. The Kistler launch area will be located specifically at the northeast corner of Area 18 of the Test Site. The first stage of the rocket is intended to return to the Test Site only about eight minutes after the launch. The second stage, which will propel the satellite into orbit, is designed to return about 24 hours after the launch. The K-1 rocket system, pioneered by Kistler’s George Mueller, is designed so the launch vehicle and components return safely to the NTS, landing on air-bag cushions (Proctor, 1997).

The Kistler project intends to launch satellites into low orbits for wireless voice communications, video, and data transmissions. Kistler could put communications satellites into space by the year 2000 and, for the first time, return the reusable two-stage

spacecraft to the launching pad (Nevada Business Journal, 1997). The project would lower the costs behind any communications equipment that relies on satellites, including cellular phones, because the K-1's reusable features "reduce the cost by at least 50 percent of putting a vehicle into orbit" (Manning, 1998a). The K-1 is designed so that its engines can be used for 20 launches and its chassis can withstand 100 flights. In turn, Kistler plans to undercut its competitors' costs because of the expected longevity of the K-1 rocket (Manning, 1998b).

Kistler Aerospace is undergoing a Federal Aviation Administration (FAA) licensing process before it can begin flight operations from the NTS. Licensing is pending. Kistler plans to begin construction at the NTS after 1999 if the FAA grants permission for its reusable spacecraft. The FAA wants to make sure the launches are safe before licensing Kistler to use the NTS. The DOE should know by the end of 1998 whether the NTS will become a new home to this space shuttle. Kistler is currently building a spaceport in Australia, pending FAA approval to launch from the Test Site (Manning, 1998b).

In August 1998, Congress passed the Commercial Space Act which, if it becomes law, would authorize the FAA Office of Commercial Space Transportation to license commercial retrievable space vehicles (BN, 1998l). The bill did not encounter any opposition. It was just a matter of writing legislation that never existed, allowing rockets to launch and land in the United States. "The Act would help reduce the cost of expensive, one-shot boosters in current use by allowing a company such as Kistler Aerospace to launch commercial satellites and recover the reusable launching craft" (Manning, 1998a).

The NTS Development Corporation and Kistler Aerospace signed an agreement on October 23, 1998, giving Kistler permission to operate a spaceport on 12,000 acres at the NTS (Las Vegas Review-Journal, 1998). This agreement enables Kistler to finalize permits and licenses needed to start construction in late 1999 of a commercial space launch facility in Area 18 of the NTS. "My goal now is to launch in the year 2000 at the Nevada Test Site," said Kistler Vice President Jack Gregory (Launchspace, 1997b).

Kistler's proposed venture has received support from many legislators. The Nevada Legislature, in particular, has expressed support of Kistler's future aerospace operations at the NTS by approving Nevada Assembly Joint Resolution No. 16 (1997).

Kistler could provide Nevada up to 2,000 new jobs, including support businesses, and generate \$3 billion a year into the state's economy (BN, 1998l). According to Senator Reid, "Kistler's potential impact on Nevada's business growth and development would be tremendous." Reid added, "If Kistler's spaceport is built at the NTS, it will help the United States corner up to 65 percent of the estimated \$60 billion that will be spent worldwide on the commercial space sector by 2000" (Manning, 1998a). At present, all satellite launchings take place outside the United States. A spaceport at the NTS also would attract other support industries, generating high-tech jobs and millions in revenues. The spaceport itself would be operated by up to 75 scientists, engineers, and technicians (Asia Pacific Space Report, 1998).

"Though Kistler's presence at the Test Site would initially only add about 100 jobs, it would attract national and international attention to the NTS in addition to attracting support companies, hence more jobs" (Cruz, 1998c). Vice President Gregory

agrees that the K-1 rocket has the potential to help create a local aerospace industry (DOE/NV, 1996e). "The rocket's presence could produce spinoff industries in the Las Vegas area. A liquid oxygen supplier for the launches is one possibility," commented J. Wiedemann, Vice President of the NTS Development Corporation (personal communication, February 26, 1999).

### VentureStar

On September 8, 1998, the NTS Development Corporation announced a bid to locate a launch and recovery site for VentureStar at the NTS (Cruz, 1998d). VentureStar is a full-scale replacement for the space shuttle which can operate in a manned or unmanned mode (NTSDC, 1998h). A Lockheed Martin project, "VentureStar is a space-plane powered by a new rocket propulsion system that incorporates aerodynamic controls for flight in the earth's atmosphere and rocket propulsion for control in outer space" (BN, 1998l). It is the first fully reusable single-stage orbit launch vehicle. Unlike the space shuttle, it will not drop tanks and rocket boosters along its flight path. It will land and take off from the same facility (Cruz, 1998c).

Nevada is competing against 14 other states to become one of the launch and landing sites for VentureStar, which could dramatically lower the cost of space travel (Rogers, 1998c). The NTS Development Corporation submitted its response to a Request for Qualifications for site manufacturing, assembly, and launch services at the NTS. Lockheed Martin will seek competitive bids for two sites: an assembly and launch/recovery site and a second launch/recovery site. According to the NTS Development



Corporation, a decision is expected to be made by the end of 1999 and two different sites will be chosen (NTSDC, 1998h). If awarded, VentureStar will become Spaceport Nevada's second potential tenant.

"The Nevada Test Site is the ideal place to host America's newest and most innovative space technology venture," stated Senator Reid (Manning & Preston, 1998). The benefits of the Test Site location are: (1) high elevation (5,600 feet), enabling VentureStar to deliver heavier payloads higher than launch sites at sea level thus consuming less fuel; (2) excellent weather, providing launch window availability; (3) restricted air space; (4) high security; (5) scarce population overflight; (6) remote location; (7) existing technical and scientific infrastructure, including Desert Rock Airport and Mercury facilities; (8) spaceport authorization; and (9) proximity to a major city (NTSDC, 1998g; NTSDC, 1998i).

VentureStar is a reusable shuttle, powered by liquid hydrogen and oxygen fuels. A single VentureStar vehicle can be launched up to 250 times. This characteristic would give VentureStar an advantage, since it is said that the demand for satellite launching capabilities is expected to dramatically increase by 2004 with the advancement of communications technology (Rogers, 1998c). VentureStar will be an automated delivery system for hauling satellites and equipment into orbit 200 to 2,000 miles above earth (Batt, 1998; Cruz, 1998d). "It delivers customer 'payloads,' such as satellites, into low-earth orbit (used for communications equipment like pagers) or geosynchronous orbits ..." (Rogers, 1998c). VentureStar could be launched into orbit at one-tenth the cost of current space shuttle launches; it has the ability to lift 50,000 pounds of payload for \$1,000,

whereas right now it costs \$5,000 to \$10,000. The V-shaped VentureStar would be launched vertically like a rocket and land horizontally like an airplane (Batt, 1998; Cruz, 1998d).

Lockheed Martin has developed a demonstration craft, the X-33. The X-33, a scaled-down version of VentureStar, is expected to make its first test flight early in the year 2000 and the first launch into space would take place by 2004. The project targets 40 launches per year spread between two launch sites. Each site will serve as a backup to the other for landing the space plane in the event of bad weather (Batt, 1998; Manning & Preston, 1998).

Construction of Nevada's spaceport would begin in 2000-2003. VentureStar's launch and recovery site is planned for Area 18. The Desert Rock Airport would serve as its runway. Mercury, Nevada, would house its assembly and administrative facilities (NTSDC, 1998i).

Notwithstanding Lockheed Martin's original schedule to launch in 2004, the X-33 experimental vehicle reportedly suffered a five-month delay in the delivery of its engine. Moreover, the project recently experienced technical problems, pushing back the test flight schedule more than a year, according to Lockheed Martin executives (Leeds, 1999).

In spite of these setbacks, Lockheed Martin plans to proceed with its Request for Proposal in late 1999. The NTS Development Corporation is actively working toward obtaining the necessary state and local political support (J. Wiedemann, personal communication, February 26, 1999). Bill Monahan, President of the Nevada Alliance for Defense, Energy, and Business was recently quoted as saying, "It's a fabulous

opportunity. But it will be an expensive proposal and if the test site is chosen as one of the finalists . . . . would need the support of state government and private business” (Cruz, 1998d). The estimated cost of submitting such a proposal is approximately \$5 million. Intent on winning this proposal, Gerry Johnson, DOE/NV Manager; John Mitchell, Bechtel Nevada President and CEO; and Troy Wade, Nevada Alliance for Defense, Energy, and Business Director, set out to Carson City on March 15, 1999, to request the legislature’s financial support and a competitive package of economic incentives (T. Wade, personal communication, March 9, 1999).

VentureStar offers several benefits to Nevada. First, about 2,000 to 4,000 jobs could be created, many of these which would be high-paying technical and scientific jobs. “While 2,000 jobs could be created, the actual employment depends on how many companies come to put payloads on the shuttle” (Batt, 1998; Manning, 1998). Second, VentureStar is expected to generate an economic activity on the order of \$3 billion a year (Manning & Preston, 1998). Third, this project could potentially lead to the attraction of other launch service and payload processing providers. And fourth, aside from the economic diversification it would bring to Nevada, it could enhance the University and Community College Systems by providing an opportunity to expand educational technologies (NTSDC, 1998i).

### **Alternative Energy Research**

#### **Solar Technology**

The NTS has physical resources and technical capabilities that distinguish it from other testing and demonstration facilities in the United States. Some of these assets

(physical characteristics, site infrastructure, facilities, intellectual assets) combine to make the NTS uniquely desirable as a research, development, and demonstration laboratory for alternative energy technologies (BN, 1996a). Alternative energy technologies refer to “those advanced energy systems that improve the effectiveness of energy service through reduced fuel use, higher levels of economic efficiency, and reduced emissions of greenhouse gases and regulated pollutants” (Sustainable Energy Strategy, 1995).

Even the environmental “watchdog” group Citizen Alert, one of the Test Site’s biggest opponents, was said to have commended the change occurring in the NTS from testing nuclear weapons to researching renewable fuels. “My hope is it would help expedite alternative fuels from research and development to practical applications for the population,” Rick Nielsen, Citizen Alert executive director, said (Manning & Kanigher, 1998).

DOE/NV has established partnerships with various entities (the state of Nevada, the University and Community College Systems of Nevada, the Corporation for Solar Technology and Renewable Resource [CSTRR], the NTS Development Corporation, local governments, commercial enterprises, and energy systems stakeholders) to promote the NTS as a Center of Excellence for alternative energy technologies (DOE/NV, 1998g).

#### Solar Enterprise Zone

In 1992, Congress passed Section 3137 of the National Defense Authorization Act, Public Law No. 102-484. The passage of the Energy Policy Act of 1992 provided incentives for investment in the development and use of alternate and renewable energy technologies (DOE/NV, 1994b). This legislation required that a feasibility study be

conducted on the conversion, development, and utilization of the NTS as a commercial facility for the development of solar energy research and production technologies. The NTS Solar Feasibility Study (1994) included recommendations for creating a national Solar Enterprise Zone (SEZ) in Nevada.

The SEZ was tasked with providing local employment and economic benefits to offset the downsizing experienced by the NTS. The SEZ would also aid in the solar industry's attempt to commercialize the use of renewable energy. Other outcomes would include a sustained solar energy industry in Nevada and solar energy exportation from the SEZ to meet the growing demand for power in the Southwest (DOE/NV, 1994a). At present, the concept of the SEZ has been suspended pending the outcome of deregulation among the utilities. "Other ventures, such as the Solar Enterprise Zone, are on hold," said a DOE official, Derek Scammell. "With the utility company monopoly breaking up, the cost of electricity might drop and solar power might not be a good sell," he added (Kopytoff, 1998).

The designated SEZ Task Force analyzed the Test Site's potential as a solar resource, not only to provide local employment and economic development opportunities but also to develop technologies with considerable export potential. It was determined that the NTS is particularly well suited to serve as a development and demonstration center for solar power technology. The NTS enjoys exceptional weather (over 300 clear days per year), and receives nearly the highest insolation of any site in the United States. Moreover, its remoteness reduces problems associated with land use, vandalism, and the buildup of urban pollution on solar collectors (DOE/NV, 1994a).

Furthermore, this study concluded that “with early and sustained support to develop these technologies, introduce them in the market, and create demand, the solar power industry would be able to rapidly develop competitive solar-based products and power-generating installations” (DOE/NV, 1994b). “The NTS would require an initial investment in power transmission facilities and backup fuel provision. However, with these investments in place, the NTS would be an unmatched solar enterprise zone, providing a positive environment for the demonstration and commercialization of solar technologies” (DOE/NV, 1994a).

#### Corporation for Solar Technology and Renewable Resources

CSTRR is a non-profit corporation created by the SEZ Task Force and funded by a \$3-million grant from the DOE. CSTRR represents the culmination of one and a half years of work undertaken at the request of Senators Richard Bryan and Harry Reid to assess the commercial energy potential of the NTS [Online: <http://www.cstrr.org/>]. That assessment concluded that the NTS offers outstanding solar energy resources (DOE/NV, 1994a).

CSTRR’s President and CEO Rose McKinney-James promotes, “We have a wonderful opportunity to establish Nevada as a world leader in the advancement of solar energy technology and power generation . . . ” (CSTRR, 1997-98).

Solar power is a clean, affordable, and versatile energy source that offers several benefits to energy customers as well as to our communities -- providing an efficient use of a natural resource, low operating costs, and no air, water, or noise

pollution impacts . . . . University studies have shown the use of solar technology can cut carbon dioxide emissions by thousands of tons (McKinney-James, 1998).

The mission of CSTRR is to facilitate the commercialization of solar and renewable energy technology in southern Nevada. CSTRR offers access to land, low-cost capital, public appropriations, foundation funds, and other targeting investment funds to potential project developers (CSTRR, 1997). According to a recent market survey, potential customers of solar power are identified as the DOE, the Department of Defense, Native Americans, public utilities, and various commercial retail customers [Online: <http://www.cstrr.org/>].

In 1995, CSTRR issued a Request for Proposals to develop solar energy projects at the NTS and other locations. The NTS and the other Southwest sites were selected for their outstanding solar energy resources as well as the availability of land and access to transmission grids. CSTRR offered assistance to firms that have developed solar or other energy technologies and have products ready to introduce into the market (BN, 1996a).

CSTRR has successfully brought the potential for solar energy to the attention of elected officials, businesses, and industry leaders (CSTRR, 1997b). In turn, the Nevada Legislature has demonstrated its commitment to solar power and CSTRR's efforts by passing several measures to further the solar industry in Nevada "including property tax incentives, residential net metering, and a domestic energy portfolio standard to encourage the long-term development and use of solar systems" (CSTRR 1997c). "CSTRR will put Nevada on the cutting edge of solar energy production and development. Nevada, with its abundance of sunshine, has the potential to become our nation's center for solar

technology development,” states Senator Richard Bryan (CSTRR, 1997a). Senator Bryan’s leadership and vision led to the creation of CSTRR.

By the year 2010, approximately 70,000 new jobs will be created as a result of “a new demand for photovoltaics (the technology and process of converting sunlight into energy), solar water heater, and related technologies” (CSTRR, 1997).

CSTRR has a long-term goal to deliver 1,000 MW of solar electricity to domestic and international markets (CSTRR, 1997a). A task force was appointed to review an initial 1,000-MW SEZ. It was concluded that an initial target of developing 100 MW would be undertaken as a first step toward the 1,000-MW long-term goal. In October 1997, CSTRR awarded Amoco/Enron Solar Project Development the project of developing a 10-MW photovoltaic plant at the NTS. “The plant will be built in several stages, with the first megawatt operational in mid-1998. The power produced at the site will be purchased by the DOE and used to meet the needs of the NTS complex” (CSTRR, 1997d).

CSTRR continues to promote grid-connected and stand alone renewable energy applications, although efforts to market solar power to DOE for use on the NTS have been suspended (Kopytoff, 1998).

#### Center for Sustainable Technology

The Center for Sustainable Technology was a consortium made up of Bechtel National of California and the non-profit Electric Power Research Institute of Palo Alto, California. This center was formed to help companies commercialize their ideas for new technology in the areas of renewable energy, energy management, environment, and



transportation. It also developed new projects and provided consulting services in the areas of research and development and technical and business consulting. "One of the Center for Sustainable Technology's goals was to bring new projects to the Test Site to keep the highly skilled work force employed on challenging scientific projects" (DOE/NV, 1996d). This Las Vegas-based organization was engaged in "matching the fledgling technologies with firms capable of developing them and bringing them to market." It also helped those firms use the resources available at the Test Site (Steinhauer, 1996b).

This consortium had worked with a Reno-based company, energy consultant Arthur D. Little, and the University of Nevada to develop vehicles that could run on a clean-burning fuel consisting of hydrogen and natural gas. "We think there's opportunity in developing Southern Nevada as a center for alternative fuels," said Ken Partain, President of the Center for Sustainable Technology" (Steinhauer, 1996b).

The Center for Sustainable Technology recently relocated to San Francisco "due to federal contracting restrictions and bureaucratic 'red tape' obstacles," according to Pete Mote (personal communication, February 17, 1999).

### Hydrogen Research

The goal of the hydrogen research program is to produce hydrogen fuel in sufficient quantities to power most vehicles that now rely on dwindling petroleum supplies. Solar power dishes, similar to satellite television dishes, would be lined up at the Test Site. Using the electricity that could be generated from the dishes, water could be electrolyzed, splitting its components--hydrogen and oxygen--to draw off hydrogen, a clean-burning fuel (BN, 1996a).

According to the American Hydrogen Association, Nevada could eventually be richer than Saudi Arabia by making and selling solar hydrogen (hydrogen produced by the sun or other renewable energy sources). Nevada's climate might be capable of producing endless supplies of solar hydrogen (NTSDC, 1997b).

The NTS Development Corporation is working with several firms on projects dealing with hydrogen and other alternative fuels. One such firm is known as TDM. TDM manufactures equipment for the auto industry. The NTS Development Corporation and TDM are negotiating an agreement that would allow TDM to test its own alternative fuel vehicles at the NTS (NTSDC, 1997b). Another firm working closely with the NTS Development Corporation is Rocky Research.

#### Rocky Research

Rocky Research, a national leader in the field of thermodynamics since 1985, is a research and development/engineering firm based in Boulder City engaged in thermal refrigeration and air conditioning equipment (NTSDC, 1997a). Rocky Research develops natural gas and hydrogen-fuel chiller (refrigeration) systems to cool large commercial buildings. The systems are designed to burn natural gas, a gas mixed with hydrogen and pure oxygen. Uwe Rockenfeller, president of Rocky Research, says the new technology is expected to be 50 percent more efficient than products on the market today. Rockenfeller described hydrogen as an environmentally friendly fuel. "It has 'zero' impact on ozone depletion and contributes nothing to global warming," he said. "The only byproduct is water . . . . The Test Site is the ideal proving ground for these technologies." Rockenfeller plans to test these systems on buildings on the Test Site (Edwards, 1998).

In May 1998, an agreement was signed among Rocky Research, Oak Ridge National Laboratory, and the NTS Development Corporation to help facilitate alternative reusable fuels, e.g., the Triple Effects Chiller (Cruz, 1998b). Additionally, "Rocky Research is helping a joint venture of several natural gas companies, including Southwest Gas Corp. of Las Vegas, develop gas air conditioning units for residences in order to reduce peak electric loads" (Edwards, 1998).

The October 1998 issue of *The Globe* reported that the NTS Development Corporation has facilitated to Rocky Research the lease and equipment transfer for use in its commercial laboratory. The engineering firm utilizes the leased Test Site equipment to provide analyses services for refrigerants, lubricants, and absorption chiller systems. "Access to the equipment has enabled the company to assume responsibility for all of the Union Carbide Corporation's heat transfer fluid analysis, previously performed in West Virginia." Senator Reid recently visited the Rocky Research facility and commented, "The Rocky Research project is an example of what needs to be done to put the vast resources of the Test Site to use" (NTSDC, 1997b).

In addition, the NTS Development Corporation has entered into a partnership that will enable the local company to develop, and possibly manufacture, small appliances such as vending machines that can be powered by alternative fuels and used in areas with little or no access to electricity. Rocky Research employs 25 scientists, engineers, and technicians (Cruz, 1998b).

### NRG Technologies, Inc.

NRG Technologies, Inc., is a Reno-based company, formed in 1996, engaged in developing alternative fuels for use in motor vehicles. NRG Technologies is the only northern Nevada company that has expressed interest in working at the Test Site. It plans to use the Test Site to develop hydrogen-powered vehicles and hopes to use the Test Site's fleet of vehicles to test their technology in a more realistic setting. "It's a good place to test new fuels . . . that you don't want to risk putting out on public roads," said NRG President Kirk Collier (Simon, 1988). "NRG Technologies has been able to get a better deal on the facilities it needs to conduct advance research from the NTS Development Corporation than it would from private financiers who seek collateral and profit potential from their investment" (Steinhauer, 1996a).

NRG Technologies initially demonstrated, within a laboratory setting, that a mixture of hydrogen and natural gas fuel could be used to power cars and trucks with near-zero emissions. It then set out to demonstrate this technology by converting a new Ford F-150 pickup truck to run on this fuel mixture. The truck produced no measurable carbon monoxide emissions and extremely low nitrogen oxide emissions. The pickup truck was later tested in 1977 at the Las Vegas Motor Speedway where the vehicle exceeded 100 mph on the experimental fuel (Kanigher, 1998).

In early 1997, NRG Technologies received a \$250,000-research grant from the DOE and proceeded to seek a \$150,000 agreement with the NTS Development Corporation to help the company produce "a marketable product" (NTSDC, 1997b).

Later that same year, the NTS Development Corporation signed a three-way Memorandum of Cooperation with the Las Vegas Motor Speedway and the DOE to test this technology.

In 1999, NRG Technologies will begin testing approximately five different vehicles at the Test Site using its clean-burning alternative fuel. Known as HCNG, the fuel is 30 percent hydrogen and 70 percent natural gas. NRG Vice President Neal Mulligan said the company would take advantage of Test Site technicians and equipment to help perfect a fuel injection system that could handle the HCNG fuel. "Being a small company, the advantage of using the Test Site is one-stop shopping . . . . the NTS has excellent technical support," Mulligan said. Mulligan added that if the HCNG fuel were ever perfected, it would cost about the same as gasoline. Also, vehicles would go longer without oil changes and there would be less stress on the engine. Moreover, air pollution would be reduced since the HCNG fuel would not emit any carbon monoxide (Kanigher, 1998).

#### Hydrogen-Enriched, Lean Burn

In 1997, the NTS Development Corporation entered into a partnership with a consortium of companies and agencies, including the DOE, NRG Technologies, Inc., of Reno; Arthur D. Little, Inc., of Cambridge, Massachusetts, Energy Partners Group of Carson City; and the Desert Research Institute. The purpose of the consortium was to study the possibility of using hydrogen fuel to operate stationary power generators and automotive engines. Hydrogen-Enriched Lean Burn (HELB) hopes to use the Test Site to demonstrate hydrogen-enriched natural gas programs. Hydrogen is a renewable energy

source which is 50 times cleaner than the current industry standards (NTSDC, 1998b).

“HELB (formerly known as SPOT--Stationary Power on Time) has the potential to virtually eliminate pollution while significantly reducing electric costs” (NTSDC, 1988b).

### **Seismic Simulation Technology**

#### **Nevada Testing Institute, Inc.**

In August 1998, a series of seismic tests took place at the NTS to demonstrate a novel seismic simulation technique. These tests were well received by the NTS community. A Bechtel Nevada official stated, “These experiments are an exciting start to providing a much better understanding of the effects of earthquakes on buildings and other structures.” The tests were conducted by the Nevada Testing Institute, Inc. (NeTI) (BN, 1998k). NeTI is a non-profit Nevada research institute formed in April 1996 to sustain and enhance the Test Site’s core competencies through partnering and commercialization. NeTI works with private industries interested in advancing drilling and excavation techniques, explosive technology, and seismic and utility research (NeTI, 1998a).

During the series of seismic tests and in addition to proving the ground motion technique, several structural and geotechnical experiments were conducted on the test bed to take advantage of the ground motion. A DOE press release issued in September 1998 stated, “Preliminary evaluation of the test data showed that realistic earthquake-like ground motions were achieved and the tested structures responded in realistic fashion.” “We have shown that our method of ground motion generation can be used efficiently to produce tailorable, repeatable ground motions in an in-ground test bed,” said NeTI

President Pete Mote. "Now we are seeking partners interested in applying this exciting capability to a facility capable of testing a variety of full-scale structures" (DOE/NV, 1998f).

Since 1995, NeTI and its partner, SRI International, have been evolving a unique concept of generating earthquake-like ground motion to test large- and full-scale structures. Development of this capability is intended to reduce loss of life and property in earthquake-prone regions. A testing center capable of hosting full-scale structures and testing these structures by shaking the ground they are supported on is said not to exist anywhere in the world. NeTI has been developing such a center at the NTS that will put the United States at the forefront of state-of-the-art, full-scale seismic engineering testing. "The center would deploy the RESCUE (Repeatable Earth Shaking by Controlled Underground Expansion) technique, developed by SRI and funded by the National Science Foundation. Because the testing center will be a major contributor to meeting the federal earthquake mitigation goals and will be a major national structural testing asset, NeTI is seeking financial support from the federal government for construction of the testing center" (NeTI, 1999).

NeTI plans to build a facility at the NTS large enough to test full-scale structures. The proposed site for this facility is in Area 5 at the NTS. "One of the great advantages of working at the NTS is that an incredible variety of construction, support, and diagnostic equipment is on the site," commented NeTI President Mote (personal communication, February 17, 1998). NeTI has already established a consortium of organizations (academia, research institutes, government, private-sector industries, and international

users) to design, test, and construct the ground motion generation test bed for evaluating seismic responses. "The market for a full-scale test facility is clearly there," said Mote. The final development of the center is projected to be a five-year program scheduled for completion in the year 2004. Industry participants include electrical utilities and those involved in the promotion of various construction products (P. Mote, personal communication, February 17, 1999).

#### Miners Training Center

The International Underground Miners Training Center was established in 1996 to help meet a resurging demand for skilled underground workers that has been difficult to fill with the available workforce. The Center is funded by the Southern Nevada Local #872 Laborers Training Trust Fund (NeTI, 1998b). NeTI President Pete Mote stated that this miners training center fills a unique national void since there is no other underground mining school in the nation. It is expected to gain recognition worldwide. A valued added to this type of training center is that it would allow for mining skills to be sharpened which would be necessary if nuclear testing were to resume (P. Mote, personal communication, February 17, 1999). In July and August 1998, NeTI coordinated two special sessions of the certified mine trainee program at the NTS. Attendance at both miners training session was quite high and both sessions were perceived to be successful as reported in the August 1998 issue of *SiteLines*.

#### Land Mine Detection Research

In 1998, the DOE, Lawrence Livermore National Laboratory, and the University of California, Irvine collaborated on a project to demonstrate at the NTS a civilian version



of mine detection technology used in Russia. This technology was developed during the Cold War to detect anti-tank mines. The goal of this project was to demonstrate a faster, more efficient technique for the detection and neutralization of anti-tank mines (DOE/NV, 1998d).

This technique provides a faster, more efficient means of finding anti-tank mines. The current technology involves the use of metal detectors, chemical-sniffing dogs, and wooden sticks to locate and probe for mines. "By using robots and improved sensing techniques, the scientists hope to deploy a new generation of detectors" (Rogers, 1998a). The main advantage of the Russian technology is its ease and mobility — it can scan 10 times faster than a person using a wooden stick, and explosives-sniffing dog, or a metal detector.

The land mine detection experiment was conducted at the Buried Objects Detection Facility at the NTS. This unique facility is owned by the DOE and operated by Lawrence Livermore National Laboratory. The facility covers 100 acres of which 30 acres are in a secure enclosed area. The secure area contains 296 mines (Rogers, 1998a).

Senator Reid has reportedly allocated \$4 million into the federal budget for further research into land mine detection to be performed at the NTS (DOE/NV, 1998d).

### **First-Responder Training**

In 1996, due to the rise in terrorist activities in America, Congress proposed that the federal government create a national center to train police, fire, and medical teams as

well as the news media, utility workers, and other professionals who are routinely part of a crisis event (Story, 1996).

In response to the national need for emergency response training, the NTS Development Corporation is promoting the NTS as a location where first responders could train together in response to national disasters and other weapons of mass destruction situations (NTSDC, 1998h). "We're hoping we will become the graduate school for this kind of training," said Greg Cook, communications specialist for Bechtel Nevada (Fink, 1999). NTS Development Corporation President, Tim Carlson, stated that a proposed First Responder Training Center would be a perfect use for the NTS. "The Test Site is perfectly positioned to utilize potentially available federal funding to train emergency response workers to deal with terrorist attacks and other safety and security issues" (Pahrump Valley Gazette, 1996). Gary Stinson, President of SO Technologies, Inc., a Bechtel Nevada subcontractor, agrees:

The Nevada Test Site is absolutely perfect for a training center like this. It's remote and secure, and it has ready-made facilities both above and below the ground for these types of activities. By using existing facilities and expertise, time and money can be saved. That money could then be used by private companies and the national laboratories to further their research into new techniques and technologies to combat terrorism. Most importantly, we have talented people with high technology capabilities that cannot be found anywhere else in the world (Story, 1996).

“We’ve been training first responders for 20 years or better in a limited program,” said Steve Ronshaugen, director of DOE/NV’s Emergency Management Division (Story, 1996). Bechtel Nevada further promotes, “The NTS offers the most cost-effective and operationally effective answer to the urgent national need” (BN, 1997a).

In May 1998, the NTS became part of a national network designed to help emergency first responders prepare to deal with chemical, biological, radiological, and explosive weapons of mass destruction. The consortium will play a lead role in preparing individuals to respond to acts of chemical, biological, or nuclear terrorism. Comprised of the NTS, the National Center for Biomedical Research and Training at Louisiana State University, the Energetic Materials Research and Test Center at New Mexico Institute of Mining and Technology, the National Emergency Response and Rescue Training Center of Texas A&M University, and the National Center for Domestic Preparedness at Jacksonville State University in Alabama, this consortium will be able to pool resources from across the country. Senators Reid and Bryan support the formation of the National Domestic Preparedness Consortium (BN, 1998c).

To date, four first-responder training sessions have been conducted at the NTS. The courses offer both instruction and field exercises on terrorism; conventional, nuclear, chemical, and biological agents; protection from such agents; and the wear and care of protective equipment. Emergency response professionals at the NTS stage realistic accident scenarios with simulated hazardous conditions to generate the kind of conditions found in actual crisis situations. These scenarios help prepare individuals for real-life emergencies. First responders are taught how to identify an attack involving biological,

chemical, or radiological materials; how to prevent such an incident; and how to deal with the consequence to minimize casualties (BN, 1998g; BN, 1999a; NTSDC, 1998f).

Additionally, there is a Counter-Terrorist Training Program being developed to provide counter-terrorism training as part of the drive to use the Test Site (Fink, 1999).

“Recent terrorist events prompted Congress to authorize \$1 billion in 1996 to fight terrorism. Another \$4.7 million in federal money has come to the Test Site for its training program” (Fink, 1999).

### **Other Business Opportunities**

#### **Fluid Tech, Inc.**

Fluid Tech, Inc., is the first commercial tenant of the NTS. Fluid Tech, a Las Vegas-based company since 1985, specializes in the cleanup of equipment contaminated with low levels of radioactive waste and the development of decontamination technologies. The company recently developed a cleaning process that made it affordable to decontaminate equipment and save it from excess. The equipment could then be put back into active operations or transported to non-radioactive storage facilities (BN, 1998i).

Initially this company had built a facility in the town of Amargosa Valley, but was blocked from opening by local opposition. Fluid Tech began operations at the NTS (Area 25) in mid July 1998. By opening a facility at the Test Site, Fluid Tech has been able to have contaminated equipment shipped to its facility instead of incurring the expense of sending its employees to do the cleanup work at the customers' site (BN, 1998i). Fluid

Tech President, Dean Rowsell, said the Test Site is ideal for this sort of work because it is isolated from the public and has had a long history of dealing with radioactive contamination (NTSDC, 1998c).

“This is great milestone for the Test Site,” said DOE/NV Manager Gerry Johnson in a *SiteLines* interview. “We look forward to a long and cooperative relationship with Fluid Tech . . . we will put unused resources of the NTS to work, lower our overall infrastructure costs, and provide additional opportunities for skilled workers in Southern Nevada” (BN, 1998o). Fluid Tech’s operation at the NTS represents the first major success for the NTS Development Corporation.

Although Fluid Tech only employs approximately 50 people at present, its operation at the NTS has been so successful that it is considering further expansion at the Test Site (NTSDC, 1998h).

#### HAZMAT Spill Center

The HAZMAT Spill Center is a unique one-of-a-kind facility built to conduct hazardous materials testing and training under controlled conditions. It is the only place in the United States where federal agencies and private companies can test the characteristics of large quantities of hazardous liquids and gases (BN, 1997b). The HAZMAT Spill Center is also unique in that it is the only facility in the nation which has been granted a special permit authority under the Clean Air Act for conducting large-scale tests using hazardous materials (BN, 1996b). Favorable weather conditions, as well as its location far from populated areas, make the facility ideal for conducting large-scale, open-air hazardous and toxic testing and training.

This unique facility is available on a user-fee basis (Simon, 1998). Its primary potential customers include hydrocarbon, chemical, and petroleum refining industries; pharmaceuticals; chemical manufacturers; and other industries where dangerous or hazardous materials are involved (BN, 1996b).

Although the spill center has been operating for more than a decade, promoters have only recently started to market it intensively to private industry as part of the drive to commercialize the site (Simon, 1998).

#### Carbon Regeneration Facility, Inc.

Carbon Regeneration Facility, Inc., is a new California company that has expressed interest in doing business at the NTS. Its President, Bob Fund, is reported to be searching for financing to open its carbon regenerating plant at the Test Site. So far, the NTS Development Corporation has signed on as a partner in the venture (Kanigher, 1998).

Carbon is an element which is commonly used by a multitude of industries, yet it is becoming scarce worldwide. This has led Congress to recently pass a law to encourage the recycling of carbon. Carbon is used to filter out particulates when treating drinking and wastewater. It is also used by food processing plants to filter unwanted odors. The difficulty about working with carbon is that over time it tends to get dirty and then loses its absorption capabilities (Kanigher, 1998).

Carbon Regeneration Facility has developed a closed-loop process that cleans the carbon more efficiently than the rotary-kiln process used up until now. Unlike the kiln, which burns away some of the carbon, there is no loss of the substance using this process. Carbon Regeneration Facility foresees that there is a need and a market for its services.

Carbon would be shipped to its Test Site facility in one-ton increments. The company also plans to manufacture carbon. Carbon Regeneration Facility had projected to begin operations at the end of 1998, yet is still undergoing negotiations. It will start operating with 10 to 15 initial employees and expects that the work force could increase to as many as 100 in three to four years (Kanigher, 1998).

### **Nevada Science and Technology Corridor**

Industrial and public/private partnerships have been formed to promote the development of science and technology-based opportunities in rural southern Nevada communities. These partnerships will work toward the economic development of a Science and Technology Corridor to be located along U.S. Highway 95, from Pahrump and Indian Springs in the south to Tonopah in the north. "Government leaders in this rural area hope to capitalize on their remote location to bring high-paying jobs in high-tech fields such as aerospace and telecommunications" (Steinhauer, 1997).

The NTS Development Corporation has provided funding (approximately \$200,000) for several studies that will lead to the formation of this Science and Technology Corridor in Nye County, Nevada. Projects, such as the redevelopment of the Tonopah airport and master planning of the area surrounding it, and the completion of a telecommunications feasibility study, are in progress. In addition, a master plan is currently under development for an industrial park at the Desert Rock Airport facility, to be known as the Desert Rock Sky Park (NTSDC, 1998h). "These programs and projects all contribute to job creation and business attraction opportunities for rural communities

adjacent to the NTS,” stated Janice Wiedemann (personal communication, February 26, 1999). “Clark County is working toward obtaining an Economic Development Adjustment grant to support this venture” she added.



## **CHAPTER 5**

### **CONCLUSIONS**

As previously discussed, numerous changes have taken place in nuclear testing policy over the last decade. These policy changes and the decrease of federal monies to support the Test Site's operation have left many people unprepared to deal with the consequences of the nuclear testing moratorium. Tasked with the requirement to maintain a state of nuclear testing readiness, the question remained how best to utilize the Test Site's capabilities and infrastructure.

The NTS has unique properties that make it an attractive option for many high technological companies. The DOE/NV believes it can utilize the Test Site's resources, capabilities, and skilled work force to play a significant role in supporting and fulfilling certain national needs while sustaining a state of nuclear testing readiness. New private-sector activities are needed to maintain the NTS as a resource for the national defense. Furthermore, it contends that bringing to the Test Site projects similar to those described in Chapter 4 of this paper could be the first step in establishing the NTS as an international center for the development and testing of leading technologies.

To this end, the DOE/NV has undergone and continues to experience a shift in its organizational culture toward a more open, project-oriented approach to doing business. Evidence of this can be observed in the technological collaboration mechanisms available

for transferring NTS technology and expertise to the private sector, such as Cooperative Research and Development Agreements (CRADAs), Patent License Agreements, and Technical Consulting and Personnel Exchanges, among others.

Nevada's congressional delegates also support the introduction of private-sector industry at the NTS. Senator Reid, in particular, has played a very active role in promoting private-sector development as evidenced in the following quote: "I am committed to bringing the Test Site into a new era by marketing its potential . . . . I envision a public-private partnership that will enable the Test Site to become a national testing and demonstration center, with laboratories developing state-of-the-art technology for defense, businesses, renewable energy, mining, transportation, and the environment" (DOE/NV, 1996b).

During its few years of existence, the NTS Development Corporation has been quite successful in promoting the Test Site's capabilities to the private-sector industry. Many private-sector firms have expressed an interest in testing and demonstrating the viability of new products and processes. The NTS Development Corporation is committed to (1) creating opportunities for the growth of science and technology-based industries, (2) reusing the Test Site's assets for business purposes, and (3) enhancing the overall spirit of cooperation among government entities and the business community. The NTS Development Corporation continues to succeed in its economic development mission of job creation and reuse of NTS resources.

"Efforts to bolster test site commercialization could have been initiated earlier but Las Vegas, enjoying a boom in the casino industry, ignored the test site . . . because the

economy of Southern Nevada was so strong . . .” said Troy Wade (personal communication, March 9, 1999). At present, the NTS is at a key point in the transition from past underground nuclear testing to the support of stockpile stewardship and the introduction of new private-sector opportunities. Numerous private-sector industries are pursuing relocation to the NTS. The main activities being pursued include alternative-fuels research, launching communications satellites, finding new ways to handle dangerous chemicals, and testing and development of new technologies, among others.

In my opinion, the biggest advantage of making the NTS available to private enterprise is that it would bring scientific and technical industries and professionals to southern Nevada, thereby aiding in this area’s much needed economic diversification. Moreover, the attraction of new businesses could absorb many of the highly qualified employees who had previously been reduced in force due to the moratorium.

I believe that the Test Site’s future is directly dependent on the ability of business, industry, and government to effectively unite. Only through the collective efforts of all interested parties and stakeholders, can the NTS build a diversified business and technology base. Therefore, it is in everybody’s interest to support the development of private industry at the NTS. In summary, I feel confident that private-sector development at the NTS will begin to prosper in the near future.

After reviewing the relevant literature regarding the history and presence of the NTS, I would recommend the use of this strategically important U.S. installation for private-sector activities. Private-sector development at the NTS is a viable alternative for

this site's future. The key to the Test Site's survival is diversification. Only by promoting new programs and by fostering the exchange of information, expertise, and technology, can protection of this unique national asset be achieved.

It is my recommendation that additional study be conducted to examine the progress made regarding the introduction of private-sector industry to the NTS.

## APPENDIX I

### AN HISTORICAL PERSPECTIVE OF THE NEVADA TEST SITE

Shortly after World War II, relations between the United States and the Soviet Union began to decay, and the Cold War ensued. "Its most enduring legacy was the nuclear arms race. It began during the Manhattan Project, when the Soviet Union began to develop its own atomic bomb" (DOE Office of Environmental Management, 1995). The Soviet Union detonated its first nuclear device in August 1949. This early development of nuclear science by the Soviet Union was not expected by the U.S. government and created concern among high-level officials. "The threat to national security initiated during World War II led to the research, development, testing, and production of nuclear weapons and a variety of nuclear-related research projects" (DOE Office of Environmental Management, 1998).

The NTS was established in December 1950 by President Harry Truman as the continental location of the U.S. nuclear weapons testing and "development programs (Lay, 1950). This unique on-continental proving ground was originally named the Nevada Proving Ground (DOE/NV, 1995). This site was seen as a more convenient place to perform nuclear weapons tests, up to then performed on and near small islands in the Pacific Ocean. In addition, the NTS was chosen for this endeavor because of its remoteness, low population density, and predictability of local weather. According to Derek S. Scammell, editor of the *NTS News & Review* (1993), the Atomic Energy Commission (predecessor to the DOE) selected this southern Nevada site based on existing favorable conditions: "The site was already under government control, it was a

large area, had little rainfall, a low population density, and would be easy to protect against penetrators.” It is curious to note that these same features -- its remoteness, low population density, and favorable climate -- are being promoted at present when attracting new business to the Test Site.

Although most testing took place at the NTS, nuclear testing activities were also conducted at nine off-site locations in five different states:

- Alamogordo in New Mexico
- Amchitka Island in Alaska
- Central Nevada Test Area in Nevada
- Project Shoal in Nevada
- Project Salmon in Mississippi
- Project Rulison in Colorado
- Project Rio Blanco in Colorado
- Project Gasbuggy in New Mexico
- Project Gnome in New Mexico (DOE Office of Environmental Management, 1998).

The NTS occupies public lands that are “administratively held” by the U.S. Department of the Interior, Bureau of Land Management (BLM). This means that the lands are “owned” by the public, not the federal government. Nonetheless, the lands are under temporary use restrictions because they were loaned by BLM to the U.S. Atomic Energy Commission by way of four separate Public Land Orders (DOE/NV, 1995).

Public Land Order 805, dated February 12, 1952, reserved lands for the use of the U.S. Atomic Energy Commission as a weapons testing site. Subsequent withdrawals in 1958, 1961, and 1965 reserved the withdrawn lands for use of the Atomic Energy Commission in connection with the NTS. "The 1961 withdrawal was more specific in that it reserved the lands for use of the Atomic Energy Commission in connection with the NTS for test facilities, roads, utilities, and safety distances" (DOE/NV, 1996b).

In 1983, the U.S. Bureau of Land Management, in accordance with the Federal Land Policy and Management Act of 1976 (Public Law 94-579), conducted a review of the existing four land withdrawals that comprise the NTS. This review concluded that the lands were still being used for the purpose for which they were withdrawn (DOE/NV, 1996b).

The size of the NTS has been increased over the years through a series of land withdrawals. As stated in the Nevada Test Site Alternative Use Feasibility Study (1995), the Test Site is presently the "largest, contiguous piece of federally owned restricted-access land."

Eight hundred twenty-eight nuclear charges have been detonated beneath the landscape at the NTS, starting with small test charges in the 1950s. As reported in a special edition of the *NTS News & Review* newsletter, a total of 925 nuclear tests (including 24 joint U.S.-United Kingdom tests) was conducted at the NTS (Scammell, 1993). The majority of nuclear tests were not conducted simply to test the weapons themselves, but to measure the effects of intense radiation on everything from classified defense satellite components to Japanese architecture.

An April 1993 article in *NTS News and Review* stated that due to the high volume of testing taking place year round at the NTS, it became necessary to establish the DOE/NV. The Nevada Operations Office officially opened in Las Vegas on March 6, 1962. Its primary mission was to oversee and take responsibility for the operations and programs being conducted at the NTS.

Nuclear testing at the NTS was conducted in two distinct eras. From January 1951 through October 1958, most tests were conducted aboveground. Able was the name of the first nuclear tests at the NTS, consisting of a 1-kiloton bomb dropped from a bomber above Frenchman Flat on January 27, 1951 (BN, 1998b). "Nuclear tests were conducted aboveground in the 1950s because the methods available for obtaining vital measurements of device performance required long distances for line-of-sight observation" (DOE/NV, 1992). The United States stopped all testing on October 31, 1958, and the Soviet Union did the same on November 3, 1958. Nuclear testing was stopped as the result of separate, self-imposed moratoriums. The Soviet Union broke its moratorium on September 1, 1961, and the United States responded with renewed testing on September 15, 1961.

Due to concerns by the Atomic Energy Commission and the public about the long-term health consequences of radioactive fallout, methods were developed to contain detonations underground while obtaining the required information. Since 1961, most nuclear tests by the United States had been conducted underground. On August 5, 1963, the Limited Nuclear Test Ban Treaty was signed by the United States, Great Britain, and the Soviet Union, whereby prohibiting testing in outer space, underwater, or in the atmosphere. Another important milestone in the history of nuclear testing was the signing



of the Threshold Test Ban Treaty by the United States and the Soviet Union on July 3, 1974. Notwithstanding, "The Threshold Test Ban Treaty, which limited all nuclear tests yields to less than 150 kilotons, was not ratified by the U.S. until September 25, 1990" (Scammell, 1993).

## **APPENDIX II**

### **COMMUNITY REUSE ORGANIZATIONS**

Several of the DOE's diversification initiatives taking place at other former U.S. nuclear weapons sites are examined here as a comparison of the efforts being provided by Nevada's CRO, namely, the NTS Development Corporation.

A number of CROs have been created nationwide to assist the DOE in the post-Cold War era with the downsizing that has taken place due to the discontinuance of its weapons mission. Numerous nuclear facilities have been shut down throughout the United States. "These Community Reuse Organizations assist the DOE in transitioning from its former operations to new horizons as they search for redefined missions" [Online: <http://www.transitions/org/>]. Below are examples of the redefined roles assumed by four of these nuclear facilities: (1) the Mound Plant, (2) the Oak Ridge Reservation, (3) the Savannah River Site, and (4) the Idaho National Engineering and Environmental Laboratory.

- (1) The Mound Plant, a 306-acre site located in Miamisburg, Ohio, is the home of the DOE Ohio Field Office. The Mound Plant, established in 1946, has been regarded as one of the nation's most prestigious installations in hi-tech research, design, development, manufacturing, and testing of components for nuclear weapons [Online: <http://www.ohio.doe.gov/>].

The Mound Plant is one of the first in the nation to offer its advanced facilities, equipment, and scientific know-how to private businesses. Its current manufacturing environment provides businesses the opportunity to reduce risk, avoid overhead

costs, and maximize return on their investment while advancing their capabilities. Its current slogan reads: "Your taxes financed it, now you can take advantage"

[Online: <http://www.ohio.doe.gov/>].

The mission of this facility's CRO is to "make Mound real property, equipment, and facilities available for development as a commercial industrial site as safety, economically, and timely as possible." The Mound Plant has initiated the transitioning of several facilities, primarily by leasing facilities to the City of Miamisburg. Mound continues to work on an active shutdown program that will allow for economic development of the site [Online: <http://www.ohio.doe.gov/>]. The local reuse organization has thus far created 283 jobs and expects to create an additional 550 positions by the year 2001.

- (2) The Oak Ridge Reservation, a 35,252-acre site located in Tennessee, has led the nation in research, development, and manufacturing for more than 50 years. During WWII, this organization played a major role in the production of materials for the Manhattan Project. Now, it is being transformed into an economically viable integrated science, education, technology, and industrial complex operated in partnership with the private sector. The Community Reuse Organization of East Tennessee (CROET), a private, non-profit corporation, was created to facilitate this partnership [Online: <http://www.oakridge.doe.gov/>].

CROET's role has been to reindustrialize the Oak Ridge complex. CROET has made available this site's underutilized resources (land, facilities, equipment, personnel, and technologies) to private industry. CROET leases the federally owned properties

(approximately 200 facilities) and subleases them to private industry. The DOE cooperates in this effort by providing flexible lease arrangements. Additionally, the state of Tennessee provides incentives in the form of tax credits, exemptions, and reductions; financing incentives; and accelerated depreciation of machinery and equipment [Online: <http://www.transitions.org/>].

Reindustrialization at Oak Ridge could result in over \$800 million in savings to the taxpayer over 30 years [Online: <http://www.wct.doe.gov/>]. These savings would be achieved through bartering leasing for cleaning up contaminated buildings, utilities, roads and grounds budget reductions, and the barter of metals for cleanup of buildings.

- (3) The Savannah River Site was built during the early 1950s to produce tritium and plutonium 239 (basic materials for fabrication of nuclear weapons). This nuclear site has adjusted through the years to meet changing defense requirements. All five of its original production reactors are permanently shut down. This site currently focuses on national security work, economic development and technology transfer initiatives, and environmental and waste management activities. The complex covers 310 square miles bordering the Savannah Rives between South Carolina and Georgia [Online: <http://www.srs.gov/>].

The Savannah River Regional Diversification Initiative (SRRDI) is a non-profit organization established in 1993. Its mission is to diversify the economy by “creating an environment conducive to technology-based start-ups, business expansion, and the attraction of new ventures” [Online: <http://www.transitions.org/>].

The Small Business R&D Seed Fund for Technological Innovation is a program implemented to promote the SRRDI mission. The program provides matching awards of up to \$25,000 to support the start-up or expansion of technology-based businesses. Seed funds are awarded to enable entrepreneurs to engage in high-risk research and development projects that typically cannot be financed through conventional sources [Online: <http://www.srs.gov/>].

- (4) The Idaho National Engineering and Environmental Laboratory (INEEL), a 571,000-acre site located in southeastern Idaho, was initially established by the federal government as the National Reactor Testing Station in 1949. Its purpose was to provide an isolated location where prototype nuclear reactors could be designed, built, and tested [Online: <http://www.inel.gov/>].

By the end of FY 1998, the DOE had given \$15 million to the state of Idaho to mitigate the impacts of personnel cutbacks at the INEEL in recent years. A large part of the \$15 million was given to the Regional Development Alliance. In addition, the DOE provided the Eastern Idaho Community Reuse Organization with \$5 million. The Eastern Idaho Community Reuse Organization is a private, non-profit economic development corporation. Such funding has resulted in numerous new non-INEEL jobs in the region. Also, this CRO has achieved commercialization of this site's technologies and capabilities [Online: <http://www.inel.gov/>].

Through their collaborative efforts to reduce this community's economic dependence on the DOE, these organizations have obtained permission for Naval fuel to be transported and stored in Idaho. Such activities allow for "continued defueling and

decommissioning of Naval nuclear vessels to meet arms control commitments and  
frees Naval shipyard facilities to meet ongoing maintenance requirements”

[Online: <http://www.wct.doe.gov/>].

## APPENDIX III

### NTS DEVELOPMENT CORPORATION TIME LINE

The following time line highlights the milestones accomplished by the NTS Development Corporation since its inception.

#### March 1993

Governor Bob Miller appoints task force to develop plan of action for future of the Nevada Test Site.

#### June 1994

Nevada Economic Adjustment Task Force releases "State of Nevada Plan of Action for the Future of the Nevada Test Site and its Work Force" including recommendations for alternative uses of the NTS.

#### August 1994

DOE Nevada Operations asks Governor Miller to establish a community reuse organization (CRO) in Nevada.

#### March 1995

Governor Miller appoints 26 task force members to serve as initial CRO.

#### July 1995

\$20,000 grant received from DOE for formation of CRO.

#### July 5, 1995

The NTS Development Corporation (NTS Development Corporation) incorporates as nonprofit economic development organization, Nevada's CRO.

#### August 1995

Bylaws accepted and first officers elected: John O'Reilly, Chairman; Joe Brown, Vice Chairman; Tim Carlson, President; Troy Wade, Secretary; and Bill Andrews, Treasurer.

#### September 1995

\$500,000 grant received from DOE for CRO operations startup.

#### November 1995

CRO prospective board members tour the NTS to evaluate facilities for potential reuse.

#### February 1996

Board expands to 56 members and confirms Tim Carlson as full-time president as of March 1, 1996.

#### April 1996

The NTS Development Corporation opens its doors in Las Vegas President Tim Carlson begins staff organization.

#### June 1996

Senator Harry Reid presents \$5 million DOE grant to support the NTS Development Corporation's economic development efforts.

#### June 3, 1996

Board elects fiscal-year officers: John O'Reilly, Chairman; Joe Brown, Vice Chairman; Tim Carlson, President; Troy Wade, Secretary; and Bill Andrews, Treasurer.

#### June 3, 1996

The NTS Development Corporation signs Memorandum of Understanding (MOU) with Kistler Aerospace Corporation, enabling Kistler to pursue a launch-recovery operation at the NTS for its K-1 vehicle.

#### October 1996

The NTS Development Corporation begins work with Fluid Tech to site its cleaning and recertification activities at the NTS.

#### October 29, 1996

\$150,000 allocated to support establishment at the NTS of a statewide training center for first responders.

#### December 1996

The NTS Development Corporation begins work with displaced Bechtel graphic-design workers who plan to open a Southern Nevada business called Digital Ink Design.

#### January 1997

Digital Ink Design opens its doors and hires Bechtel displaced workers; \$240,000 (acquisition cost) of equipment excessed by DOE for this economic development purpose.

**February 1997**

DOE/NV, the NTS Development Corporation, and Kistler Aerospace agree on site in Area 18 for Kistler's Nevada operation.

**February 1997**

The NTS Development Corporation receives 501(c)(3) designation from Internal Revenue Service.

**March 1997**

\$450,000 allocated over 3-year period to NRG Technologies to support hydrogen-enriched lean-burn technologies for the automotive industry.

**March 1997**

The NTS Development Corporation begins partnership project for stationary-engine alternative-fuel application.

**March 1997**

The NTS Development Corporation's first newsletter "The Globe" published.

**March 20, 1997**

\$100,000 business-development loan allocated to Digital Ink Design.

**May 1997**

\$12,555 (acquisition cost) in computers transferred to Urban Chamber of Commerce, Las Vegas, for training program.

**May 1997**

\$33,129 (acquisition cost) in equipment \$650 (acquisition cost) in office furniture transferred to Healthworks, a wellness firm started by a Bechtel displaced worker.

**June 1997**

\$59,985 (acquisition cost) in personal property transferred to NRG Technologies.

**June 5, 1997**

AJR 16, in support of Kistler Aerospace operation at the NTS, introduced to Nevada Senate and Assembly.

**July 1997**

Resolution of support for Kistler operation introduced by Commissioner Loraine Hunt at Clark County Commission meeting.

**July 1, 1997**

\$30,000 business development loan authored to Healthworks.

**July 1, 1997**

The NTS Development Corporation publishes first annual report.

**July 14, 1997**

\$30,000 business-development loan allocated to Healthworks.

**July 15, 1997**

The NTS Development Corporation and Clark County sign MOU to cooperate and partner on projects of mutual benefit.

**July 22, 1997**

Board elects fiscal-year officers: John O'Reilly, Chairman; Joe Brown, Vice Chairman; Tim Carlson, President; Troy Wade, Secretary; and Steve Comer, Treasurer.

**July 22, 1997**

Board allocates \$198,400 for Nevada Science and Technology Corridor, an industrial park partnership for rural Nevada.

**August 18, 1997**

General use permit between the DOE and the NTS Development Corporation for aerospace activities signed by Secretary of Energy Federico Peña.

**October 1997**

\$87,000 (acquisition cost) in excess equipment transferred to the Town of Pahrump for economic development activities.

**October 1997**

\$333,500 allocated to HELB program/alternative-fuel stationary-engine development.

**October 2, 1997**

MOU signed by the NTS Development Corporation, the DOE, and Las Vegas Motor Speedway for testing and demonstration of alternative-fuel vehicles.

**November 1997**

\$210,000 (acquisition cost) in personal property transferred to Rocky Research for expanding analytical testing services in Southern Nevada.

**November 1997**

The NTS Development Corporation participates as major sponsor in Governor's Conference on Economic Development, Las Vegas, Nevada.

**January 1998**

The NTS Development Corporation and Fluid Tech sign subpermit to occupy EMAD facility at the NTS.



**January 1998**

\$145,000 allocated for study to develop master plan for commercial use of Desert Rock Airport adjacent to the NTS.

**February 1998**

Fluid Tech occupies EMAD facility at the NTS.

**February 1, 1998**

The NTS Development Corporation and Epic Productions begin planning for The Global Energy Futures Exchange (GlobeEx) in Las Vegas, October 1998.

**March 1998**

Board allocates \$243,000 for feasibility study and development of financial plan for the Nevada Science and Technology Center, an interactive demonstration facility to promote science and technology.

**March 1998**

\$20,000 (acquisition cost) in excess property transferred to Fluid Tech for its NTS operation.

**March 1, 1998**

\$424,918 (acquisition cost) in property transferred to Carbon Regeneration Facility, Inc. (CRF) in preparation for Nevada business operation and potential siting at Desert Rock Sky Park.

**April 1998**

The NTS Development Corporation partners with Oak Ridge National Laboratory and signs MOU to commercialize new technologies developed at the lab.

**May 1998**

Executive Committee allocates \$110,000 for the Lincoln County Partnership for industrial park development.

**May 1998**

The NTS Development Corporation publishes second annual report.

**May 18, 1998**

\$340,000 allocated for Stage 2 funding of the Nevada Science and Technology Corridor.

**May 18, 1998**

Board adopts Strategic Plan for the NTS Development Corporation.

**May 18, 1998**

Board elects fiscal-year officers: John O'Reilly, Chairman; Joe Brown, Vice Chairman; Tim Carlson, President; Troy Wade, Secretary; and Steve Comer, Treasurer.

**May 18, 1998**

The NTS Development Corporation receives \$5 million funding commitment from DOE, announced in March by Senator Harry Reid, for continued economic development activities.

**June 4, 1998**

The NTS Development Corporation, Bechtel Nevada, and DOE offer pilot courses on weapons-of-mass-destruction training at the NTS.

**July 1998**

\$163,406 (acquisition cost) in personal property transferred to Rocky Research for expansion of analytical services.

**July 1998**

\$161,220 (acquisition cost) in personal property transferred to Fluid Tech for its NTS operation.

**July 1998**

\$1,048,044 (acquisition cost) in personal property transferred to CRF for its potential NTS operation.

**August 26, 1998**

Senator Reid announces passage in the U.S. Senate of the Commercial Space Act, which authorizes FAA to license reentry.

**October 5, 1998**

The NTS Development Corporation's offices move to new location within Las Vegas.

**October 8, 1998**

President Clinton signs Commercial Space Act, which facilitates Kistler project at the NTS.

**October 26, 1998**

GlobeEx 3-day conference begins; Secretary of Energy Bill Richardson, Senator Harry Reid, Senator Richard Bryan, and Governor Bob Miller participate.

**October 26, 1998**

The NTS Development Corporation, Clark County, and Oak Ridge National Laboratory sign agreement to site Triple Effects Chiller Demonstration at Clark County Government Center.

**November 1998**

The NTS Development Corporation supports the NTS History Foundation through donation of office space.

**December 1998**

The NTS Development Corporation and Kistler Aerospace sign subpermit to facilitate siting at the NTS.

**December 1998**

The NTS Development Corporation supports Nevada Assembly Bill 979, Regional Development Act.

**December 10, 1998**

Desert Rock Sky Park receives Site Use Development Board approval.

**2001**

Anticipated first launch from SPACEPORT NEVADA by Kistler Aerospace.

**Source: NTS Development Corporation Brochure, 1999**

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